OPERATIONALIZING THE LANGUAGE OF PHOTOGRAPHY FOR EFFECTIVE STORYTELLING

ABSTRACT

With photography's center of gravity shifting from mechanical production to meaning-making, it is essential to understand the language of photography, its direct influence on visual storytelling and the impact it has on the tools.

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for Effective Storytelling

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covers camera operation in terms of language and covers dialect in terms of their fundamental aspects, allowing students to develop projects on the instruction rather than having them imposed, giving them ownership of learning.

Storytelling

The fundamental thread of the shift from mechanical image making to ambient presence is storytelling. The photographer recognizes the story and, whether a single photograph with caption or a complete story with introductory essay, a complete photo series and extensive captioning, the principles of storytelling remain consistent. They always revolve around telling the subject's story and realizing that the storytelling is the art.

Application

The computational photography system in the smartphone camera is designed to produce a fully formed photograph that is ready for immediate use. This requires changes to what has become the "standard" photographic workflow and significantly impacts both the software and the equipment needed for post-processing. Working together, these changes make the smartphone camera as perfect an instrument for storytelling as photography has yet produced.

If Past Is Prologue - Disrupting our way to the future

The two most disruptive cameras in the history of photography are the original Apple iPhone (2007) and the Kodak Brownie camera (1900) which fundamentally altered photography's center of gravity.

When the wet plate photography process, Kodak's Brownie camera and Apple's iPhone were introduced each fundamentally and broadly disrupted photography's accepted sensibilities and sent it on a course moving through industrialization, democratization, normalization and finally to integration, permanently changing both the medium and our understanding of it.

Frederick Scott Archer published his wet plate collodion photography process in 1851 and, in the three years that followed, a complete photography infrastructure with equipment manufacturers, itinerant photographers, studio photographers, chemical suppliers, retailers, and even commercial labs developed. Although concentrated in major metropolitan centers, photographers in smaller towns and rural areas were served by a burgeoning catalog system that could deliver anything needed.

The wet plate's impact was instant, global and endured for more than 150 years, through an extensive and well-organized infrastructure. Archer's process disrupted the very core

of photography, producing significantly sharper photographs than the paper-based calotype process.

A further disruptive impact of the wet plate process was its reproducibility.

Photography was no longer a “one-and-done deal” like the metal-plate daguerreotypes or fading-prone calotypes. Although the glass plate had to stay “wet” during exposure and processing, the negative, once dried, was permanent. A lab technician could make as many prints as the customer wanted, now or at some point in an undefined future. The prints could be made quickly and economically.

Archer’s wet plate process opened photography to a variety of uses… (these are in no particular order and this list is certainly not complete!) Tiny prints of loved ones were placed in lockets, brooches, and on memorial cards. People handed out calling cards with small photos pasted on. Early photojournalists sold prints of wars and public events. Businesses started using photos in advertising and promotion. Tourists bought photo albums of visited scenes and landmarks to take home with them. Doctors and scientists photographed patient conditions and experiments. Archaeologists and anthropologists documented their work. Engineers used photos to track construction. Some photographers delved into fine art. Families commissioned postmortem portraits as keepsakes.

In short, Archer’s wet plate process allowed photography to evolve into a tool of science, commerce, education, art and mass communication.

All went swimmingly… until 1900.

In February of that year Kodak released the Brownie camera and greatly expanded the photographic infrastructure.

The Brownie was a marvel of minimal design. At just three inches square by five inches deep it fit well, even in a child’s hands. It was equally light weight, tipping the scales at just 10 ounces. It had no controls of any kind save a lever to operate the shutter and a pull-out switch to allow for time exposure. Users could load and unload rolls of six-exposure #117 film themselves. The camera had a simple lens structure and a simple rotary shutter. There was no built-in viewfinder, although one could be bought and clipped on.

When Kodak designed the camera, it was originally intended for children. Not long after its release Kodak discovered adults were buying it for use as a family camera. Marketing changed and the Brownie camera became a popular household staple.

There were several precursors to the Brownie.

The conceptual precursor was the 1883 Schmid “Detective Camera” which proved there was a market for a portable, “inconspicuous” camera that didn't need a tripod. It defined the very essence and concept of the "hand camera."

Kodak’s first attempt at producing a “hand camera” was the 1886 Eastman-Cossitt “Detective Camera” which was a commercial failure, being far too complicated for most people to operate.

While it is impossible to say with certainty whether this photograph was taken using a Brownie camera, it is representative of the photographic quality available during the early "Brownie era".

This was followed by the 1888 Kodak camera which was much simpler to operate. The camera, which had limited success, was far too expensive for mass appeal.

The Brownie followed. It was designed to be a point and shoot camera that would be as inexpensive as possible. And it was. The whole camera cost $1.00. A six-exposure roll of film ran 17¢ and processing the six exposures cost 25¢. The camera sold like hotcakes.

The Kodak and Brownie cameras are generally credited with "democratizing" photography simply by their reach but it was the Brownie that normalized photography as a family and personal activity.

Mom and Dad could now take pictures of Junior or Sis's eighth birthday, take the film to the local processor – generally the local camera store – and have all the prints needed for family members who weren't able to attend. They could take their own photos of the places where they vacationed and take the rolls of film to the camera store when they returned home. They could take their own photos of family gatherings, take the film to the camera store for processing, and have prints made for family members as a remembrance.

Photography became an intimate and personal activity with seemingly unending uses, fostering a growing visual literacy and visual culture.

Another area of major impact was the hobbyist market where the photographer could shoot his or her photographs and then process and print the exposures themselves. This

ability was a major factor in partially collapsing the barrier between the professional and amateur photographer.

Very quickly, the Brownie camera became ubiquitous as did the numerous derivations that followed from Kodak and other manufacturers.

All went swimmingly… until 2007.

At about 10:28 AM on Jan. 9, 2007, during his keynote address at the annual Macworld Conference & Expo in San Francisco, Apple's Steve Jobs began the process of dismantling 152 years of photography infrastructure with just sixteen words - "These are not three separate devices. This is one device. And we are calling it iPhone."

With Jobs's announcement the camera went from being a useful and well-used imaging appliance to an instrument of instant communication, ubiquitous documentation and for many, a tool of absolute daily necessity.

While the Brownie promised to put photography in the hands of the masses, the iPhone made it happen in a way that was never imagined in 1900. The iPhone was not simply a new camera; it was a totally new approach to the practice of photography for the majority of people.

In all fairness, the original iPhone camera was nothing to write home about. It was a basic point and shoot… the 2007 version of the Brownie.

The camera was a fixed focal length and fixed-focus system with a minimum focusing distance of about two feet. It featured a 2-megapixel sensor behind a 4-element lens, a fixed f/2.8 aperture with shutter speeds ranging from 1/15 to 1/1000 of a second. There was no autofocus, no flash, no video and no manual control of any kind.

The processing software was a rigid, preset pipeline. All the color balance, tonal mapping, and sharpening were baked in with rudimentary algorithms and applied automatically and in a fixed order. In good lighting, results were comparable to entry-level compact cameras. In lower light, however, performance dropped off a bit - noise increased, some detail was lost and tonal range narrowed.

But the iPhone camera didn't have to be great in pure photographic terms. It needed to be always on, always with you, always ready and "*be good enough*".

The capstone of iPhone's disruption was connectivity. Having photographs on your phone was one thing but being able to get them to other people without using another device was the key.

There were three ways to transfer photographs from the original iPhone.

First, the user could move photographs by direct connection. Plug the phone into a computer using the supplied cable, and the device would appear as an external drive. From there, photos could be moved into folders or imported via iPhoto (Mac) or Windows Explorer. This was tactile and reliable but certainly not the connectivity Apple advertised.

Second, users could sync the phone to their computer using iTunes. This worked with either a Mac or a Windows machine. Photos could be uploaded from the phone to the

iTunes library and then downloaded to the computer. It was technically wireless transfer but again, not quite the seamless experience Apple had promised.

Third, and most disruptive, was connectivity using email. From the phone itself, users could send photographs to anyone with an email address. Granted, only one photo could be sent at a time, and the EDGE network was slow, but this was a first. The iPhone collapsed the distance between exposure and communication. A popular refrain from the time captured the advertised magic… "*sending a photo from an iPhone is as simple as sending a thought*".

In this element of Apple's disruption, the iPhone didn't just change the *tools*, it changed the *custom and practice*. The photograph became a message and the camera became a communicator. The Brownie disrupted the who of photography, democratizing who could afford it, who could do it and who got to be seen. The iPhone continued the Brownie's legacy but also disrupted the why. No longer was photography about preserving memory or crafting art. It became a language of presence, proof, and participation. A meal, a wedding, a sunset, holding hands, a new car, the waves lapping the beach… anything from the most trivial to the most significant was an open subject for someone with an iPhone.

A daylight photograph taken with an original iPhone camera on 10/28/2025. This photograph falls well within the bounds of "good enough" and demonstrates the enduring functionality of the 2007 hardware.

The camera became a node in a network with the photographer as the creator, sysop and transmitter. It was this integration of camera and phone that was the ultimate disruption.

The infrastructure that supported the making of images was now irrelevant to many. In its place was a new ecosystem that ultimately led to cloud storage, social feeds, algorithmic curation, neural processing and, for some, the adulation of likes and shares.

The iPhone's impact was immediate, far reaching and seemed truly disruptive at the time. No one realized how extensive it would become in a comparatively slow build over the next 12 to 15 years.

In the twenty-four months after Jobs's announcement, the smartphone camera market exploded. Google's Android operating system was adopted by the majority of smartphone manufacturers and nearly all smartphones featured cameras ranging from 2mp to 5mp. Some were already offering autofocus and flash.

By 2013, six years after Jobs's announcement, the dominance of smartphone cameras was clear. Industry data showed smartphones accounted for the majority of consumer

A normal-room-light photograph taken with an original iPhone camera on 10/28/2025. While there is considerable noise, softening of sharpness and reduced contrast in the photograph, it falls within the bounds of "good enough" for many.

photography and compact camera sales began a steep decline. While exact numbers varied widely by source, this is generally accepted as the definitive crossover period.

The first “uncontested-hard-data” tipping point in the smartphone camera’s photographic disruption came in 2016 when information from a variety of sources including photo-sharing platforms like Flickr showed smartphones had become the most-used device for uploaded images, surpassing both dSLR and compact cameras. Smartphone cameras represented 50% of all photographs taken. Traditional cameras accounted for 45%. Other imaging sources represented the remaining 5%.

By 2022, 15 years after Jobs made the fateful announcement, the disruption of the traditional photography infrastructure was clear and irreversible. Smartphone cameras were used for making 85% of all photographs worldwide. Discrete cameras were used for 10% of the photographs made while other sources held firm at 5%.

And still, photo quality was never the prime determinant. From the original iPhone camera on, your “phone” was always with you and it was always on. It was simple to operate. Pull it out of your pocket or purse, open the camera app, tap the shutter button and you have a “good enough” photograph. No waiting for it to start like with a traditional camera, no meters to read, no histograms to adjust, no dials to twirl, no rings to twist, no levers to flip.

As the cameras grew in capability, with advanced image processing and multiple cameras of differing focal lengths, by 2018 the photographic quality grew from “good enough” to exceptional and then, a few years later, to world class.

By 2022 the smartphone camera became integral to modern life. It was no longer simply an imaging device - it was a universally accepted cultural implement that became an essential. With the smartphone camera, photography became a universal visual language with all of the implications that brings. What began as a disruption in 2007 became the norm 15 years later and continues so to this date.

The wet plate process, the Brownie camera and the iPhone are the three disruptions that forever changed photography. Of these, the iPhone is the most serious, precisely because the infrastructure built around the wet plate and the Brownie had become so deeply entrenched.

Some would argue the shift to digital photography was as disruptive as anything else. That claim might have some traction but not for long as digital’s impact was more grandly evolutionary than revolutionary. This shift replaced film with the digital sensor and related electronics but that is all that fundamentally changed. The core infrastructure is still intact. We still have the suppliers and retailers; we still have all of the user-adjustable camera settings from the film era and we’ve even added a few more. Software, with all of the available presets and tunings, replaced the commercial lab but the big-box photo centers thrived. Studios persist and there are still itinerant photographers. We even call the preferred digital format “the digital negative”. And most importantly to the preservation of the infrastructure of the traditional digital realm, we still need multiple devices to ultimately produce a usable photograph.

To predict where this disruption will ultimately lead would be astonishingly presumptuous but…

The one thing overwhelmingly clear since that fateful day in 2007 when the iPhone launched is that the photography universe has been organically dividing into two distinct realms, traditional photography and smartphone photography.

The traditional photographic infrastructure continues to pursue photographic purity in a number of ways… being able to select the right camera body for a specific genre, being able to select the right lens for a specific subject, having the "correct" filter to adjust the tone or exposure of the image, having the most advanced software package to process the camera raw file. All of this hardware is geared to producing the "perfect" photograph while "working within everyone's budget".

The infrastructure continues to produce "training" materials in social media posts, public-facing photography blogs and photographer's websites advocating traditional manual exposure control and learning the variety of in-camera tools used in that process.

And then there are the never-ending accessories, the tripods and monopods, the flash units, the lights, the modifiers, the bags and cases, the straps, and more… ad infinitum, ad nauseam.

The evolutionary versus revolutionary reality is quite different in the software realm as the infrastructure continues to rely on software developers to "step up the game" both in-camera, continuing to add user-initiated options to the increasingly complex menu structures, and in the software used for processing the once unloaded camera raw files.

"Training" materials advocate the use of a variety of tools in software packages to compensate for deficiencies in composition, exposure or color balance, AI assisted masks, gradients, object removal, etc. And then there are the AI assisted culling packages. This does not begin to address the fledgling designs including generative processing for everything from sky replacement to adding or moving objects in the frame.

Beyond the hardware and software of the traditional infrastructure is the traditional ritual associated with photography. It may be developing the "shot list" either on paper or simply as a thought process. Next is figuring out what equipment is going to be required for "the shoot", checking the batteries and the media cards and then loading it all in the camera bag and making sure the "just in case" stuff is there.

Or it could be as simple as picking up the camera, checking the battery and media card and putting it in the small belt case.

After either, the next part of the ritual is heading out. Afterward there are the rituals of unloading the files, culling for the best shots and then processing the photographs.

All of this in the name of photographic purity.

Smartphone photography moves beyond the confines of the traditional photography infrastructure, creating something far more complex and almost organic - smartphone photography is defined by its ecosystem.

In sharp contrast to traditional photography's infrastructure with its expansive multiple independent nodes, smartphone photography is a compact vertical ecosystem that

compresses exposure, processing, formatting, output and distribution into a single device that gives the user a perfectly finished photograph ready for any application.

There is no pause between exposure and circulation. The steps are no longer sequential but simultaneous meaning the seams and the friction that once defined photographic practice are gone.

The seams that existed in traditional photography have been largely removed. There is no more transferring the photograph from one device to another. In the smartphone system the photograph is exposed, published, archived, and ready to distribute practically instantaneously.

This seamlessness is part of the disruption dating from the original iPhone and it changes the very nature of photographic practice from when it had visible joints. The traditional practice involved the careful exposure of the scene, the editing, the posting and the printing. Now all of those joints are handled in the device's ecosystem which is why the vast majority of smartphone photographs are produced using the standard "Photo" app and touch screen biasing. The technical aspects of creating the photograph now seem effortless.

The frictionless aspect of smartphone photography functions at two separate but complementary levels shifting photography's cultural role from that of a specialized craft to a universal language.

The first friction elimination point being at the device level. With the release of such smartphones as the iPhone 13 Pro/Pro Max, the Google Pixel 6 Pro, the Samsung Galaxy s21 Ultra and the Sony Xperia 1 III the smartphone became a complete photography platform unto itself in the vast majority of photographic uses. There were no other devices needed for these cameras to function well.

Various manufacturers have tried to accessorize smartphone cameras with everything from third party photo apps through continuously burning LED light panels to ergonomic handles and accessory lenses. This is an attempt to draw smartphone photography into the traditional horizontal infrastructure. Aside from a basic protective case, the vast majority of smartphone cameras are not accessorized.

And the answer is really astonishingly obvious… the vast majority of users want to be able to simply "pull the phone out and take the picture" and in that regard, the pure, plain, unadorned smartphone camera is the most capable.

The second part of the smartphone camera eliminating photographic friction is in its integration into everyday life. The camera is no longer a discrete device and the photographs are no longer discrete artifacts. The act of photographing is a seamless extension of gesture that both allows and encourages instantaneous communication.

With no frictional resistance between intention and output and then between output and distribution, photography is now more about the narrative and the presence. It is about immediacy.

But this shift to immediacy does not preclude intention in any way. The photographer continues to be the one deciding on the intention of the photograph. This can be the immediacy of the moment or the rendering of the long-studied scene. The smartphone camera makes both equally available. Immediacy no longer excludes intention… it

simply relocates it, front loading the process. The photographer's choices shift from managing technical thresholds to shaping narrative presence.

The combined collapse of the seams and elimination of friction is not just a technical disruption but one of understanding as well, forcing us to consider whether photography should be preserved as a heritage craft, be embraced as a hybrid practice, or moved forward into post-disciplinary storytelling.

