Through a Different Lens

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Through a Different Lens

by

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Abstract

An engineering education lends itself to a rigorous and narrow college experience, with a multitude of courses all focused in a particular field, providing very little freedom to learn more than numbers and methods. Like many other modern careers, the focus upon performance sacrifices one’s ability to step back and appreciate the world around them. Often caught up in shaping the world around ourselves, we miss the innate beauty and masterful design in what’s already here: nature.

This capstone project takes a step back, aiming to create a photographic portfolio inspired by the world around us and presented through a unique perspective. Aiming to represent my unique perspective on art and photography, this portfolio is a foray into the world of infrared artistic imaging, sampling a world that none can see. The discussion of the dichotomy of man and nature, inspiration, composition, and selection will all be examined for each piece.
Introducing Infrared

I always wanted to draw, but my coordination was awful. I always wanted to paint, but was always afraid to mess up. Music was moderately successful because I could hold a hell of a bass line, but I could only dedicate so much time to learning complex rhythms and techniques while preoccupied with an engineering education.

Then I found photography. Optics. Light. Chemistry. Math. Physics. I finally found an art that my numerical brain could wrap my head around. An art founded in science where technique, laws, and logic came into play. I fell in love with photography because it let me capture the world around me and then alter it as I saw fit, drawing emphasis to the things I like, allowing me to share them with others, and show my perspective.

Photography, in my opinion, is all about sharing the world with others and showing what's there from someone else's perspective. Whether a classic artist or famous photographer is portraying the story through their blue-tinted world, or an astrophotographer is showing what the sky looks like to a more sensitive eye, it's all about sharing a different perspective. Because of that, I've always appreciated grandiose photographic works, ranging from the impressive views Gursky puts together from perspectives we can't quite ever step back to see, or the hundreds of once in a lifetime views that Tin Man Lee captures.

Putting my own touch on this art, however, proves to be a much greater challenge. I strive to produce unique work that truly can showcase a separate view or a new perspective, and venturing into the infrared spectrum is exactly the shift I was looking for. The infrared spectrum is the next step of light in the electromagnetic spectrum for wavelengths wider than the human eye can see. Most of us can only see up to around 700 nanometers (the end of visible light), the dark red end of the visible spectrum. Digital infrared imaging is taking a look at what exists.
beyond this spectrum, using a variety of equipment such as modified camera bodies and thick infrared filters that block out any narrower wavelengths. While there's a wide range to infrared too, artistic infrared remains rather close to the visible spectrum, as all of my work was captured around 720 nanometers and wider, right on the border of the visible spectrum. Infrared imaging can go much, much higher but wavelengths upwards of 800 to 1,000 nanometers are nothing but the black and white short wave infrared. This is still well below thermal infrared ranges (think military night vision), which goes into the several thousand nanometers.

By photographing this nearby wavelength, I can capture my subjects in a realistic world where light still behaves almost as we expect, with shadows still appearing in realistic levels and contrast is maintained. However, visible light isn't what makes up the picture anymore. It's now infrared. This means substances that may normally be dark, such as the rich green of forest leaves, are instead quite bright as leaves reflect infrared wavelengths incredibly well. Normally highly reflective water that shows up quite brightly in a typical camera picture is instead a murky black, for water absorbs almost all infrared light.

Now my photography, my scientific art, my physical process, my mathematically perfect color science has another layer to it. I found infrared photography a remarkable combination of science and art, bringing the unique behaviors of a typically invisible wavelength into the artistic world of a new perspective. What better method than infrared, for an engineer such as myself, to bring my portfolio to life? With no answer, I decided I would begin, using infrared imaging to develop a portfolio delivering a new look to the world around us.
Capturing The Moment

A little known fact about most modern cameras is that they can see a lot more than the human eye. A matter of fact, most digital cameras can see the visible spectrum and its entirety, a significant chunk of short-range infrared, and a significant chunk of wide-band ultraviolet. However, all these light sources that we don't want in our picture are destructive or distracting and would muddle up the visible spectrum if we tried to cram it all together. To deal with this, each of these cameras have a pair of ultra thin specially treated glass inserted on the digital sensor. These are cut filters, specifically infrared in ultraviolet cut filters, specially manufactured optics that filter out most wavelengths above (like ultraviolet) and below (like infrared) the visible spectrum.

If we want to photograph these spectrums, we need to find a way to capture that data with these handicapped devices. The first option is the classic answer of throwing money at the problem: with the right tools, capabilities, and specialty pieces, that annoying cut filter can be removed and a simple picture you take now includes the infrared spectrum. The second option is that of patience. The aforementioned cut filter removes most of the infrared spectrum. Not all. Given a long enough exposure (the period in which the camera captures light on its sensor to produce an image), you can still capture sufficient infrared data to produce a picture.

Regardless of the method you choose, the problem of too much information to the sensor becomes quite problematic. Like previously mentioned, introducing the visible light spectrum and the infrared spectrum together would just produce a bright image because of all the different wavelengths, so we need to cut out the spectrums we don't want again. This is done with a new filter to be added on to the lens of the camera that functions almost opposite of the infrared cut filter in the camera. This new filter will filter out everything above infrared light (such as visible
light and ultraviolet), ensuring your camera only receives infrared wavelengths. If you have opted to remove the infrared cut filter, your camera now functions as normal with the exception of shooting specifically in the infrared spectrum at or below whatever wavelength filter you have installed (such as the 720 nanometer I have made my portfolio with). If the cut filter remains in your camera, you can still use that infrared filter to produce an image, however light reaches the sensor at a much, much weaker strength, forcing long exposures to be used to make up for the lack of light.

Long exposure photography is its own unique art form, with many wonderful capabilities being introduced alongside many critical drawbacks. When the camera sensor takes a sixty second exposure like all of my infrared photos were, the image is an average of