The Shift, pt. 1 - Photography's center of gravity shift forever ruptures traditional infrastructure

In all of the discussions, editorials, commentaries, product reviews and technique tutorials that have been written over the past few years (as of this writing), the one issue that is rarely acknowledged is the profound shift in photography's center of gravity. Perhaps the issue is unrecognized or perhaps it is simply being ignored but the reality is it started relatively slowly in 2016-2017, began accelerating just a year or two later and by 2021 the rupture of the traditional infrastructure was locked in place.

Before 2016-2017 photography's center of gravity was defined by apparatus and processing in an infrastructure that was based on maintaining a certain amount of friction between the various independent nodes in the process.

By 2021 the friction had been reduced somewhat but it was still a significant component of the infrastructure.

It was that same year that photography's center of gravity moved completely out of the node-based infrastructure and became a unified, ambient, integration-centric, computational-based ecosystem that largely removed the friction. The smartphone camera and the culture it brought became the center of gravity. No add-ons. No accessories. No bags. Just the camera in a phone. Plain and simple.

The fundamental question is why?

(Author's note -- To make sure we are all on the same page here, when we are talking about photography's center of gravity we are talking about the way the majority of people take photographs in any particular period and the photographic culture that springs from that majority. By most estimates approximately 94% of all photographs worldwide are now made using a smartphone camera.)

Prior to 2016, photography lived in the camera and the photograph was, in reality, simply the byproduct of using the camera. Discussions centered on all the marvelous things the camera could do, all of the buttons to push, levers to flip, rings to turn, and, oh-by-the-way, the pictures were pretty good too. All of the various accessories were contributors to this process.

Collectively, these steps constituted the workflow friction that defined traditional practice.

The friction is still there. Selecting the camera body, setting the ISO, selecting the lens, setting the aperture, setting the shutter speed, selecting the focus mode, making sure the

output is set to the raw format of the camera manufacturer… each step introduces procedural drag

Then there is the flash unit… the tripod… the filters. And for the technically adventurous, there is tethering to the laptop.

And then, after the capture there is unloading the media card, inserting it in the card reader, navigating to the particular image, opening it in the processing software. Selecting the sliders, levers and switches to make the adjustments. There is making sure the whole process is in pursuit of image perfection.

After all of this, there is the printing… test prints followed by proof prints and then the final print. If the photograph is destined for the internet, there is a whole different processing requirement.

The entire process is as much friction as anything else.

Life holds less friction for the casual photographer but it is still there even if the camera is run fully on automatic. The card still has to be removed from the camera and put into the card reader. Then it's navigating to the particular image, opening it in the processing software. Selecting the sliders, levers and switches for the adjustments… making sure all of the process is in pursuit of image perfection. The photograph is printed and the print is evaluated to see if it's "good". If the photograph is destined for the internet there is a whole different processing and then it's uploaded.

Less friction, but friction none-the-less.

Beginning in 2007 all of the preceding became irrelevant. The iPhone collapsed the entire friction-laden, node-heavy, infrastructure-based process into a single gesture.

The iPhone and its associated revolution didn't spring to life from a vacuum. In the five years leading to the release of the iPhone, fully automatic compact digital cameras dominated the market by orders of magnitude. These cameras eliminated a significant amount of friction but the distribution element, getting the photograph to others, was still a major concern. The photograph either had to be imported into a computer and emailed to recipients or it had to be printed at a local photo processor and "snail mailed". Both significant points of friction.

By combining the camera with the capability to send a photograph anywhere in the world using an onboard email client via the internet, the iPhone and similar smartphone systems collapsed the entire process into a single friction-free device and process. The smartphone was now an integrated ecosystem offering capture, processing, distribution and archiving in a single gesture.

Granted, the cameras were not exceptional, low light response was a problem and the distribution was slow but the ecosystem met the consumer's need for availability, convenience and connectivity, something manufacturers in the traditional infrastructure were (and still are, it seems) unable to do.

It should be noted here that Apple was not the first manufacturer to offer a camera-phone product; it was simply the first company to introduce such a device into an already established ecosystem — and, most importantly, to a large, intact, and deeply committed fan base.

By 2017 smartphone camera systems had improved dramatically. Camera hardware improved drastically, software matured, the low light barrier was breached and fledgling portrait and night modes were introduced. With all of the improvements, the smartphone camera became the worldwide photographic instrument of choice with availability, convenience and connectivity still the driving factors.

By 2021 the drivers of 2017 (availability, convenience and connectivity) were the assumed defaults and the quality of the photograph became the differentiating factor. Bluntly, the quality of the smartphone output had gone from "good enough" pushing good (2007 - 2017) to good pushing exceptional (2017 – 2021) and then to exceptional and now world class (2021 – present). As the output quality improved, so did the availability and convenience. Users can text a photograph in seconds… they can send a photograph by email… they can concurrently send the photograph to their social media and photo sharing sites… they can concurrently send the photograph to their cloud-based archive. All seamlessly from a single device. A convenience package traditional camera manufacturers are still unable to provide (as of this writing).

All of this points to the rupture in the traditional infrastructure that has produced a widening divergence, and with it, a definable change in the culture of photography itself.

In the traditional infrastructure, photography is an event. The act requires preparation. There is selecting a camera (a device separate from the phone), checking the media card, confirming there is space, charging batteries and packing extras, and, perhaps most importantly, remembering to bring the camera at all. After the exposure, the photographer must unload the card, transfer the files, process them, and then distribute them through email or social media. The event is discrete, intentional, and bounded by friction at every stage.

The smartphone dissolved that event structure. It moved photography from event to ambiance and seamless integration. The phone is already with us. There is nothing to retrieve. There is nothing to prepare. If the battery dies, the phone dies so users keep it charged. Photography is ambient, continuous, and woven into the flow of daily life rather than carved out as a separate activity.

But the deepest cultural shift is that the smartphone camera has moved us from image-making to meaning-making**.**

In the infrastructure era, photography was primarily an expression of aesthetics, a crafted image produced through a technical ritual (and it and remains ritualized).

In the smartphone era, the question is no longer "How do I make this picture?" but "What do I want to say?" The photograph is a communicative gesture, a unit of meaning, a message embedded in the everyday. The camera is no longer a tool for making images, it is a tool for making statements.

The cultural side of the shift in gravity has shown photography to be a language in and of itself. This is a language based in objects and context which combine to become statements. This capacity allows us to "show" in real terms and "tell" in real context. Thus, the photograph is no longer an object in and of itself but a communicative document that can be quickly shared with others. A few examples --

-- “The red car parked on the city street” – we now know exactly what shade of red. We know if the street is a traffic-packed main thoroughfare, a commercial-area side street or a residential street.

-- “The overgrown landscaping” – we now know exactly how overgrown it is. We can see how the landscaping is blocking a sidewalk, growing onto the porch or starting to attach itself to the walls of the building.

-- “The intricate sand castle” – we now know exactly the level of intricacy and detail the builder put into the construction. We know where it was built. If there are people around the castle, we will get a sense of the scale the builder used. We can also infer the amount of time, effort and skill it took to create the castle.

This is a cultural shift of enormous proportion and photography’s communicative capacity only expands when positioned in combination with text.

And because of the smartphone camera’s now world-class image quality in combination with the default functions of availability, convenience and connectivity, photography’s center of gravity is now permanently and completely outside of the traditional infrastructure and shows no signs of returning. This is not to say that the traditional infrastructure is not important to photography, but it is no longer the center of gravity and it appears that the divergence is only expanding.

The reality is that smartphone camera systems now dominate both photographic production and culture, eclipsing the traditional camera infrastructure across technical, cultural, and workflow dimensions, shaping how the vast majority of photographs are captured, processed, and circulated.

The Shift, pt. 2 - Computational photography reboots the medium’s basics

The computational photography rupture is most often invoked obliquely rather than examined directly. When it *is* examined, it is framed through comparison with the traditional, nodal photographic infrastructure and treated primarily as a matter of hardware evolution. Both moves obscure the rupture rather than clarify it.

Traditional photography operates through a structured process, moving from intention through preparation and execution to refinement, yielding a finished photograph as the terminal outcome of that process. Computational photography follows a far more inferential and less scripted progression, moving from perception through attunement to recognition and finally to articulation.

At its core, the traditional photographic infrastructure is oriented toward the photograph as a fixed product, while in the computational ecosystem the photograph is oriented toward making a statement.

Because computational photography is ambient rather than episodic, the initiating condition of the photographic act shifts from a pre-formed, structural intention to a state of ongoing perception. The camera is no longer an appliance awaiting activation in service of a prior plan; it is already present, already sensing and already participating in

the unfolding of the scene. What follows is less the execution of a predetermined intention and more the recognition of significance, with articulation becoming the moment in which meaning is asserted rather than merely recorded.

This shift from intention to perception fundamentally alters every other aspect of what has historically been termed the “photographic process”.

The rules, guidelines, and prescriptions that govern composition in traditional photography lose their organizing role in computational photography. Composition is no longer an anticipatory act imposed upon the scene but an emergent condition revealed through increasing attunement to what is unfolding. As attunement both deepens and refines, the scene presents its own spatial and semantic structure, becoming what might be best described as a *discovered presence*. The photograph is not composed so much as recognized, with articulation asserting what the scene has already disclosed. This is not a form of photographic mysticism, but an acceptance of the scene as it exists and a translation of that presence into a coherent statement.

Just as composition is no longer an anticipatory act imposed on the scene, neither are exposure or focus. These are now continuously handled and optimized by the system unless intentionally biased by the photographer. Even when biased, the system makes its best effort to accommodate the user’s intervention in terms of the overall scene.

Exposure and focus cease to function as technical decisions for photographers, becoming components of the semantic interpretation of the scene. They are determined by what must be preserved, emphasized, or subordinated in service of the articulation.

With articulation asserting a coherent statement, meaning is no longer constructed through technical control but recognized through semantic relationships within the scene.

In a single photograph, meaning emerges from the noticed and articulated relationships between elements. This is from the discovered presence itself rather than from formal orchestration. In a photographic sequence, meaning emerges not only from the discovered presence within each photograph but from the relational tension and continuity between them.

Meaning in computational photography is therefore recognition-driven rather than craft-driven. This shift has profound consequences for sequencing, editing, captioning, and narrative structure, all of which move away from formal cohesion and toward semantic coherence. The photographer’s role is no longer to construct meaning through technical mastery, but to recognize, articulate, and sustain meaning. This shift also reconfigures preparation, relocating it from gear configuration to contextual orientation.

(Author’s note - In this context editing refers to the selection, sequencing, and contextual framing of photographs for a book, photographic sequence, or online presentation, including writing and editing captions. What is commonly referred to elsewhere as photo editing is referred to here as adjustment.)

In traditional photography, photographic adjustment is undertaken in pursuit of image refinement and technical completion. The initial file or “digital negative” is understood as an intermediate state, requiring a series of corrective and enhancing interventions,

often using multiple tools, arriving at a finished photograph that meets established standards.

In computational photography, adjustment serves a fundamentally different role. The image is already technically coherent at capture, with the system having inferred and optimized for exposure, focus, tonal relationships, etc., in real time. Adjustment therefore functions not as technical completion but as semantic clarification — refining what has been recognized in order to strengthen articulation.

This transforms adjustment from a craft act aimed at image perfection to a *speech act aimed at communicative precision*.

While the preceding sections have examined the mechanics and depth of the computational rupture, its most consequential impact is on photographic skill and the role of the photographer.

Photographic skill shifts from the mechanics of technical control to forms of perceptual literacy. The photograph is no longer primarily fabricated through a sequence of controlled operations, but recognized through attentive engagement with the unfolding scene. This shift applies across nearly all photographic genres, though its implications manifest differently in each. Because the computational ecosystem produces a technically resolved and coherent photograph at the moment of capture, post-processing skills are reconfigured away from correction and toward clarification — refining recognition where necessary rather than rescuing technical insufficiency.

Consequently, the role of the photographer shifts from image maker to attentive interpreter who "listens" to the scene, recognizes what is being disclosed, and frames that recognition through articulation. This shift fundamentally alters photographic agency and responsibility, redefining the photographer's relationship to the scene, the subject, and the resulting image.

Computational photography introduces a form of distributed agency without distributed authorship. While the system participates in recognition and preservation, authorship remains wholly located in articulation — the moment when a person asserts a claim about the world and assumes responsibility for that claim.

Within this distributed system, the photographer recognizes the scene and establishes the framing. Concurrently, the system infers salience and relevance within the scene based on its learned models and reference imagery, resolving technical concerns such as exposure, focus, and multi-frame operations including HDR, noise reduction, and tone mapping. The system preserves elements it predicts to be significant, but does not — and more importantly, cannot — assert meaning.

Prior to articulation, what exists is not yet a photograph but a data stream. It is interpreted, optimized, and preserved, but not claimed. The photograph comes into being when the photographer commits to it by tapping the shutter, asserting meaning through articulation, and assuming ethical and communicative responsibility for the resulting image.

In this configuration, responsibility remains singular even as agency is distributed. The system manages technical operations, even when biased by the photographer through

gestures such as screen taps, while the photographer alone assumes responsibility and thereby authorship of what the photograph claims about the world.

It should be noted that while computational systems are often described as performing "semantic" analysis, their operations are more accurately and technically understood as salience-driven categorization in service of technical optimization rather than meaning-making.

What follows is not a discussion of improved technique, but an examination of how genre itself is reconstituted once perception, attunement, and articulation replace preparation and execution.

Portrait Photography: From constructed likeness to preserved salience

In traditional portraiture, the central problem was the construction of conditions under which likeness could be reliably produced. Lighting ratios, lens choice, background separation, and post-processing workflows were all instrumental mechanisms designed to stabilize the subject against environmental variability. The photographer's craft lay in anticipating how these variables would interact at the moment of exposure and constraining them in advance.

Computational portraiture inverts this relationship. Rather than constructing conditions for the subject, the system continuously models the subject within whatever conditions are present. Face detection, depth estimation, and subject isolation do not function as stylistic tools but as perceptual commitments. The system's salience-driven categorization prioritizes the subject. Backgrounds become negotiable, lighting becomes interpretable, and location loses its status as a limiting factor. As a result, post-processing also ceases to be a separate stage of refinement.

The articulation of the subject is performed inline, as part of the act of capture itself. Portrait photography shifts from an exercise in environmental control to one of salience preservation, where the image asserts who the subject is rather than how carefully the photograph was made.

Landscape Photography: From interpretive exposure to perceptual stabilization

Landscape photography has historically been defined by its adversarial relationship with light. Dynamic range exceeded the recording capacity of the medium, forcing photographers to make interpretive sacrifices through exposure choice, filtration, and later, post-production. Systems such as the Zone System formalized this negotiation, offering a structured way to translate a perceptual experience into a materially constrained output.

Computational landscape photography dissolves all of this negotiation by reconstructing the scene rather than sampling it. Multiple exposures, temporal averaging, and probabilistic inference allow the system to stabilize highlight and shadow detail simultaneously—not as an aesthetic choice, but as an assertion of perceptual completeness. Tone mapping becomes less an expressive act than a normalization

process, aligning the rendered image with how the scene was experienced rather than how it could be exposed.

Landscape images no longer announce the photographer's mastery over light but instead present the landscape as perceptually resolved. The photograph moves from being a crafted translation to a stabilized perceptual claim.

Street Photography: From the decisive moment to continuous readiness

Street photography has long stressed immediacy, reflex, and situational awareness. The "decisive moment" presupposes a photographer whose perceptual attunement and motor response converge at precisely the right instant. Technical mastery served this goal by minimizing friction between perception and capture.

Computational systems alter this dynamic by embedding readiness into the apparatus itself. Continuous autofocus, exposure adaptation, subject detection, and pre-capture buffering transform the camera into an always-on perceptual system. The photographer's role shifts from reacting to events to remaining attuned to unfolding situations while the system handles micro-adjustments in real time.

This does not eliminate judgment, but relocates it. Selection and articulation move downstream, while the act of capture becomes less about timing precision and more about perceptual alignment. The decisive moment is no longer seized; it is recognized.

Macro Photography: From mechanical precision to proximity recognition

Macro photography traditionally demanded strict control over focus, stability, and depth of field. The extreme constraints of scale required elaborate setups, incremental adjustments, and often composite techniques such as focus stacking. Success was measured by technical excellence as much as by subject matter.

Computational macro photography removes many of these constraints by reconstructing depth and detail across multiple frames or focal planes automatically. Focus ceases to be a fragile, binary condition and becomes a resolved field. What once required careful preparation and procedural discipline is now achieved through proximity and recognition.

This shift reframes macro photography as an exploratory act rather than a technical one. The photographer is no longer bound to predetermined setups but can engage in opportunistic discovery. The image articulates the presence of detail rather than the precision of its execution.

Product Photography: From staged production to visual compliance

Product photography has historically been a highly controlled, end-to-end production process. Lighting, background, color accuracy, perspective correction, and retouching were discrete stages designed to ensure consistency, fidelity, and commercial usability. The photograph was a manufactured object, optimized for use across various media.

Computational systems collapse these stages into a unified semantic pipeline. Object recognition, background removal, color normalization, and perspective correction occur as part of a single interpretive process. The goal is no longer expressive representation but visual compliance - the image must satisfy platform, catalog, and algorithmic requirements as much as human expectations.

In this context, the photograph ceases to be a crafted artifact and becomes an assertion of product identity. The image is not refined; it is validated.

Computational photography has had similar impacts on other genre.

Computational photography has reshaped every major photographic genre. With 94% of all photographs worldwide now made on smartphones as of 2024, the center of photographic production has already moved. Its influence is now flowing backward into traditional cameras and software, not as an enhancement but as an ontological correction. The evidence is unmistakable: computational photography is no longer emerging. It is the photography system of the present, and the foundation of the photography system to come.

Understanding Photographic Language Pt. 1 – Meaning-making, grammar and dialect

We have watched photography move through three distinct phases: from purely mechanical operation, where the photographer controlled the ISO, aperture, and shutter speed directly, through an era of automation, where the camera began making those decisions, to the current computational age, where the smartphone camera functions as an operational partner.

In this new configuration, the roles are no longer ambiguous. The photographer directs — identifying the scene, framing it, and, most importantly, recognizing the relationships between the elements in the frame. The camera executes — handling exposure, tone and color mapping, HDR compositing, noise reduction, and a host of other technical processes.

This division matters because it marks a fundamental shift. As the mechanics have been absorbed by the system, the center of gravity in photography has moved away from technical control and decisively toward meaning-making.

The question, then, is not whether photography creates meaning, but how that meaning is constructed.

Traditionally, meaning in a photograph has been assigned to composition and to the objects contained within the frame. While this view has some justification, it is ultimately incomplete. It assumes that meaning resides in things.

Meaning is not found in individual elements, but in the relationships between them - emerging from their interaction as a whole, apprehended at once as a unified statement relating to the subject. This framework is not semiotics in any traditional sense. Meaning is not assigned through symbolic substitution.

Meaning in photography is perceptually emergent. It is the instantaneous apprehension of a set of relationships that collectively articulate something about the subject. Thus, meaning is encoded through:

-- relationships between elements

-- tensions between elements

-- context implied or denied

-- gestures and micro-gestures

-- spatial logic

and finally, what the photographer chooses to assert in the frame

A more technical way to describe this is that meaning is the semantic coherence of the photograph as a single, instantaneous statement. The photographer encodes this coherence into the image, and the reader decodes it in the act of reading the photograph.

This process can be understood through a three-part linguistic framework.

Author's note: It is understood here that object selection is the first step in recognizing the photograph, but it is not part of the syntax/semantics/pragmatics framework. Object selection determines what can be said, but not how meaning is formed. Object selection is the act that makes the framework possible.

Syntax: the arrangement of elements throughout the frame—composition, framing, depth of field, and spatial organization. This is what makes the image structurally coherent and legible.

Semantics: the meaning produced by the relationships between those elements including the tensions, alignments, and interactions that articulate the subject.

Pragmatics: the environment in which the photograph is encountered, shaping how the image is interpreted.

Meaning comes from the totality of the photograph, not from any individual element within it. It is the way the photograph organizes relationships into a coherent statement, and the way that statement is organized for the reader's perception.

Every photograph produces meaning because perception is always organized however the strength, clarity, and depth of that meaning vary. The structure of the photograph determines how strongly, clearly, or ambiguously that meaning is formed for the reader.

If a photograph organizes perception for both the photographer and the reader, and in doing so conveys meaning, then it is functioning as a language. And as such, it must possess an underlying grammar and a range of dialects.

One definition of photographic grammar is that underlying system making a photograph legible.

This definition is not complete because it does not address making the photograph a comprehensible statement. It only addresses readability. A better definition would include comprehensibility.

That expanded definition of photographic grammar holds –

photographic grammar is that set of structural relationships which govern how elements are organized within the frame, rendering the photograph as a coherent visual statement.

Photographic grammar is not found in the rule of thirds, the golden ratio, popular composition formulas, genre expectations, or editing styles. These function instead as stylistic choices, accents, idioms, or rhetorical devices. None are fundamental to making a photograph legible.

Six core grammatical elements that are inescapable conditions of the medium emerge:

Framing – what is included in the image - and just as critically, what is excluded. Nothing outside the frame can be referenced; exclusion is therefore as meaningful as inclusion.

Spatial Ordering (Position & Scale) - elements relate through size, position, overlap, and perspective. This functions as the equivalent of word order in a sentence. Change the spatial ordering, and the meaning changes - even if nothing else does.

Temporal Slice - every photograph is a structured slice of time. Not before, not after. Even in long exposures or composites, time is defined and bounded. Every photograph is of the past - whether six seconds ago or sixty years ago.

Light as Articulation - light does not simply illuminate; it separates, connects, emphasizes, and obscures. It functions as both punctuation and emphasis, far more fundamentally than direction or quality alone.

Focus & Resolution Hierarchy - what is rendered sharply and what is not establishes where attention begins. This creates syntactic priority within the image.

Contextual Anchoring - the assumption that the image refers to an external reality, grounding interpretation. This is not contained within the frame, but governs how the frame is both produced and read.

These grammatical structures have developed organically over time. They emerge from the constraints of the medium itself and from shared patterns of human perception. Optics, cognition, and collective visual experience have shaped their formation.

While grammar provides the universal structure that makes a photograph legible - the "what" - dialect emerges from which grammatical relationships are emphasized - the "how." It is this emphasis that produces the particular dialect being spoken.

The underlying structure – the grammar - has remained remarkably stable over time, while photographic dialects remain fluid - defined by shifting patterns of relational emphasis within the frame.

Dialect is not to be assumed to be genre. Genres describe subject matter. Dialects describe how meaning is constructed. What are commonly referred to as genres can be more precisely understood as recurring dialects; as patterns of relational emphasis that operate independently of subject.

There are six primary dialects examined here. Each represents a distinct pattern of relational emphasis and a distinct way meaning is constructed. While these are the basic dialects of the medium, they are certainly not the only ones that can be identified.

1. Spatial Continuity Dialect

depth across planes

continuity of detail

environment dominance

reader as observer

Meaning is carried primarily through spatial relationships across the frame and with continuity across depth reinforcing coherence. Contexts in this dialect can include landscape photography, cityscape photography, seascape photography, urban photography, etc.

2. Subject-Centric Dialect

focus collapse

background suppression

identity shaping

integrating reader / subject relationship

Meaning is carried primarily through a dominant subject and its relation to the viewer. Contexts in this dialect can include portrait photography, wedding photography, lifestyle photography, product photography, etc.

3. Controlled Isolation Dialect

ambiguity minimized

full legibility

context either stripped or specifically constructed

signal clarity

Meaning is carried through controlled, noise-reduced relationships where ambiguity is minimized. Contexts in this dialect can include studio photography, conceptual photography, fine art photography, experimental photography, etc.

4. Situational / Contingent Dialect

layered interactions

interruptions

partial information

opportunistic framing

Meaning emerges from contingent, often uncontrolled relationships unfolding in real time. Contexts in this dialect can include street photography, documentary photography, editorial photography, concert photography, etc.

5. Temporal Peak Dialect

decisive moment

motion control

anticipatory framing

action dominance

Meaning emerges from the precise selection of a transient, non-repeatable moment. This dialect includes sports photography, dance photography, wildlife photography, photojournalism, etc.

6. Perceptual ambiguity dialect

blur (motion or defocus)

suppressed detail

tonal compression or diffusion

indeterminate subject boundaries

Meaning emerges from a presentation that intentionally “under determines” what is seen and requires reader completion from that incomplete or unstable visual information. The perceptual ambiguity dialect is not defined by condition but rather by outcome.

None of these dialects are tied to subject as with genre; genre classifies subjects, dialects classify relational structure between objects in the frame. The same subject can be expressed through multiple dialects, each producing a different meaning. A landscape can be rendered through Spatial - Continuity or Controlled - Isolation. A person can be rendered through Subject - Centric, Situational - Contingent, or even Temporal - Peak structures.

Dialects are fluid. They can be combined, hybridized, and intentionally manipulated. But they remain overlays on photography’s underlying grammar—variations in emphasis, not replacements for structure.

It is also critical to note that all photographic dialects are not discrete categories but positions within a continuous three-dimensional space. The first axis runs from control to contingency, the second axis, time, runs from static to peak action and the third axis concerns signal density, running from isolated to distributed. All dialects, be they strictly implemented or hybridized, can be defined by their position in this three-dimensional space.

In all of this, photography’s fundamental grammar makes meaning possible and legible while dialect makes meaning specific and photographic education must change to reflect that reality. How it must change is the subject of Part 3.

Understanding Photographic Language Pt. 2 - The single photograph

Just as the sentence is the smallest unit of spoken or written language that conveys a complete spoken or textual thought, the single photograph is the smallest unit of photographic language that conveys a complete visual thought.

Consider the following sentence:

The car is red.

This is a complete thought – it contains a subject (a person place or thing) – “car”, a verb (action or state of being) -- “is” and, in this case, an attribute (a condition, quality or feature as a characteristic of the subject) – “red”. It is also marked by a period (“terminal punctuation”) signifying the end of the sentence. In decoding this sentence, we read each word in sequence from left to right. At the end of the sentence we know there is some kind of car and that it is red. And most importantly, that is all we know. We know nothing of its age, make, model, location, etc. We have no context for the car.

Consider each photograph on the following four pages (these are intentionally presented individually) --

This is the photographic version of the sentence on the previous page and it contains all of the information in that sentence. The photograph communicates the same central proposition as the sentence: there is a car, and it is red. Unlike the sentence, however, it also carries additional visual information that the text did not explicitly encode. We see it is a “smaller” car and it is most likely “older”. Beyond that, the photograph tells us nothing else.

But here is the difference – instead of “reading” sequentially to get the information, we apprehend the car, its color and the lack of context instantly and simultaneously.

Generally speaking, we have more information in a complete photograph than just the cut-out of the subject against a blank background. We generally have at least both foreground and background elements.

Consider the photograph below:

We see the same red car as on the preceding page with all the same attributes but here it is parked by what appears to be the curb of a side street in front of a granite block wall with two barred windows and two small access ports. The curb is separated from the wall by what appears to be a sidewalk.

While we have a context for the “red car” this is all we know.

And, again, this photograph is a complete thought.

Now, consider this photograph:

This is a far more visually complex and layered photograph with medical professionals in a surgical theater operating on a patient. We have all the context we need to make this association.

The individuals are dressed appropriately and paying attention to the activity depicted, the instruments and assistive technologies are appropriate to the scene, lighting appears to be consistent with the scene, etc. Beyond that, the photograph tells us nothing.

In all fairness, the active visual scanning of this photograph is not as instantaneous as with the parked car, but the net effect is still apprehension of the scene “in the blink of an eye”.

Consider this photograph:

This photograph, in which the photographer used a “leading line” composition technique rising from the left midpoint of the frame to the upper right, appears to be a portrait of a family group.

“Dad” is anchoring the line to the left and slightly below. “Mom” is anchoring the line to the right, slightly above. “Junior” and “Sis” fill in the space between “Dad” and “Mom”. The setting appears to be either a rural area or a park based on the obviously large log used as posing prop and the background.

Again, the photograph is a bit more layered and complex but apprehension is almost immediate.

Anything beyond those observations remains outside the frame.

All of the preceding photographs give us, the readers, a complete thought but they do not give us anything close to a complete story or even a portion of the complete story.

The single photograph is, at best, a story fragment. A single photograph records one communicative act. The photographer has recognized something meaningful and encoded that meaning through the relationships among the elements within the frame.

In effect, every successful photograph asks a question:

What's the story here?

The reader's task is to decode the visual relationships presented in the frame and recover the meaning the photographer perceived.

But this analysis applies only to the scene contained within the frame. Once we begin asking what is missing from the subject's story we move beyond the single photograph and toward visual narrative.

When we break the concept of the single photograph down there are four grammar-related principles to remember beyond the standard considerations of composition, exposure, processing, etc.

The single photograph is always a slice of time. Whether the exposure lasted 1/6572 of a second or 137 minutes, every photograph documents a slice of time. Whether it is rush-hour traffic on the interstate from the overpass bridge or the constellations above us, it is a slice of time.

The single photograph is always the slice of a larger story. The single photograph is always only one element of a story that started before the photograph was taken and will continue after the photograph was taken. The third inning of the baseball game is not like the second inning was or what the fourth inning will be. The story extends on both sides of the photograph.

The single photograph is always a selective framing of reality. Not that it changes the reality of the scene but that it isolates certain elements within the larger reality and presents them as a complete thought with nothing outside frame visually impinging upon those elements.

Although the single photograph presents itself as a complete visual thought, it inevitably leaves portions of the larger narrative unstated. In this, multiple photographs around the same subject build more complex and complete narratives leading to essays and documentary projects.

These expanded projects often lead the reader from apprehension of meaning based on the photograph's content to comprehension of the subject's story based on the storytelling in the larger, more extensive photographic essay.

Understanding Photographic Language Pt. 3 – A full curriculum

The underlying premise here holds photography is a fully meaning-making language system with a fundamental, universal grammar and multiple dialects. In this framework, a "language" is defined as a system in which meaning is produced through structured relationships between elements under identifiable constraints.

The 30-credit hour program detailed here is designed around photography as a contemporary, meaning-making language rather than a tool-based craft and is premised on students using what is the dominant contemporary photographic apparatus, specifically their smartphone camera and nothing else — no handles, grips, accessory lenses, or manufacturer 'photo kits'. Instruction regarding camera use is dispensed with early in each class.

In each class students are given their assignment for the semester during the first meeting. In general, they are expected to develop a semester-long project within that assignment.

In the traditional infrastructure, a student can successfully complete one assignment and move on but to become truly conversant with the intended learning, the student must execute the assignment within the given dialect over an extended period of time. Bluntly, a student can successfully complete a single assignment, often with little difficulty, but as with any language, true fluency emerges only through repetition, variation, and sustained engagement.

Evaluation is always a concern in a program with long term assignments. All work submitted is evaluated through five analytical lenses: semantics (what was selected?), syntax (how are elements related?), grammar (how was the image shaped?), dialect (under what conditions does meaning emerge?) and context (where does the image live within that dialect?). It is expected students will use these five lenses when developing projects and taking the photographs to complete their projects.

All of the classes in this program are credit/no credit. An exception is made for the History of Photography requirement which would follow a school's standard process for evaluation and grading.

As this program is functionally more about mentorship, evaluation is an ongoing process where both instructor and student have input and the primary metric is growth over the semester as shown in submitted work. It is acknowledged that class sizes would need to be capped to preserve the mentorship model.

Based on a 14-week semester, a student's project concludes in the 12th week and is submitted for final evaluation. By the end of the 14th week both the student and instructor write a narrative describing the goals of the learning, how those goals were met, how well those goals were met and what further learning the student might pursue after the class concludes. Identifying continued learning is an essential evaluative component as photography is a lifetime pursuit for many.

Students will be expected to submit work weekly as the basis for ongoing mentorship and will be expected to participate in weekly mentoring sessions during the regularly scheduled class time. This mentoring is intended to give the student direction and feedback from the instructor leading to the submission of a coherent body of work within the selected context(s). Students will also receive feedback from other class members forming a "community of workers" (in Weston's sense - peers engaged in parallel, serious practice rather than casual critique). While the intent is for the program to be on-campus/in person, with sufficient resources it could be provided online.

A note on cameras and instruction - The smartphone is not used here as a convenience, but as a standardized photography system that handles the myriad of traditional technical decisions, allowing instruction to focus on meaning rather than mechanical control. Its purpose is not technical mastery but calibration; establishing a shared, minimal level of operational understanding so that all students can engage the semester-long assignments on equal footing.

Once this baseline is established, the camera recedes from the foreground of instruction. The focus of the program is not on how the camera functions, but on understanding how photographs function as a communicative, meaning-making language developed through sustained practice, repetition, variation, and critique.

All submitted work must be web-safe, camera-native JPEG (or WebP where applicable) files with intact EXIF data. Computational RAW (Google), ProRAW (Apple), or other RAW formats are not permitted, as this program is concerned with understanding photography as a meaning-making language. Students must work with their camera's fully resolved output rather than intermediate data representations. This ensures meaning is constructed at the moment of image formation and not deferred to post-processing. Allowing deferred construction through RAW processing shifts meaning-making out of the act of photography and into post-production, which this program explicitly excludes.

Note: As of this writing, Apple and Google, the leaders in smartphone camera development, are introducing a growing number of artificial intelligence-based features that adjust or modify photographs after they have been captured. These features include, but are not limited to, removing unwanted people or objects, using generative AI to extend a photograph beyond its original boundaries, and reframing an image by synthesizing new visual content.

For our purposes here, these and similar capabilities are not considered part of the computational photography capture framework. Rather, they are post-capture / post-output generative editing tools that operate on a completed photograph after the computational imaging pipeline has produced a finished image. Accordingly, the discussion here holds computational photography to image formation during capture and the unmodified JPEG (or WebP when applicable) output and does not consider post-output generative image manipulation.

The individual classes are described below (all are based on a 14-week semester). Class meetings are designed to be single weekly "time blocks" of three hours with no separate "lab hours" (as there used to be with the traditional lecture class and wet darkroom hours):

Semester 1: Computational photography (3 hours – 3 hours total)

Define photography as meaning-making language

Discuss semantics (object selection), apprehensive syntax, connotations for both the photographer / reader

Discuss grammar

Discuss dialects

Discuss contexts

Briefly describe smartphone camera computational process

Briefly describe camera operations IN TERMS OF GRAMMAR

- brief discussion of night mode

- brief discussion of portrait mode

Discussion of storytelling.

Discuss nature of assignments – assignments are long term (semester long) and storytelling based. They are defined in terms of dialect but unstructured in terms of context. There are scheduled, periodic (weekly) checks.

Evaluation – both student and instructor have input, courses are credit / no credit

Assignment – photograph our campus. Note that this assignment (and this assignment only) is more specified than those in the rest of the coursework and is specifically designed to acclimate students to semester-long work.

Semester 2: Spatial Continuity Dialect • (3 hours – 6 hours total)

Brief review of Computational Photography

Discussion of specific dialect as marked by:

depth across planes

continuity of detail

viewer as observer

environment dominance

Meaning is carried primarily through spatial relationships across the frame, with continuity across depth reinforcing coherence. This dialect can include landscape photography, cityscape photography, seascape photography, urban photography, etc.

Assignment: photograph within various contexts

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 3: Subject-Centric Dialect • (3 hours – 9 hours total)

Brief review of Computational Photography

Discussion of specific dialect as marked by:

focus collapse

background suppression

identity shaping

integrating viewer / subject relationship

Meaning is carried primarily through a dominant subject and its relation to the viewer. This dialect can include portrait photography, wedding photography, lifestyle photography, product photography, etc.

Assignment: photograph within various contexts

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 4: Controlled Isolation Dialect • (3 hours – 12 hours total)

Brief review of Computational Photography

Discussion of specific dialect as marked by:

ambiguity minimized

full legibility

context stripped -or- fully constructed environment

signal clarity

Meaning is carried through controlled, noise-reduced relationships, where ambiguity is minimized. This dialect can include studio photography (portrait or product), conceptual photography, fine art photography, experimental photography, etc.

Assignment: photograph within various contexts

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 5: Situational / Contingent Dialect • (3 hours – 15 hours total)

Brief review of Computational Photography

Discussion of specific dialect as marked by:

layered interactions

interruptions

partial information

opportunistic framing

Meaning emerges from contingent, often uncontrolled relationships unfolding in real time. This dialect can include street photography, documentary photography, editorial photography, concert photography, etc.

Assignment: photograph within various contexts

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 6: Temporal Peak Dialect • (3 hours – 18 hours total)

Brief review of Computational Photography

Discussion of specific dialect as marked by:

decisive moment

motion control

anticipatory framing

action dominance

Meaning is carried by arresting action at its peak in real time often in a natural setting where that action occurs. This dialect can include sports photography, dance photography, event photography, or any setting in which there is an organized or unorganized action pending.

Assignment: photograph within various contexts

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 7: History of Photography (3 hours – 21 hours total)

Instruction and evaluation per institutional standards and as offered in the regular course catalog but prior to beginning Capstone work and

Capstone preparation (3 hours – 24 hours total)

This course is designed to assist students prepare for their capstone project which includes

defining the project

developing the project storyline

developing the production outline

arranging for any necessary resources

arranging any necessary permissions and developing appropriate releases

developing at least a tentative production schedule

Evaluation – both student and instructor have input, courses are credit / no credit

Semester 8: Capstone project (6 hours – 30 hours total)

The capstone project represents a sustained, self-directed body of work demonstrating fluency across one dialect of choice and a clear command of photographic meaning-making.

Evaluation – both student and instructor have input, courses are credit / no credit –

Possible college publishing of final project. Computational photography is pre-req for all dialect courses; computational photography and all dialect courses are pre-reqs for capstone prep and capstone prep is pre-req for the capstone project.

Telling the subject's story as completely as possible

Note: The following four sections are proposed texts for the program:
--- Telling the Subject's Story as completely as possible
--- The key is writing stories people want to read
--- A real-time guide to using your smartphone camera to its full advantage
--- You really don't need all that stuff for post processing

Although it seems to come in waves, we get a fair amount of discussion about storytelling in photography. We get discussions of storytelling related to equipment. We get discussions of storytelling related to lighting. We get discussions of storytelling related to post processing. The problem is none of this is really about storytelling; it's always about equipment or lighting or post processing or any of the other conventions of photography.

Here we will be discussing the art of storytelling itself because this (storytelling) is what that (photography) is all about… telling the subject's story.

It doesn't matter what camera you use (although using your phone is highly recommended for a lot of reasons). It doesn't matter what lens you use. Your post processing software and workflow are truly of little importance. What is of monumental importance is the quality of the storytelling.

And just to reinforce the point, the story being told is the subject's story.

And just an FYI – there are some basics to go through before getting to the specifics about storytelling.

Why We Photograph

There are a lot of reasons people give to explain taking photographs but it would seem the real reason is rooted in the fact that we're social creatures. We photograph to document our lives, as an expression of interest in a subject and to validate or corroborate the importance of what we saw. All of this is to share with others.

We have documented our lives from the beginning of time using both words and images. Words came when we sat around the fire, talking about what we did that day. Images started with paintings on the cave wall. In a modern, technical society we are able to combine words and pictures in social networking, video chat, web-based presentations, digital books, digital video, television, motion pictures, magazines, etc.

It seems the desire to document our lives is somehow hardwired in our brains. Go to any high school or junior high and look at the kids' notebooks or phones – they are filled with pictures of their friends, their siblings, their friends, their pets, their friends, themselves, their friends, their parents, their friends, etc. It seems that no one has to tell them to do this. It's hard wired.

Look at the popularity of Flickr, 500px, Facebook, Snap-chat, Instagram and other social networking sites. For many, these are really nothing more than places to document their lives and to do it in a way that can be shared with others. These are the

modern and technical equivalent of putting the drawing on the wall for the next group that inhabits the cave.

As societies become more technologically advanced and more literate, the documenting of our daily existence becomes more prevalent.

Today it's very natural to pick up a camera, be it a dedicated camera or, more likely, the one in your phone, and photograph. Holiday meals, before the prom, the big game, on vacation, the dog, the cat, the Christmas tree, the family gathering, boyfriends, girlfriends, weddings, divorces, husbands, wives, yourself, your room, your house, your son, your daughter, your mom, your dad, your car, your neighbor's car… all of these and more are photographed and shared regularly.

We share our photographs freely and openly with family, friends and with the complete strangers who visit our web pages.

We photograph to express our interest in a particular subject. This can be the landscape, the cityscape, our kids, our families, cars, motorcycles, baseball, architecture, our family activities, our pets, our plants, our travels… this list can also just go on and on.

The act of photographing is simply the means of exploring those things that have meaning to us or interest us. It allows us to share that meaning or interest.

Notice that for the overwhelmingly vast majority of folks, the interest is in the subject, not the process of photography.

And finally, we photograph to validate or corroborate what we saw.

At one level this validation is simply to prove that what we saw was there… to say that, at least for that moment, it existed in front of our eyes and in front of our lens. The photograph proves it. But more importantly, the photograph validates that we saw what was there. The photograph validates both *that* we saw it and *how* we saw it. Most importantly, the photograph validates what was important to us about what we saw.

The validation comes from the mere existence of the photograph. Whether we do anything with that photograph is not the question. It makes no difference if the photograph sits printed in an album tucked away in a bookcase or is posted to the internet for the world to see; the fact that the photograph exists and can be shown to another is the validating factor.

Notice again that none of this has the slightest thing to do with the process of photography itself.

The vast, overwhelming majority of people do not participate in photography for photography's sake. The process of photography is simply a means to an end. And that end is communication with others about the subject… the story of that subject from our perspective.

Photography As Communication

At its heart, photography is communication. It's communication about the subject being photographed. It's communicating the reality of the subject along with the ideas, perceptions, understandings, feelings and emotions the photographer brings to the

subject. That is, simply put, it's about that subject and what that subject's story means to us. (And there is no denying that it may mean different things to different people.)

There are a few fundamental requirements for communication to happen. At its basic level, communication is sending or transmitting "intelligence" or "a message" from one person (a sender) to another (a receiver) that is understandable by the receiver using a method or channel.

Obviously, if any one of these basic requirements is missing (a message, a sender, a receiver or a channel), no communication occurs.

In photography, the message must be understandable by the person viewing or reading the photograph. This is where the complex interrelationship between the photograph and text helps to communicate a better understanding of the subject and the subject's story. The text could be a short introduction to the work, an essay about the subject and/or individual captions for each photograph.

Very basically, the photograph gives us the nouns while text gives us the verbs.

In this approach to photography:

- The *full* message is contained in the combination of the photograph and text. The photography provides the information the text can't. The text provides information the photography can't.

- The photographer is the sender of the intelligence or message.

- The receiver is the person who views or reads the message (Here we refer to "consuming" a photograph as reading.)

- The print, book, phone, magazine, network, etc., is the channel to convey the intelligence.

And rather than a simple restatement of reality, as photography is often characterized as being, the message or subject's story is filtered through the photographer's perception, recognition, understanding and appreciation of the subject.

Assume four photographers attend a custom car show. To the first, the importance lies in the variety of engines used to power the cars. To the second, the importance lies in the different interior designs. To the third, the importance is found in the different paint schemes. To the fourth photographer the importance lies in the people attending the event and the commerce the event generates.

None of these choices are right and none are wrong. They are simply what each photographer feels should be the focus or subject of the work; what the message, intelligence or subject's story should be.

The photographer encodes that message in the photographs. The reader then decodes the message.

The channel used to get the message from the sender to the receiver is irrelevant. It doesn't matter if the photograph is electronic or physical. It can be as an individual print, in a web gallery, in an email or a text, in a book or a magazine. It can be held in the hand or read on any one of a number of devices connected to the internet.

When or where the complex of photograph and text is read has no impact on the communication. It can be accessed at some undefined time in the future and accessed from some undefined place independent of both the storage system's location and the sender – the important thing to recognize is that the communication from sender to receiver still occurs. It occurs over both time and distance and both the time and the distance spanned are irrelevant to the message.

The two unchanging principles that have defined photography and therefore photography's communication from its beginnings are reality and transparency.

The principle of reality holds that what is presented in the photograph is real. Transparency holds that the photograph is presenting the subject as it was seen. Both of these may seem to be keen perception of the obvious, but each one needs to be expanded a bit…

Reality holds that the subject of the photograph actually existed. This has nothing to do with what is photographed or how it is photographed. It is all about photographing the scene and the subject as it existed at the time.

Transparency holds that the photograph is presenting the scene and the subject as it was seen. This certainly does not mean we can't make adjustments in terms of contrast, sharpness, color balance, cropping etc., but we can't manipulate it to the point that it is no longer the scene as it was seen.

Both of these principles embody the trust that society places in photography and are central to the viability of the medium, giving photography a special place in the public eye. It is the continuation of this trust that photographers must adhere to.

The watershed is whether the photograph conveys what was actually seen or presents what the photographer wished he or she saw. To present the subject as the photographer wishes it had been seen is to create visual fiction. Photography is inherently non-fiction, telling the subject's story. Anything other than this makes the work about the photographer and not the subject.

It bears repeating that these twin principles of reality and transparency have allowed photography to earn a special trust with most people… namely that you can believe what is seen in the photograph as being the subject's story. These two principles are mind numbing in their brevity and simplicity but are also astonishingly demanding.

Creativity and Creative Development

Real creativity comes when a photographer-

- investigates a subject of interest, and

- develops a project around that subject that reflects his or her personal "take" or appreciation, and

- recognizes the significance of any given scene to advance that project, and

- captures that scene in a way that reflects his or her understanding and appreciation of the subject's story, and

- recognizes the additional information needed to fully realize the telling of the subject's story.

The rest of the process – the entire rest of the process – is devoted to presenting the results of the project. Nothing more than what was seen, nothing less than what was seen and nothing different from what was seen.

Just to be as clear as possible about this, real creativity is not something that is "done to" or "added to" or "applied to" a photograph in post-production. It's not adding sprinkles to the cupcakes after they're baked. Creativity is baked into whatever your project is from its inception. In the end, it's what directs and drives the project. The project itself is the creativity.

There are all kinds of "step programs" that have been put forth to help folks initiate and organize their "creative process". Some have as few as four steps and at least one has 22 steps. But in the main, there seem to be five phases or periods of creative development that the photographer, and hence the project, will go through.

Notice that there is a change here- it will no longer be referred to as the "creative process". "Process" implies a number of preset steps that you follow and, at the end of the "process", you have your project all tied up in a nice, neat package with a pretty bow on top.

Sorry.

From here on it is called what it truly is, "creative development".

The first phase is the genesis. This is the phase in which you develop the kernel of the project. This is the idea phase. It's the "what if…" or the "how about…" or the "wouldn't it be neat if…" stage. This stage may last only five minutes or it may last days or weeks while you figure out exactly what the idea is.

Once you think you've got it figured out, write it down. This helps give the idea shape and makes it real. When the idea is 'only in your head', it is perfectly formed and immensely doable. When it's on paper, the shortcomings become evident and can be addressed before moving onto the next phase. Remember, if the shortcomings evident at this point aren't addressed, they will be harder or possibly impossible to fix later.

Keep in mind that "the idea" is not always about "something totally new". It can be about seeing something in a new way or taking a different approach to the subject.

Next is the development phase. This phase includes refining your idea and doing all of your research. If your project is your child's fourth birthday party you probably won't have a lot of research to do but if it's the architecture of your town's downtown area or photographing the Founder's Day activities celebrating the town's sesquicentennial, you might have a considerable amount of research to do.

In this phase you need to be open-minded and follow where the research leads you. This is when you start considering all of the options that are available to you. You literally start thinking inside the box, outside the box, above the box, below the box, without the box, etc. You're not selecting final options here, just looking at all of those available to you.

Project development is followed by synthesis in which you try to narrow all of the options down to the approach that will guide you through the actual photography of the project. Some refer to this as the “ah-ha” moment.

But it’s not really…

What a number of writers would have you believe is that after you have come up with the idea and have done the refinement and research, you can go off and do all kinds of other things and the synthesis will be forming in your subconscious. It’s there, in the background, magically creating your project. And then BANG! On a Saturday morning at 9:37 it hits you… you’re outside mowing the lawn… and there it is… the long-awaited answer to how to approach the entire project. And it’s just so perfect! It can only work!!

We won’t go on with this because it isn’t always a moment. It isn’t even usually a moment. It isn’t even sometimes a moment. Like the genesis phase, the synthesis can come in a single, blinding, all-encompassing, jaw-dropping flash, but more often it develops slowly and with considerable consideration. You may have to try several approaches or combinations or rearrangements before you have the “right” synthesis for your project.

In many ways, synthesis can be like editing your project. Editing and synthesis are both very intense experiences and you have to work through both with a measured approach, considering all of the elements and looking for a way to combine the elements that reflect the true idea of the project. You may not hit the “winning” combination right away. This is also the phase which can take the longest as you try different ideas to see which one is the most effective at getting the subject’s story told.

Synthesis leads to implementation. This is when the actual photography starts. This is when you start to exercise your vision at two complimentary levels- at the level of the project and then at the level of the individual photographs that are defined by the context of the project.

As you were open-minded during the genesis phase, you have to be open-minded during the implementation phase. This means that you’re open to all of those photographs that are within the context of the project and might help move the project forward. Notice the word “might” and all of the implications for shooting. During this phase you will always shoot more photographs than you will need in the final project because you won’t be able to determine which you will be using while you are shooting.

This is where evaluation and feedback come into play. It is also referred to as editing. The idea here is to use just those photographs that, within the context of the project, advance the project in the strongest and most complete way possible. If it doesn’t do that, regardless of how good or unique it is, it’s not used. At this point, it is consideration of the individual photographs that support and advance the project.

The other part of the evaluation process is whether the project as photographed meets the goals set out in the genesis and development phases.

If it does, great! And yes, it has happened that you get to this point and are disappointed with the results. (It happens more often than most folks would care to admit, actually.) Perhaps the photographs are not forceful enough. Perhaps the project loses focus. Perhaps it moves in an unforeseen direction.

There can be any number of reasons a project misses the mark but it's always valuable to try and figure out where things might have gone awry so you can either try to fix the problem or start over, moving in a different development direction.

In the end, after going through all of the development phases, the project must reflect your unique take on the subject. The photographs, and hence the project, need to reflect your knowledge, understanding and appreciation of the subject and your consideration of the needs of the reader to engage with the project.

Without both of these, the end result will be flat and emotionless at best or feel like it was assembled by committee at the worst. The photographs may be technically perfect but if there is no recognition of the reader's needs, they simply become things to look at and not a unified, cohesive statement of the subject's story.

Creative development functions within the context of any project, regardless how big or small that project is. Creative development does not wrap the project with some type of external sleeve but rather guides the project from within and is present from inception through completion. It also lives within the photographer's knowledge, understanding and appreciation of the subject.

The photographer just has to realize it and realize that the project is the creativity agent.

Six Traits of Successful Storytelling

Just as the exposure for any photograph is based on a "three-legged stool" (ISO, aperture and shutter speed), telling the subject's story is a three-legged stool as well. While the first two legs, the photographs and the text, have to work both separately and together, the storytelling, the third leg of the stool, has to work as well. There are six traits or characteristics that will help shape your storytelling. These characteristics are engagement, framing, structure, theme, brevity and avoiding the trendy.

1. Engagement.

Within the first few sentences or the first few photographs the reader will decide if it is worth continuing with the work so it must be put together in a way that engages the reader from the very beginning. The storytelling must elicit the reader's interest by making the subject's story relevant and interesting in some way.

The storytelling has to find the human element. Facts and figures are nice and, at times, may be necessary to advance the subject's story, but these generally reduce the story to a collection of bullet points. A solid narrative that makes the subject relevant to the reader is always preferable. There are some basic questions that can help focus the narrative:

- Who am I trying to reach about this subject?

- How do I cast this story to meet the reader's needs?

- Why does the reader want to know about this subject?

- What does the reader want to know about this subject?

- What is the context of the story.

The other aspect of engagement is for you to allow your enthusiasm for the subject to come through the work which will help frame it for the reader.

2. Framing.

The framing of the subject's story is where you, as the storyteller, establish your perceptions, ideas, impressions, appreciations and understandings of the subject and use those to conceptualize the story. The idea of framing the story is critical as it will give the reader a "frame of reference" for the work.

It must be noted that the framing is never openly stated but rather comes through in your approach to both the subject and the subject's story.

3. Structure.

You need to provide a structure that the reader can follow. There are two levels of structure that need to be addressed.

The first structural level is often just thrown out as a reminder that every story needs to have a beginning, a middle and an end.

The "beginning" or start of telling the subject's story is both the "where" and the "how" that gets the reader into the story. Right from the start you have to provide the reader with enough material to get and keep their attention. The job here is to open the story for the reader and keep them interested enough to move on through the remainder of the material.

The "middle" of the story is where the reader gets the most information about the subject. This is the "meat" of the subject's story, if you will, which gives the reader the details of the subject's story. This section must be built to keep the reader's interest. Care needs to be given to keep from overloading the reader with information, however. You don't want to give the reader so much information that they "glaze over". This is a delicate balancing act between too little information and too much.

But the "middle" of the work, which was set up by the "beginning", has to lead to a logical "ending". This ending has to provide what could be considered the successful culmination or conclusion of the subject's story.

One way to visualize this is that you are building a hamburger with the story.

The beginning of the story is the top of the bun. The bread is the strong opening with the sesame seeds providing a few of the details. Below that you have the "fixins" ketchup, mustard, lettuce, onion, tomato, avocado, bacon and cheese supporting the main idea, the beef patty. And finally, you have the bottom bun which is the conclusion or ending of the subject's story.

So you have the opening, the main idea with all the supporting details and the conclusion of the subject's story.

One thing should be obvious from the beginning, middle and end structure that is one of the keys to successful storytelling – you probably won't be able to do this with just one photograph.

The other structural level you will need to address is how the story will be organized. That structure can be:

- Sequential – Once upon a time… and then… when… but while… and then… finally.
- By priority – showing the story elements in their order of importance.
- By event – the Founder's Day celebration, Bobby's fourth birthday, etc.
- By activity – Mary's summer in Little League.
- By location – Our visit to Grand Canyon.
- By subject – my new car.

You should limit a particular work to one type of organization except when in combination with sequential organization. You can base your work on your summer vacation (structure by activity) but then it could be organized sequentially by what you did first, what you did next, etc., or by priority covering what the most important parts of the trip first, etc.

4. Theme.

The theme is what the story is about. It is also called the subject of the work. It may seem keen perception of the obvious but you should restrict the work to a single theme. Unfortunately, it is not uncommon to start out with one theme, wander to another and then jump to a third. This becomes a problem for the reader as the second and third themes are often related to the original only tangentially. The best way to prevent this wandering is to use an outline. And what you find is the more detailed the outline, the easier it is to tell the story you want.

5. Brevity.

Whenever you are involved in storytelling the idea is to give the reader as concise a work as possible that still effectively presents the subject's story. There is an old but still very true guidance that holds you never use a phrase when a word will do, never use a sentence when a phrase will do and never use a paragraph when a sentence will do. The goal, both photographically and textually is to fully explore the subject but in as compact and concise a manner as possible. The other idea that applies here is economy of expression - avoid the fluff and repetition that can sometimes work its way into a piece on both the photographic side and the text side.

6. Avoid the trendy/bleeding edge stuff.

Unless your subject's story is about the trendy/cutting edge/bleeding edge stuff that appears every now and then, leave the trendy/cutting edge/bleeding edge stuff out. More often than not it simply gets in way of telling the subject's story. It may be fun to do but more often than not, it leaves the reader cold.

Six Traits of Successful Photography

In a traditional approach to photography, you learn a lot about the mechanics of exposure, composition and "photoshopping". But mechanics are just that, mechanics. And, at the risk of sounding redundant, they become mechanical. They produce results that look well... mechanical.

There are six traits or characteristics that go far deeper than simple mechanics or technique. These traits, which photography shares with writing, are ideas, element choice, organization, fluency, voice or style and conventions.

1. Ideas.

It has often been said that light is the heart and soul of photography... not so! Ideas – and hence storytelling – are its heart and soul. Ideas bring the story into existence. Ideas allow photographs to spring to life. Ideas come from our interests. Ideas shape the message being told which in turn generates the content.

- An interest in paintball can lead to photographing the competition.

- An interest in bicycles or motocross can do the same.

- An interest in people can lead to portraiture.

- An interest in architecture can lead to photographing buildings.

- An interest in geology can lead to photographing the landscape.

- An interest in history can lead to photographing sites of local significance.

- An interest in... well, the list can go on and on.

But, on the downside, there is a huge problem with ideas. They can easily lead you astray so you have to limit them within a project. The more narrowly defined the project (to a point), the more the ideas are going to fit.

Now some may say that limiting ideas in a project is "counter-intuitive" or "self-defeating." To a point they are right. But without some self- imposed structure, projects tend to wander and lose their focus. The message becomes muddled and, often, abandoned.

2. Element choice.

The objects that appear in the photograph are the elements and it is how you use these elements to tell the subject's story that is critical.

Most of the time, element choice focuses on what to include in the photograph but it also is about what to leave out. This can be more important than what to include. Often, there can be distracting or competing elements around the subject that have to be managed in terms of the story being told. Here is where a little caution is needed- you can't remove so much that the context of the subject is lost. If the context is lost, the flow

of the story is lost. And, after all, that is what we are doing… storytelling… but it's the subject's story we are telling.

Beyond this idea of what to leave in and what to leave out is whether or not the strongest elements are being used to tell the subject's story.

3. Organization.

This flows directly from element choice. If you have the strongest elements in the frame, the next step is to make sure all of them are supporting the subject or main element.

This often requires some walking around, looking and taking multiple photographs.

Sometimes you have a degree of control over the placement of the elements.

If you are photographing a still life, you have complete control over the placement (organization) of the elements in the scene. Similarly, if you are photographing people or cars or boats, etc., you can pretty much stay in one place and move them around until all of the elements are arranged (organized) appropriately in the scene.

But if you are photographing landscapes or buildings or the Little League game, you don't have that degree of control. You will have to do the moving until the elements are positioned appropriately. This can mean moving in closer, moving to the left or the right, moving in or backing up or zooming in or out so you can include everything you want in the photograph.

Notice the word "appropriately" is used to describe arranging the elements in the frame and not the word "correctly". There is no "correctly" in any of this. The arrangement or positioning of the elements is based on the story you want to tell – on the message you want to communicate to others about the subject.

For example- you and your family are on vacation at Grand Canyon. Rather than (or in addition to) photographing them standing by the National Parks Service sign in front of the visitor's center that says "Welcome to Grand Canyon", photograph them at some of the points where the canyon lies in the background. The story is the family vacation to Grand Canyon. So maybe the approach should be photographs of Grand Canyon that include the family rather than making photographs of the family that try to include the canyon.

If the family is gathered at Uncle Jacob's farm, instead of doing the group shots in front of the house, like they are every year, how about using the barn or the tractor or the barn and the tractor as the setting? And rather than having everybody stand in front of (around?) the tractor, how about having some folks sitting on the tractor?

In these examples, the elements have been chosen more carefully and the organization of the elements has been worked into the photograph to strengthen it.

4. Fluency.

This is probably the most subjective of the six traits. The fundamental question to be answered here is whether or not the content flows easily and freely in the frame allowing the reader's eye to move without difficulty?

In the photograph of the family gathering on Uncle Jacob's farm- if we had one group standing at the front of the tractor, one group in the center and one group by the rear, we would have a segmented, mechanical photograph. If, on the other hand, we had all of the family members intermingled and just kind of hanging around the tractor, the photograph would appear much more natural and it would be much easier to read.

5. Voice.

This trait is closely linked to fluency in terms of subjective evaluation. Voice in photography is synonymous with style. If you follow your own stylistic inclinations, you will create work that has more of a chance of connecting with the reader because it is personal and looks nothing like something “created by committee”.

And there are all kinds of personal traits in voice- Some of us take a more formal approach while others are more casual. Some of us take a wider view of the world, looking more at the overall scene, while others take a tighter view, looking at details. These are some of the elements that go into making up a photographer's style or voice and all of these approaches are valid.

The important thing to remember here is that the subject of the photograph is *what* you photograph; your style or voice is *how* you photograph it… the subject is what your subject’s story is about while your style or voice is how the story is told.

We all have our own approach to things. If you follow your instincts in this then you are developing your own voice. Doing that, while putting your perceptions, ideas, emotions, understandings and appreciations of the subject into the work will create photographs that will connect with others.

6. Conventions.

Of the six traits, this is probably the easiest to look at as it is absolutely objective. This trait looks at all of the technical and appearance issues relating to the photograph.

These include such things as:

- No color or tonal banding
- "Correct" tonal balance
- No color cast
- Appropriate density (lightness/darkness)
- Appropriate contrast
- Appropriate detail/texture in the shadows and highlights
- Solid, crisp focus on the main subject or element, etc., etc., etc.

Paying attention to these conventions helps create a photograph that doesn’t call attention to itself but calls attention to the subject. The photograph becomes almost transparent and allows all of the attention to focus on the subject’s story.

*The "Six Trait Writing" system was developed by Northwest Regional Educational Laboratories, Portland, OR

Six Traits of Successful Writing

Whether you are writing an introduction to your project to give context, an essay to expand the reader's information or captions to enhance the individual photographs, the goal is still to tell the subject's story and communicate a message about the subject. Just as with the photographs, there are six traits or characteristics that help shape the writing. These traits are essentially the same as those guiding the photography — ideas, word choice, organization, fluency, voice or style and conventions.

1. Ideas.

The ideas to incorporate in the writing will all come from the photography and will answer one fundamental question – *what do I need to tell the reader about the subject that the photographs can't*? Another version of the same question is… *what is the context the reader needs to have to fully understand the photographs*? Some examples are-

- We have a photograph of a group of people… who are the people in the photograph? Why were they photographed? What is the importance or relationship of the people in the photograph?

- We have photographs of a community event… what was the event? What was being celebrated? When was the event? Where was the event?

- We have photographs of what appears to be a family vacation… the first thing that needs to be answered - is it? Who are the people in the photographs? Where were the photographs taken? When were the photographs taken?

These will often take the form of reporter's questions – who? what? when? where? why? how? and so-what?

A process point here – as you develop your ideas you will want to jot them down at least as notes. Using those notes, you can develop a simple outline to help guide your writing. Having a good outline can help the writing process go more smoothly.

2. Word choice.

Very simply, you need to make sure the words chosen to accompany the photographs in either an essay, introduction or caption are specific and accurate using language that is natural and not overdone.

We have a photograph of a girl pitching during a softball game. Example 1 (boring caption):

"Mary pitches during her game Tuesday. She and her team won the game over the Mustangs 8-0."

Example 2 (same game but much better caption):

“Mary comes hard to the plate during the third inning of her game Tuesday against the Mustangs. Her pitching befuddled Mustang batters who could manage only two hits. She recorded eight strike outs, dominating her city league arch-rivals in the 8-0 shutout.”

We have more of the story and the word choice – ‘comes hard’, ‘befuddled’, ‘dominating’ etc. - shows rather than tells the reader what happened.

3. Organization.

Organization is a necessary consideration in writing an introduction or an essay. A well-organized piece puts events in a logical and easy to follow order that keeps the reader’s interest. The organization ties the writing together into a focused and unified piece that comes to a logical resolution. The most often used organizational pattern is sequential where one event leads to another and so on to the resolution. Another pattern of organization is to use a single, overriding element as a touchstone throughout the piece.

Below, in what would serve as a brief (approximately 225 words) introduction to the photography, the events are presented in order of occurrence and the weather is the touchstone.

“The only thing wrong with this year’s Founder’s Day celebration was the gray sky overhead that kept temperatures down and threatened rain at any minute. It was almost cold as the bands and other marching units arrived at the staging area to get ready for the Fireman’s Parade. Band members complained about cold fingers having to play even colder instruments but all seemed to warm up not long after the parade started.

Stepping off on time, the parade was led, as always, by the American Legion Color Guard followed by the Citizen of the Year and the junior high band. While the parade was winding its way through town, the finishing touches were being put on the homemade game booths that lined the ‘midway’ at Community Park. As the high school band, always the last unit of the parade, arrived at the park proudly playing the school’s fight song, the festival was declared open and people started to pour in from the parade route.

Ignoring the weather, kids raced to the small carnival ride area while still bundled-up grownups mingled. And then came the real signal that Founder’s Day had started… the cooking of the Polish sausage for the sandwiches that everyone looked forward to every year. The aroma defied the heaviness of the day and began to envelop the park with its magic.”

4. Fluency.

This is probably the most subjective of the six traits. The fundamental question to be answered here is whether or not the content flows easily and freely, allowing the reader to move through the writing without difficulty. Are awkward or confusing word patterns or constructions avoided? Is jargon that might slow the reader avoided, if possible? The real test of fluency is simply how does it sound when read aloud?

5. Voice.

This trait is closely linked to fluency in terms of subjective evaluation. The basic question to be answered by this trait is very simple – does this read like something I would write or does it sound like I am trying to imitate someone else? Another way to think of evaluating this trait is ‘is this how I would say something’?

6. Conventions.

Of the six traits, this is probably the easiest to look at as it is absolutely objective. This trait looks at the execution of the writing including correct spelling, correct punctuation, correct grammar, etc. Having significant errors here can be a real deal breaker for the reader.

*The "Six Trait Writing" system was developed by Northwest Regional Educational Laboratories, Portland, OR

Writing Captions

Caption writing is an art unto itself which is why it is addressed here by itself!

The-photograph-stands-alone crowd notwithstanding, every photograph "published" needs a caption. In this case our definition of "published" is very loose. It includes photographs posted to social media, photo sharing sites, "professional portfolios", books (either print or digital), magazines (either print or digital) ... just about anywhere really.

The purpose of the caption is to give the reader information that puts the photograph in context, provides additional information that is not readily available from the photograph and amplifies and extends the reader's understanding of the photograph.

But beware – captions are astonishingly deceiving. They are short and because they are short folks feel that are easy to write.

Often, we get a caption that simply restates the photograph. This is especially true if it starts out "pictured here..." or ends with "poses for a photograph".

And then there are the captions that drift off into discussions of what the photographer went through to "get the photograph" or the equipment and various settings that were used to "get the photograph". None of these discuss the context or fulfill the true function of the caption.

Following are three examples of captions that add to the information provided by the photograph. In all three the subject is identified but in a way that adds information to the photograph and that explains the subject. There are supporting details in the captions that help to explain the relevance of the photograph to the reader.

In each of the three examples on the following pages a complete description of the photograph is given to show the depth of analysis of the various elements in the photograph and how that analysis is not carried over into the caption. The analysis also includes some assumptions made about the content based on the visual semantics.

In the photograph below, we see two people seated at a table in what appears to be a public situation – we assume this given the other people in the photograph and the "wall of windows" designed to encourage people to look out at something. They are wearing name tags so it would be safe to assume they are part of a larger group. Given the table card in the lower left advertising a desert, it would also be safe to assume that the setting is some kind of restaurant. The time of day is unknown. But these facts from the photograph are about all we know or can deduce.

Consider the photograph with the caption:

A family friend's photo is the only one of Mom and Dad celebrating Dad's 80th birthday with a bus trip to Bowie Raceway. The track restaurant surprised Dad with a small cake after lunch. He enjoyed the racing and the cake (which he shared with Mom, of course!). The trip was part of the Senior Celebrations program at their church and they honored Dad's birthday by waiving the admission fee for both him and Mom.

In the photograph below, we see an old car parked on a patch of grass in what is obviously a rural setting. Given the visible condition of the car, it appears to be well maintained. Given the patch of what appears to be gravel in the lower left of the photograph it could be assumed that this photograph was taken with the car simply pulled on to the side of the road. Given the angle of the shadow relative to the car, it appears the photograph was taken around midday. The specific location is unknown.

Consider the photograph with the caption:

Cousins Mike Leopold, Bill Leopold and Sarah Jackson restored Uncle Jacob's 1963 Ford Futura after discovering it in the back of the barn on the family farm. While Mike and Bill did the mechanical and body work, Sarah handled all the restoration chores for the interior. The project lasted two years and was finished in time for Jacob's 75th birthday celebration.

And finally, in the photograph below, we see an old bridge crossing what appears to be a long-dry river bed, canyon or arroyo in a minimally inhabited area. There are telephone or power poles scattered in the distance and there is some type of structure visible in the upper left. The bridge appears to be a single lane and the road surface leading away from the bridge appears to be dirt. There appears to be a road taking off to the right just past the bridge as well. It appears to be a desert setting.

Consider the photograph with the caption:

This single-lane bridge at Canyon Diablo, AZ, was part of an early alignment of Route 66, allowing motorists to safely cross the canyon. The highway alignment and bridge, which to this day is used by local residents, was later replaced, bypassing both the canyon and a popular tourist stop known as Two Guns.

Many caption-writing tutorials will urge keeping the caption as short as possible so we could have "Mom and Dad at Bowie Raceway", "Uncle Jacob's old car restored" or "The Canyon Diablo Bridge". And while we might have a name or an identifier for the subject, we have little else.

The object here is to make the caption part of the message or story that gives the reader a well- rounded understanding of the subject. In that vein, the length of the caption is not the issue – within reason.

Some publishers/newspapers/ magazines limit captions to a certain number of words in the belief that if the caption gets too long, the information should be contained in a story that would reference the photograph. This doesn't always work. While length is not a hard-and-fast issue, captions should be kept under 120 or 125 words.

Supporting details included in the caption should not be obviously stated in the photograph. To say that Mom and Dad were seated at a table would be redundant. Unless there is something specifically unique about the paint or the color of the car, to say it is red is redundant. To say the bridge is concrete is redundant.

The related information included in the caption is designed to give the reader context for the subject.

Just like the essay or the introduction to the project, remember, the key to writing a good caption is to be concise.

Subject and Supporting Details

The subject is, far and away, the absolute, 100%, most important consideration in making a photograph.

Period.

Full stop.

There may be other considerations, but the subject makes or breaks a photograph right from the start.

It's what the photograph is about.

Pure and simple.

Some considerations --

The subject must be tangible. That is, it has to reflect light. While your topic may really be the relationships between people, it is the people in the photographs who are demonstrating those relationships. We see it in their faces, their body language, etc. So, in reality, the subjects here are the people.

The subject must be readily or easily identified. It doesn't have to be the largest thing in the frame, but it has to be easily identified as the subject. It's the "what" in "what the photograph is about." It has to be clear, concise, coherent and the reader shouldn't have to search for it in the frame.

Because photographic subjects exist in the real world, placing them in their real context is critically important. A portrait has a totally different context if done in a sterile studio

rather than in the subject's natural or normal environment. The context of the photograph gives more information about the subject and a better idea of what that subject is all about.

It bears repeating that in presenting the subject, and the project, the photographer translates all of his or her perceptions, ideas, impressions, understandings and appreciations of the subject into the project and, therefore, into each photograph in the project.

Let's say there are two photographers… one sees the automobile as a necessary evil and the other as a liberating device. The first may show the city streets, choked with cars lined up bumper to bumper not really moving and people dodging between them. If the light is right, the photographer might get the clouds of exhaust fumes rising above the gridlock. The second may show the automobile cruising along an open road that's free of congestion, convertible top down, under a sweeping, bright blue sky. Both are photographing the automobile, but from drastically different perceptions, impressions, appreciations and understandings.

The most important time for the photographer's expression is when the subject is being evaluated and a little planning goes a long way to ensure the subject is captured with the expression that tells the subject's story.

This evaluation includes the subject itself, of course including the best viewpoints, the best perspectives, etc. Most importantly, this includes an evaluation of the best way to present the subject. This may take some 'time and walking around' and assuredly more than one photograph.

When evaluating the subject, here are some of the things to consider:

- Is the subject being presented appropriately in terms of the story?
- Is the subject being presented clearly as the subject?
- Is the subject presented in an appropriate context for the story?
- Is the lighting appropriate to your presentation of the subject?

This is not a checklist but more an awareness.

Considering these points helps assure the subject is presented clearly, concisely, coherently and appropriately both in and of itself and as part of your overall project.

While the subject gives the photograph its structure, the supporting details flesh it out and give it its context.

Imagine a park. There are the standard grass, trees and cement walkways. In the background there's a shopping center and a parking lot. Cars are passing by on the street. There are a few people seated on the benches.

This is obviously a small park in a city setting. We don't know if it's a large city or a small city, if it's in the city proper or a suburban area, but it is in a developed area.

Imagine another park. This one has all of the standard features of the first except the shopping center in the background is replaced by houses and the street is devoid of traffic. There's a large swing set and play area visible. The houses in the background

appear to be farther away from the camera than the shopping center was. There are a number of people in the park, mostly mothers or fathers with young children. This is obviously a larger park in a residential or suburban setting.

Now, imagine a third (and final) park. In addition to all of the standard features of the previous example, we see that the houses in the background have been replaced by ball fields and a stand of trees farther back. It appears that the streets visible in the first two parks have been replaced by well-manicured grass and walking paths. There are a number of people in the park, ranging from mothers and fathers with children to senior citizens. All of the details certainly point to a much larger park.

In each of the three examples, the subject is a park, but the details of each certainly give a much different impression of each of the parks in question.

Another example:

Imagine a photograph of a modest, three-bedroom ranch style home in an established residential area. The lawn is well manicured and the cement driveway leading to the garage is well swept. There's a tree on the right side of the scene. There's a walkway leading to the front door. The home is brick and has wood accents. The background appears to be a moderately wooded area. The scene is under a blue sky with puffy white clouds.

Now imagine a photograph of another modest, three-bedroom ranch style home in an established residential area. The light-brown rock in the front yard is well defined and the cement driveway leading to the garage is well swept. There's a grouping of small cactus on the right side of the scene. There's a walkway leading to the front door. The home is stucco with wood accents. The background is predominantly rugged mountains with little vegetation. The scene is under an absolutely clear blue sky.

Obviously, both houses are fairly similar in size and basic location, each being a "modest, three-bedroom ranch style home in an established residential area". But here is where the supporting details take over. The first home could be almost anywhere from the Northeast to the Northwest but the second home is obviously somewhere in the Desert Southwest. The supporting details help locate the home.

When evaluating the supporting details, here are some of the things to consider:

- Do the supporting details help convey the context of the subject?

- Have the supporting details been pared down to only those necessary?

- While paring down the supporting details to only those necessary, have enough been included to maintain the context of the subject?

Again, this is not a checklist but more an awareness. Considering these points helps assure the supporting details are presented clearly, concisely, coherently and appropriately for the story so the reader can understand the information contained in the photograph.

The real question here is how to manage all of the supporting details that come with a subject. Which details serve the view of the subject and which don't – that is, which details do you want to emphasize and which do you want to minimize? Which details

help tell the story or get the subject's story across? There are no pat answers to any of these questions.

The idea is to take the time needed to study all of the aspects of the scene, not just the main subject. Be prepared to make adjustments. Moving a step to the left or the right could make all the difference in the world. Moving in a bit could help. Moving out a bit could make improvements. Making the photograph from a low viewpoint or a high viewpoint could dramatically change things. Include more detail, include less.

In the end, the subject and the supporting details will make or break the photograph. It takes a bit of time and a bit of effort to develop the evaluation skills needed, but, with practice, they build on themselves.

Intelligent Composition

Photography embraces a number of approaches to composition. There are approaches on top of approaches. There are approaches that are systems. There are systems that are approaches. There are "sure-fire" approaches and there are "guaranteed" systems. Most of these are cookie-cutter methods that are more interested in the system than in the photograph being made.

In reality, the composition of the photograph MUST reflect the subject's story being told.

There are three fundamental principles of composition that have to be remembered. And these are directly from the Six Traits:

- Selection or element choice: This is what to leave in and what to leave out. If we leave too much in, the photograph can become confusing. If too much is left out, the photograph can be sterile. With either extreme, relating the subject's story suffers (from Trait 2).

- Clarity of subject and supporting detail: The subject is unambiguously stated and the supporting details narrow it. The details provide additional information, set the context and create the visual layers that involve the reader (from Traits 3 and 4).

- Recognition of the significance of the subject of the individual photograph within the flow and context of the overall project. (from Traits 4 and 5).

These three concepts work together to tell the subject's story. In a "tight" composition all three elements work together to communicate a concise, coherent message. If one element is removed or diminished, the photograph loses some of its impact. Which then means that the project loses some of its potential impact.

While what to photograph is a personal decision, there are some things to consider when figuring out how to photograph the subject:

- The Center of Interest (Subject): assuring that the center of interest is appropriate for the overall project and is appropriate for the photograph contributing to that project. This is the most important consideration of composition. The center of interest certainly does not have to be the largest thing in the frame or be in the center of the frame, but it clearly needs to be the "main thing". It has to be what the photograph is about.

And, to repeat and reinforce an earlier concept, here is where the photograph goes well beyond simple restatement and becomes a very personal statement. This center of interest incorporates the photographer's perceptions, impressions, appreciations and understandings of the subject. After the center of interest is determined, the supporting details narrow the presentation.

- Simplification: This is the process of winnowing the supporting details to just those necessary to support the subject within the context intended. Too few details can lead to boredom and uncertainty while too many details can lead to confusion. There is a fine line in any composition – what to leave in and what to leave out – when is it too much? when is it not enough? This is always ultimately determined by the subject's story being told.

And here is where we deal with the idea of "less is more". This is a theory of photographic composition asserting that the fewer elements there are in the frame "the better". This is very true, but only to a point.

If the selection process puts too much in the frame, the impact of the subject can be diluted or diminished. We have seen this over and over again. But if too little is put in the frame, we lose the context of the subject and it becomes boring and isolated.

- Pictorial areas: There are three pictorial areas in a photograph- the foreground, the mid ground and the background. In traditional composition theory, the foreground is the "front" area of the composition leading into the mid-ground, where the subject is located. The background forms the back drop for the subject. All three areas can provide information about the subject.

- Framing: Poor framing can kill an otherwise excellent photograph. This can include distracting elements in the background, foreground or at the edges of the frame. How many times do we concentrate so hard on the subject that we miss the telephone pole at the edge of the frame, the power line that cuts through the scene, the tree growing out of the person's shoulder, a floating tree limb intruding in the edges of the frame, signs, parked cars, people who happen to wander in the frame, etc.? The object here is to frame the photograph carefully and include only those elements in the photograph that support the subject. When considering a shooting angle, make sure you look at the subject, the background and foreground and then check all four edges of the frame.

- Viewpoint: This refers to the angle of the camera in relation to the subject. A high viewpoint places the camera above the subject and is often considered to be an observational position. A normal or eye level viewpoint places the camera at a height relative to the subject that would be considered a normal standing position. A low viewpoint is from below the subject and is sometimes used for dramatic impact.

Viewpoint is not to be confused with our point of view which is how we perceive and thus present the subject.

- Visual distance: This is the apparent distance from the camera to the subject. A long shot or an establishing shot is an overall view of the subject and the environment around the subject. A medium shot eliminates some of the environment- this is somewhat tighter than the long shot. The medium tight shot removes more of the context and begins showing more subject detail. A close up or an extreme close up of the subject removes virtually all context.

Whatever you do about “composition”, whatever your approach is… always remember that the photograph has to reflect the message. Your photograph might be beautifully composed but if it does not advance the subject’s story, it certainly won’t work in your project and may even detract from its overall impact.

Editing The Photographs

We often inaccurately refer to “photoshop work” done to individual photographs as “editing”. That’s more adjustment than anything else. For our purposes here, editing is the process of selecting photographs for the final presentation of our project.

Big warning – editing is neither quick nor easy (even for experienced editors) …

Big hint – don’t try to edit the project until you have all of the photographs.

To start the editing process go through all of the photographs looking for ones that are obviously not going to make the grade technically. These could be ones that were poorly exposed, poorly focused or have other, obvious technical flaws. Get rid of those photographs. Literally – delete them. Hopefully there will not be many (especially if you are using your phone camera)!

Those who use a raw file format need to take special note here – when judging the photograph for exposure, color balance, contrast, etc., you should not use the raw file. At the very least, bulk process all of the raw files to jpegs or tiffs to give you corrected photographs and do your editing from there.

Now the editing process to select the photographs for the project begins. As you start, remember that you are looking for the photographs to include in the project not ones to exclude. This is positive or inclusive editing.

To begin this part of the process, the first round of selection will be to select the photographs creating a universe of those that might be included in the project. As this is not the final cut you will be selecting more photographs than you need. All of these are the “maybes”. The next step is to walk away from the project for a little while. Give yourself a break. Go do something else. Then come back to the project.

The second selection round will be from the universe created in the previous process will be a lot more exacting and you will need to be a lot more critical. You will need to make sure each photograph selected strongly supports the project and each other. These are the “probables”. The next step is to walk away from the project for a little while. Take a break. Go do something else. Then come back to the project.

Now comes the third and final selection round. This is from the photographs in the “probables” universe. You are going to be absolutely ruthless in the selection of photographs that show precisely what you want to show. After this selection process, you should be down to the photographs that will be used in the project… but you’re not finished…

The next step is to walk away from the project for a little while. Give yourself a break. Go do something else. Then come back to the project.

After getting all of the selection done and determining the photographs you want to use, the next step is to look at the flow of the work. Does each lead logically to the next? Does each follow logically from the previous? If not, rearrange them until they flow appropriately for the story. If this doesn't work, you might want to select a different photograph or two or add a photograph or two to improve the flow of the story.

The next step is to walk away from the project for a little while. Give yourself a break. Go do something else for a while. Seriously, maybe take a couple of days before you come back to the project.

The final step of the editing process is to go through the photographs once more and make sure they appropriately tell the subject's story and are sequenced properly to tell that story based on your perceptions, impressions, appreciations and understandings of the subject.

It can't be stressed enough that with the exception of the very first cut where you were throwing out photographs that do not make the grade technically, this editing process is entirely and completely positive.

You are not looking for the photographs to be eliminated… you are looking for the ones to be included.

You're not looking for the photographs that don't tell the story… you are looking for the ones that do.

And once you are finished with the editing, once your project is complete, it is ready to be presented however you intended. (Please see the section appendix for a further look at this.)

The Theory Behind This

The photography-as-art question has been discussed, debated, argued – and, yes, proselytized – for more than 100 years without a clear resolution. At the slightest suggestion that maybe there is some room for disagreement or at least compromise, the yes-it's-art brigade launches into full attack mode with a take-no-prisoners approach. The no-it's-not group generally doesn't offer much of anything in response so as not to keep what they see as pointless fulmination continuing until the end of time.

But, just perhaps, the problem isn't so much with the answer as it is with the question…

We live in a world of classification. Everything has to be put in a defining container – left/right, car/truck, health food/ junk food – you get the idea. So rather than assuming photography–as–art and arguing from the assumption, perhaps we need to re-frame the question by asking what photography truly is and what art truly is.

For the purpose of this discussion, we need to go to the root or essence of both art and photography. Often, when we boil complex or emotionally charged issues to their essence, the realities and/or resolutions become astonishingly clear.

Unlike photography which has a relatively simple and well-agreed definition – *Creating images by capturing reflected light using a camera* (common) - art has a number of

wide-ranging definitions. It seems one of the best and most encompassing is - *The expression or application of creative skill and imagination, typically in a visual form such as painting or sculpture, producing works to be appreciated primarily for their beauty or emotional power* (-Oxford Languages) Some definitions use the same or similar language but add the qualifier *by the application of the hand*.

The important part of this definition comes in the last dozen words *producing works to be appreciated primarily for their beauty or emotional power*.

Based on this, art is concerned with the creation of aesthetic objects and, at its root, is inherently representative and interpretive while photography, which is directly creating the likeness of a subject by using reflected light is, at its root, inherently declarative and specific.

In artistic production, the artist creates a representation of a subject. Regardless of how "accurate" the rendering of the subject, it is still a rendering by the artist and not a view of the actual subject or object modeled during the production of the work.

When the artist is creating a painting of a landscape, for example, he or she can choose to eliminate or add elements to the painting *as the work is being created*. In essence, this capacity allows the artist to render (represent) the scene as he or she wills it to be (interpretation). When painting a portrait, the artist can change the background, add or eliminate jewelry, change the color of clothing the subject is wearing, etc., again while the work is being created and again this is the ability to represent and interpret that is inherent in art.

In this, the artist transforms the canvas, paper, cloth, etc., being used for the rendering into the aesthetic object or the "work appreciated primarily for (its) beauty or emotional power".

Conversely, the photographer does not have the same ability. He or she can certainly select the scene being rendered but as the photograph is being created elements can neither be added or eliminated, colors cannot be changed, etc. It should be noted here that some camera manufacturers have included the capacity to adjust both white balance and color temperature in some camera models. This capability is significantly different from being able to change a portrait sitters shirt color from red to green as the photograph is being taken.

In the photograph, the photographer creates (declares) an exact likeness of the subject and the presentation is of that specific object.

The argument could be made — and has been made – that post-processing can handle all of those "needs" for artistic representation and interpretation but to do so would alter the photograph to the point that it is no longer of the scene or subject selected. It is the scene the photographer wishes would have been there.

Art is about aesthetic objects while photography is about telling the story of the subject. Neither art nor photography is "superior" to the other. They are simply different.

In fairness, we have a long history of folks trying to define photography as art. Whatever the justification or rationale, it still holds that if there is no representation and interpretation, it simply isn't art and again, this is about as judgmental as saying that if the game has four bases in a diamond pattern it isn't football.

Often the definition of art will be turned into more of a description as the elements of color, line, shape and texture are added. Some go even further adding form, space and value to the description. So, the description of art now reads – *The expression or application of creative skill and imagination, typically in a visual form such as painting or sculpture, using color, line, shape, texture, form, space and value in producing works to be appreciated primarily for their beauty or emotional power (by the application of the hand).*

This description expands the concept of creating an aesthetic object, enhancing the representative and interpretive aspects of art but doesn't include the declarative and specific aspects of photography.

To give a similar expansion to the definition of photography, taking it to the descriptive level, we would need to add the concept of the light captured being reflected by an existing physical subject. So the description would now read – *Photography is the method of recording the image of an object through the action of light or related radiation on light-sensitive material.* (-Britanica)

This enhanced description of photography solidifies the declarative and specific aspects – *recording the image of an object* – while being silent on the representative and interpretive aspects needed for the creation of art.

There are several seemingly popular ways to try and circumvent this essential reality – and don't forget this is a discussion of the essences as originally produced.

The first is simply adding a qualifier such as "artistic" or "fine art" to the word "photography" in the belief that simply changing the name will make it so. And while some may believe this re-branding, it is simply that – re-branding. This is similar to major film manufacturers re-branding their products – the film was the same as before just the name, the box and the sales pitch were different.

The second circumvention is to evaluate the work based on the set of commonly accepted conventions including exposure, color, print quality, focus, tonal balance, etc., with nothing more than a nod to content. While these characteristics are more definable and measurable than simple re-branding, they simply do not get past the representative and interpretive tests. And evaluating photography based solely on the conventions – focus, exposure, color, etc., is like evaluating a book based on its paper, type face and binding type.

And finally, there is the all-embracing, all-inclusive, blanket circumvention of "intent". That is "I created this fine-art photograph to have it appreciated for its beauty and emotional impact and to have this fine-art photograph certify my fine-art bona-fides." Of course, the concepts here are (first) if I say it enough times it will be true and (second) the actual ideas of "fine art" and "fine art bona-fides" are so ambiguous and poorly understood in this context that just about anything along these lines will suffice as an unarguable defense. And yet, it is still lacking the fundamentals of the representative and interpretive needed for true art.

So, if photography is not art, what is it?

Well, first of all it is photography but beyond that it is a form of writing.

Over the past 40 years or so, significant advances in how we communicate have shown photography to be a form of language and the photograph to be the written expression of that language (as discussed previously in this paper).

For years we have divided the ability to communicate into two broad categories – verbal expression and written expression. The verbal side of the equation covers the ability to speak and listen – to use verbal signs (words, inflection, volume, etc.) to transmit meaning from one person to another. The written expression side uses graphic signs or symbols (letters, symbols, images, etc.) to transmit meaning.

Written expression is also a way to record and transmit verbal expression – think sending a text message or an email instead of making a (voice) phone call – now think about how many times you have opted to send a photograph in that text or email because it was a more accurate expression of the subject than a purely textual based communication. If these two points are taken together, it's clear that photography is not only a language but is also a form of writing.

It's important to note here that textually based expression relies on signs that are words and symbols to express content while photographic expression relies on signs that are objects to express content.

The language of photography involves effectively aligning the signs (objects) within the defined frame so the photographer can effectively express (encode) the purpose of the photograph and enable the reader to understand (decode) the photograph's meaning.

When we speak or write we use specific words to get our meaning across (semantics). And then there is a logical sequence to those words – one after another – to get our meaning across (syntax). And finally, there is the understanding of those words based on the context in which they were spoken or written and in which they was heard or read (pragmatics).

In photography, the semantics and the pragmatics are essentially the same as in verbal and written expression – we include specific objects in the frame and the understanding of the photograph is based on the context of both the photographer and the reader.

The difference comes in the syntax. In verbal and textual communication words are presented as a sequence, one after another, while the information in the photograph is presented in its entirety.

This difference demands the photographer construct the syntactical structure which defines the meaning of the photograph.

What this fluidity shows is that the photographer encodes the photograph with a particular meaning as it is being created and the reader decodes that meaning within his or her particular context.

In order to refine the meaning of the individual photograph further, the photographer may provide additional photographs, as a writer may provide additional paragraphs, which mutually refine each other *and* refine the overall encoded meaning. This mutual refinement is a natural part of the language of photography.

So rather than the representation and interpretation of art, in photography we have the semantics, syntax and pragmatics from writing. These are essentially the declarative and specific aspects of the medium.

The concept of photography as art has been around in one form or another almost since the introduction of the medium and was heavily advanced after the introduction of the "hand camera" in the very late 1800s when professional photographers saw their incomes and standing threatened. One of the leaders of that movement, Alfred Stieglitz, used his magazine "Camera Notes" to proselytize the art position and help gain acceptance for photography.

But in 1923, Stieglitz wrote, "My photographs look like photographs and they therefore can't be considered art." He never tried to cover up or explain the change in his thinking but it was clear there was a significant rethinking of his earlier position.

Even a dramatic change of heart by one of photography's king-makers couldn't turn the momentum of the photography-as-art movement around and the impression has remained generally unchanged.

But…

With today's advances in photography, we see more and more that the true essence of the medium is not in the art world but in the realm writing.

Reading Photographs

With photography akin to writing, it seems we have to change the way we consume photographs. Bluntly, we need to read them and not simply view them.

With the development of the "photography-as-art" movement in the 1890s — or maybe even a bit before that — we began treating photographs the same way we treated paintings – after all both went in a frame or were pasted to a board, both hung on a wall, both were hawked in galleries or ritzy private salons. We were viewing photographs the same way we were viewing paintings (and we keep doing that for some reason!).

But photographs are not the same as paintings and the way we consume them has to be different. We need to stop viewing photographs and start reading them for the subject's story.

Viewing is, by its nature, passive while reading is active. When we read, we are actively engaged with the material at hand.

It doesn't make any difference if it's a text book for school, a newspaper reporting the events of the day or a novel we're reading for pleasure. It doesn't matter if it's text-based, image-based or a mix of both. When we read, we are actively pursuing the information contained. And, when we start reading photographs, we stop being "viewers" and we become readers.

Because of the normalization of viewing photographs, we generally begin with an evaluation of the overall conventions… that is how does the image "look". Does it conform to current "sensibilities". Sometimes there's a cursory mention of "the scene" or

the composition of the photograph but generally we are more concerned with the appearance of the work than the information contained.

And this leads to the non-specific comments of “nice capture”, “very nice”, “beautiful view”, “great work” or similar broad, nonspecific affectations of approval. More often than not, the appreciation of the work stops there. Whether a simple or complex image, much of the time it boils down to summing up the photograph as a “pretty picture” and moving on to the next.

Obviously, this is not where the understanding of the photograph should end or, realistically, even start.

It needs to be stated clearly that what follows is not a formal assessment of the photograph but rather a way to read the subject’s story as it’s being told by the photographer.

The place to start reading the photograph is in determining the subject. This is the “what-it’s-about” determination, the “what’s-the-substance” judgment. Once we have the subject, we look for the supporting details that flesh out that subject.

The photographer’s responsibility is to give us, the readers, the syntactic structure necessary to understand the work. There was (and maybe there still is) a movement in photography to allow the reader to determine the meaning of the photograph. This wholly undermines the photographer’s view of the subject and basically reduces the photograph to an empty vessel.

Sometimes the syntactic structure is completely contained in the photograph allowing it to “stand alone”. We get this structure not only in the clear and unambiguous declaration of the subject but in the clarity and relevance of the supporting details and their relationship to the subject. These elements become clear as we read through the photograph. We get this level of structure sometimes. That having been said, we still need a context setting caption or title.

But then sometimes the photograph doesn’t supply the entire syntactic structure and needs a bit of help in the form of an explanatory title or a concise caption. Again… sometimes. Of course, here we have the strongest possible expression of the subject’s story. The photographs and the text work together, providing the reader with as complete a perspective as possible.

Unfortunately, more often than not, the syntactic structure is simply not addressed and we are left to guess at the purpose of the photograph. The ultimate conclusion of this guessing game is “okay, it’s a pretty picture… moving on”.

The next area of consideration for reading the photograph is its context. This is sometimes included and is probably the most important bit of information outside the syntactic structure. But the photographer has to give this to us – we can’t just divine it out of thin air. Sometimes the photographer will state the reason or reasons for making a particular photograph or a particular series of photographs. This is like having the introduction to a book opening things up for us.

Other times, unfortunately, a photographer will use the “context” to explain how hard it was the get the photograph, how far he or she had to walk, that they battled the elements or what they carried in their camera bag. Then there are times the

photographer might simply indicate the photograph was taken to test some new technique, a new camera, a new lighting system or some accessory. None of these truly contextualize the photograph nor are they extremely helpful in reading the photograph.

Sometimes analysis of the composition is included as part of reading the photograph but, in reality, the composition is part of determining the relationship between the subject of the photograph and the supporting details. The composition is, as it should always be, serving the syntactical structure.

Materials and processes used in making the photograph may be important for an archival study of a photograph but if you are trying to read an image on line it's usually next to impossible to determine either. The photographer may list the make and model of the camera used and even less often list the software used to process the image but that makes little difference to the content or context of the photograph.

It would seem the only time materials and process would impact the reading of currently produced work is if the photographer is using one of the historical processes – carbon printing, platinum or palladium printing, gum bichromate printing, etc. And then both the process and why it was selected would rank with context.

Again, this is not a formal assessment of the photograph but rather a way to read the subject's story as it is being told by the photographer.

Very simply, the more complete the information we have, the more complete the story is. And the story is at its most complete when we have the all of the semantics, syntax and pragmatics at our disposal.

To sum up all of this very simply – photography and writing are the verbal and written expression components of the storytelling. It is the storytelling itself that is the "art".

Section Appendix - Publishing Your Work

Right off the top, the first assumption here is that you are looking to get your work on the internet…

The second assumption here is that you are looking to do it on your own website but you don't have one yet…

There are any number of website builder services on the internet that will allow you to create a website and publish your photographs… services like Wix, SquareSpace, Weebly, Web.com, GoDaddy, Google Sites, etc. And there are any number of portfolio building services that will do the same… services like Pixiset, SmugMug, Pixpa and Zenfolio.

Some of these site builders are easy to use while others are more complex. Some are free, other are not. Some have a free service but also offer "premium" paid service. Some give you a free subdomain (web address) while others don't.

The emphasis here is to publish concise, coherent and unified "photo series work".

With all of the choices available for publishing, it is obviously well beyond the scope here to get into a discussion of presenting a finished, internet-based, photo series. Work can be presented as a "page-turning" book using a content management system or as a

scrolling, single page website built on a drag-and-drop editor. Both are competent building systems but one is a bit more beginner friendly.

As you look for a place to publish your series keep a few things in mind…

First is the issue of cost and the next question to ask is if the service is a full-service provider – that is can you build your website and have it hosted there?

Next, make sure that whatever service you choose allows you to build a website that is responsive to all of the various screen sizes that are out there. This goes from the large desktop monitors down to the display on your phone.

Here is where an understanding of what exactly "responsive" means for photographs and how to work with it. For a photograph, the responsive process looks at the photo's width and if it needs to be reduced based on the display screen. The other thing you need to understand is that there are a number of different approaches to making a site responsive so the best thing to do is test… test… test. The other part of that testing is to make sure you can include the introductory text at the start of the series and the captions with each photograph.

Finally, look to see if the service will allow you to use the design you want. Simply put, some services try to overwhelm you with the sheer number of templates offered. The question is, though, given the number of templates available, is there "the one" you want to use?

After that, what are the restrictions? Here are a few of the more popular ones -

Do they restrict storage? Do they restrict bandwidth? Do they restrict the number of connections over a given period of time? Are there any ads on your pages? Is the free service good only for a period of time – like an introductory offer? Is there support of some kind if you get in trouble?

The next question is what does the service provide to help you design, build and publish your site?

Before you start building your website, especially if it's your first crack at it, you might want to do some research on the process you will go through. Search the web for "How do I build a website using (Fill in the name of the service here)" or "Beginners guide to (Fill in the name of the service here)". If you limit the results to the last month or the last year, you should get some solid advice on how to build your website using the current version of the service provider.

And just remember… after you get your site the way you want it, you still have to promote it… more web research!

The key is writing stories people want to read

In a world oversaturated with images and advice, one principle remains: write stories people want to read. Not trendy topics. Not technical showcases. Stories that come from your passion – stories that invite the reader in because of your passion – are the ones that linger in a reader's memory. That's the heart of photo-authorship.

If you research online, you will see a lot of different ideas about the "how" and the "when" and the "why" of storytelling and, while a lot of that information is both helpful and valuable, the most important trait by far is writing stories that people want to read.

This doesn't mean picking the most popular subject or one reflecting whatever the current focus of the photography media is, it means writing your story-- the story of your subject – in a way that piques someone's curiosity and invites them to keep reading.

And before we go any further, there are a lot of ways to describe "putting the story on paper". Here we're calling it "writing" because that is exactly what we are doing – whether putting it on paper or online – we are using the synergy of two languages, text and photography – to tell the subject's story as completely as possible.

The photographs give us "what" the subject is – down to the finest detail, color shading and texture. The text gives us the "why" and the "how" about the subject.

The synergy of photography and text in three separate examples:

The photograph shows a woman sitting behind a wood desk with a protective glass top and all of the expected details – a telephone, "in and "out" baskets, a desk blotter, a few files, papers arranged in a neat stack, assorted pens and pencils in a small holder, etc. Behind the woman is a credenza with photographs under a large abstract painting hanging on the light-colored wall. While all of this is great and sets the scene, the text fills out the story. "Mayor Melanie Jackson of Hallondale signs the recently passed ordinance authorizing the city to begin construction of the new Fred R. Rebilot Elementary School. Mayor Jackson said the construction of the new school will start immediately and it will hopefully be open in 24 months. The new school will serve grades K-6."

The preceding is very much a news or current events photograph. Here's another one for you to consider:

The photograph shows a rocky butte rising well above the ridge of a range of mountains. There is no vegetation showing on either the butte or the mountains. In the foreground is a free-flowing blue-green river. There is some riparian vegetation along the shoreline and, as evidence of development in the area, power lines run along the base of the mountains. The sky is that lighter blue of the desert morning. But we get the rest of the subject's story from the text. "Cupcake Mountain, a butte named for its distinct shape, is a well known landscape feature in Lake Havasu City, AZ. Located just across Lake Havasu in California's Whipple Mountains, it rises approximately 2400 feet above the water's surface. A favorite with climbers, a local climbing group, The Leaping Lizard Tribe, once scaled the butte, lighting the summit with a number of red road flairs arranged to resemble a birthday cake for the city's annual birthday celebration."

But let's say the subject is an 18-year-old high school senior who needs to get her portrait done for the yearbook:

Amanda Snelling can either have her yearbook portrait taken by the school-contracted photographer or can hire a photographer and submit a 4x6 photograph with a short write up. She chooses to go with you as the photographer. Rather than taking the photograph in a sterile studio environment the choice is made to be more "creative" and

shoot the portrait “on location”. Amanda is an up-and-coming folk music performer who has already established herself locally and plays in a number of the “coffee houses” around town. The portrait will be taken on the stage of the “coffee house” where she first performed. She will be seated on a 30” stool holding her Martin guitar (her favorite) dressed in an outfit she wears when she performs. Hair and make-up will be done by a local stylist. Lighting will match the stage setup used during her performances. We get the rest of the story from the text. “Amanda Snelling has attended Central High School since freshman year. She is a talented musician and vocalist holding down First Chair Guitar in the Band’s Acoustic Group in both her Junior and Senior years. Amanda will be attending Hallondale Community College, majoring in Music Theory before transferring to the State College Fine Arts Performers program.”

The product that comes from combining photography and text is truly greater than the sum of the parts (which is the definition of synergy) and when spread over a photo series or book creates as complete a telling of the subject’s story as possible.

Here is the big but… it has to be written in a way that gets people to read it.

In order to get to this point, we (photographers) have to recognize that the world is – and has been for some time – simply overloaded and oversaturated with images. The single photograph, regardless of how striking it is, will only hold a viewer’s attention for so long.

Here is the however part of the argument…

When the photograph is part of a “final product” that moves folks from simple, passive viewing to engaged, actively reading the work is that much more impactful and therefore memorable.

What this boils down to is holding the subject as the story and not the photograph… the photograph contributes the telling the subject’s story. And in this transition, we move into the arena of photo-authorship meaning photographers become storytellers.

In essence, we become the active curators of that subject’s story – and not just passive picture-makers.

The question is where to start.

The opening photograph and caption must grab the reader’s attention and begin answering the reader’s basic question: “What’s this all about?” That question becomes the throughline for the work — each image and caption should deepen the answer, guiding the reader through the subject’s story. Likewise, the introductory essay must do the same – it helps set the tone, spark curiosity, and cement the reader’s engagement with the story.

Everything that follows—text or image—builds on this foundation until the reader arrives at a satisfying conclusion to the subject’s story.

To make sure everything leads the reader to understanding the subject’s story – to make sure the story “works” - after you finish, proof read both the photographs and text. Make any necessary changes. And then put it down for a few days. Come back and read it again to make sure it still “makes sense”.

Finally, put it down for a few more days, come back and read it out loud. This is the true test to see how well the work "works". If you have someone you trust, ask them to read it and get their comments. If you are truly brave, ask them to read it out loud. If all is good, your story is ready to publish.

Remember, this isn't a portfolio or a genre showcase. It's not a scrapbook of loosely connected snapshots. It's photo-authorship—an intentional, authored narrative that tells the subject's story with clarity, curiosity, and care. It is authorship about your passion. It could be about doing portraits of community leaders and getting their comments for the sesquicentennial of the town. It could be about antique steam-powered farm equipment or it could be about top end super cars. It could be about the landscape of the local regional park or it could be about the birds inhabiting your area.

Whatever the subject, stick to your passion — you'll stand a far greater chance of connecting with your intended readers.

One of the most enduring and best examples of photo-authoring is the 1948 story "Country Doctor" by W. Eugene Smith appearing in the Sept. 20 issue of Life magazine. It is still available at the Life Magazine archive site: https://www.life.com/history/w-eugene-smiths-landmark-photo-essay-country-doctor/. One of the advantages of going to this site is that we get to see all of the photographs and captions in the story as published but we also get to see several photographs and captions that were edited out of the published story showing the curation applied.

One thought before ending -- We study the work of other photographers to inform our own work, and reading does the same thing—informing both our writing and our photography. We talk a lot about light, composition, and framing, but if there's one unspoken shortcut to better photography, reading just might be it. It's not about literary flair — it's about both expanding and refining our ability to see, to interpret and to tell. The best photographers I've taught were often the best writers. And the best writers were always the best readers.

Impact: A real-time guide to using your smartphone camera to its full advantage

By 2021 smartphone camera makers moved en masse to computational photography, eschewing the mechanical, pixel-driven, single-shot camera systems that had gone before. The smartphone camera system became, and continues to be, the most advanced and reliable mass-market photographic system ever designed. As such, it is an imaging system that requires some changes in the approach to "making pictures".

The problem is that any number of sources continue to treat the smartphone camera as that mechanical, pixel-driven, single-shot system from the now-distant past. Here is the practical, real-time guide to using the smartphone camera --

The first thing to realize is that the smartphone camera has five modes that give you the full computational process. These modes are Photo, Night, Portrait, Burst and Panorama. Using the “Pro” mode built into the stock camera app on an Android phone or a third-party camera app on either an iPhone or an Android phone pulls the photograph out of the pipeline very early in the process, defeating all of the advanced technology, giving you inferior output.

Note: Many modern smartphones now include AI-powered editing features such as object removal, generative expansion, and image reframing. While these tools may be useful, this section focuses on creating the strongest possible photograph at the moment of capture using the smartphone's computational photography system.

Smartphone camera systems can handle the trickiest lighting situations, highly articulated and complex scenes, finely detailed materials or the subtlest of color shadings because they are not relying on a fixed processing sequence but rather on flexible computational recognition of the scene in total and an interpretation of what is needed to give you the best rendering of that scene. In a sense, these camera systems “know” what they are looking at and “understand” that they are tasked with giving you the best photographic version of that scene possible… on their own.

The other thing to understand is that the image the camera is showing you on the display is a lower resolution preview and not the final, fully processed photograph. Not that the image will be drastically changed in the final output but the imaging process will refine the photograph for the highest quality output possible as it is being processed.

A full range photograph taken with an iPhone 15 Pro Max in Photo mode handling highlights and shadow appropriatly.

In conventional photography a lot of time and effort is given to setting the correct exposure. This includes everything from setting the ISO to adjusting the shutter speed and aperture, working back and forth between the exposure meter and the histogram. And it’s almost as time and effort consuming if you are using either shutter priority or aperture priority.

When you are in any of the computational photo modes on your phone you needn’t worry about setting an exposure level as the system handles all of the scene assessment.

The photograph above was taken using an Apple iPhone 15 Pro Max in Night Mode.

This includes setting ISO, the shutter speed and all of the other parameters while the preview image is appearing on the display. (Don't forget that the aperture is fixed on smartphones although there have been some experiments with a two-stage variable aperture.)

The smartphone camera is a multi-frame system meaning it almost instantly takes a number of different frames of the scene at different exposure levels to use in constructing the final photograph. The final output is a composite of all the frames taken. That compositing happens from the global level to the granular level.

As the photographer, you can control the entire system with the screen tap. By tapping the screen at any specific point in the composition you control both the focus and exposure reference point. This is the element in the composition that keys the exposure and most often this is an area in the highlights you want to preserve.

The second screen tap function is the tap and hold. This gives you an auto exposure / auto focus lock so you can recompose the photograph but keep the focus and exposure at the point set by the tap.

The second issue is the range of focal lengths offered.

The photograph above, of the lens board, lens and exposure controls of a 1913 Kodak Folding Pocket 3A camera was taken handheld with an iPhone 15 Pro Max at a distance of about 3 inches.

The photograph above was also taken hand held, with the same iPhone 15 Pro Max set to its maximum zoom, a 35mm equivalent of 667mm. It appears the old zoom-with-your-feet adage is no longer an issue.

The issue, however, is no longer just how far a telephoto can reach or how close you can get. It's the range of focal lengths the particular camera system can cover with acceptable results.

Both preceding photographs are more than just usable. While the balloon photograph has some noise issues, you still have significant detail, to the point you can see the texture of the weave in the basket carrying the pilot.

Note that both photographs were taken in the camera's Photo mode.

The fully computational output of the system is a JPEG file. This is not just JPEG compression applied at the end of the processing, simply squishing the photograph to a preselected size. The system is aware of the JPEG output very early in the processing pipeline and optimized for those constraints. This assures that the image is fully tailored for that "wrapper". Dynamic range, tonal mapping, global and local HDR mapping, global and local contrast assessment, color accuracy based on the preview, noise reduction, etc., are all done with "acknowledgment" that the fully formed JPEG format is the system-standard computational output and the fully formed photograph needs to fit completely in that "wrapper", from deepest shadow to brightest highlight and every range in between.

Smartphone cameras will provide "raw" files but with several caveats. The ProRAW file from Apple is not a traditional raw file. It has some processing applied including demosaicing, noise reduction, local tone mapping and lens corrections. The computational raw file from the Google system is also partially processed. Samsung, Motorola and other Android-based smartphone systems, provide a straight DNG for the raw file, bypassing most of the computational advantages.

A major advantage of the fully formed JPEG comes in the post processing area where most of the adjustments made are minor tweaks Much of the work that once happened later in Photoshop or a RAW editor now happens automatically inside the camera before the photograph is even saved. As a result, the exported JPEG is often already a fully finished photograph. If adjustments are needed for some reason, they are only minor presentation adjustments rather than the wholesale bludgeoning needed for RAW data.

The further implication here is for the software and the work station. Because much of the processing labor has already been collapsed into the capture system, a heavy desktop or laptop workflow is no longer necessary. Meaning that much lighter software such as FastStone Image Viewer or digiKam can be used for processing and hardware requirements are significantly eased as well. To put it bluntly, you no longer need a Hollywood-production-class work station.

In short, because much of the processing labor has already been collapsed into the camera, the photographer's job is no longer to manually construct an image from raw technical data but to recognize moments, organize compositions and direct the camera toward the story being told. What all of this means is you have far more time (and energy) to concentrate on the actual storytelling in your photography!

Impact: You really don’t need all that stuff for post processing

One of the advantages of the fully formed JPEG output of a smartphone computational camera is the total shift in post processing. The smartphone photograph is a finished product ready for use in almost any situation. If there is any adjustment needed it is usually a small, global “tweak”.

The photographs shown here were all taken in May 2026 using three different camera systems, eight with the original Apple iPhone (a pixel based, fixed processing camera, 37mm equivalent, producing a 2megapixel JPEG file), eight with a Samsung Galaxy S7 (an early computational camera system, 26mm equivalent, producing a 12 megapixel JPEG file) and eight with an iPhone 15 Pro Max (a fully computational camera system, 35mm equivalent, producing a 24 megapixel JPEG file). All of the photographs were taken at the same place, and at the same time and at the same distance to the subject.

All pretty standard stuff so far… here is where it gets interesting from a workstation / workflow point of view…

All of the photographs had any needed processing done on an HP 625 laptop…

…not recognizing this as a current or recent model? The HP 625 was released in 2010 with an AMD Athlon II processor running at 2gHz. This is a two-core CPU with limited cache, no hyper-threading, and an extremely limited GPU in its Radeon HD 4200 graphics system. The laptop has 6gb of integrated memory.

Obviously not a candidate for a modern version of Windows, the system is running the latest release of the Linux Mint Xfce operating system, using KDE's digiKam as the processing software. digiKam is a free and open-source photo management and processing software that will run on Linux, Windows or Mac. It should be noted that the optional AI components offered after installation were not installed.

This absolutely low-power system had no difficulty at all dealing with the 2mp files from the original iPhone or with the 12mp files from the Galaxy. There was a one or two second hesitation opening the 24mp iPhone 15 files but that was the only issue. During processing all instructions were carried out instantly and, according to the Psensor monitor software, the system never broke a sweat as processor temperature never got above 60 degrees C.

And while we are seeing more ‘large-number’ sensors out there – 50mp, 108mp, 200mp – 12mp is still the de facto output standard for smartphone photography, with most systems pixel-binning down to that range. Apple is the acknowledged outlier at 24mp, but only in its main camera.

The upshot of all of this is you don’t need a monster Hollywood-size workstation or even a new system. Your five-year-old laptop with the right setup will do just fine for the foreseeable future.

As you look through the photographs that follow, please remember that any adjustments were made in keeping with the camera system’s character. Apple tends to be more conservative in its processing and display, gearing its processing to the widest possible

range of displays while Samsung is more aggressive and tends to gear its output to the phone's own display.

Original iPhone

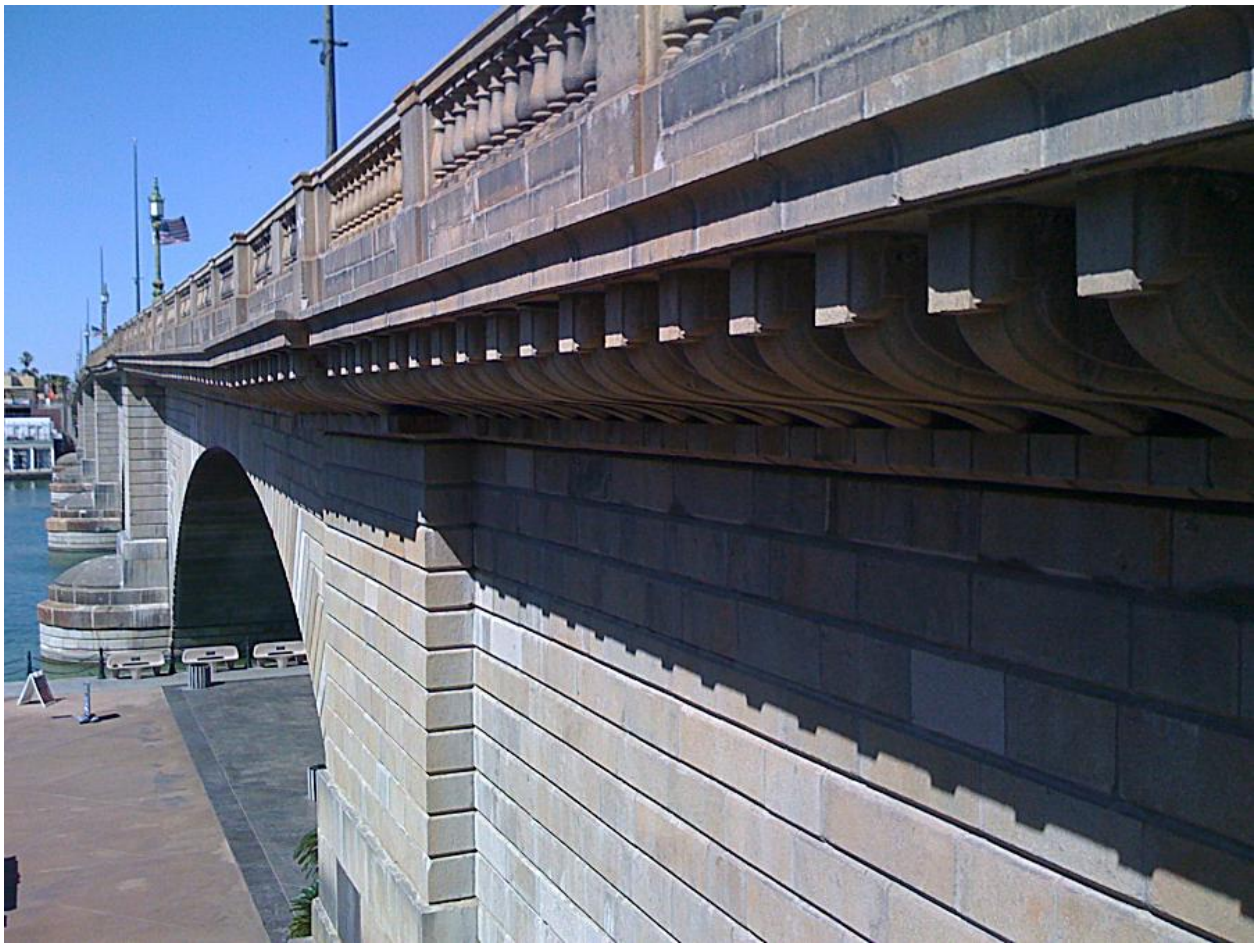
Galaxy S7

iPhone 15 Pro Max

Original iPhone

Galaxy S7

iPhone 15 Pro Max



Original iPhone

Galaxy S7

iPhone 15 Pro Max

Original iPhone

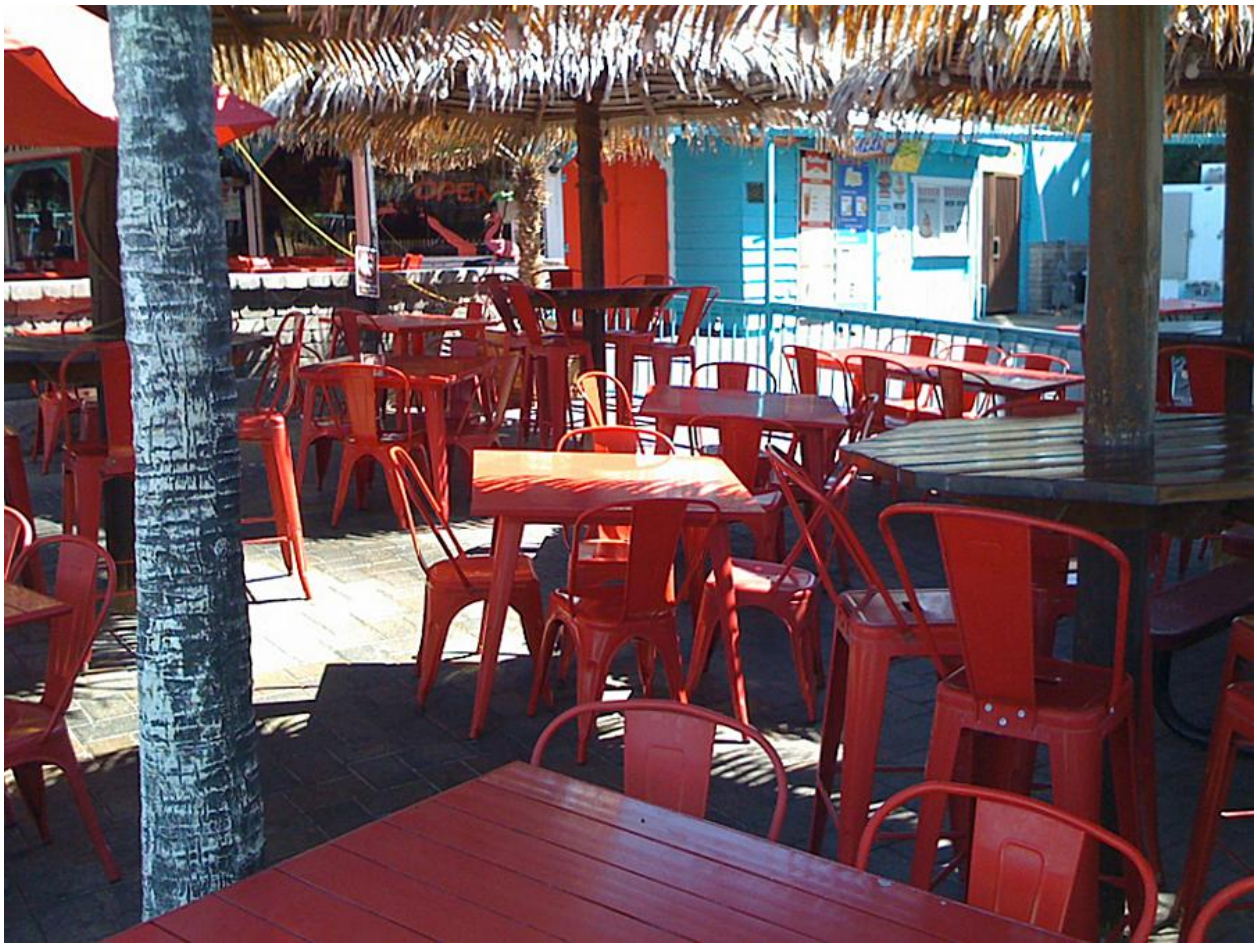
Galaxy S7

iPhone 15 Pro Max

Original iPhone

Galaxy S7

iPhone 15 Pro Max



Original iPhone

Galaxy S7

Phone 15 Pro Max

Original iPhone

Galaxy S7

iPhone 15 Pro Max

Original iPhone

Galaxy S7

iPhone 15 Pro Max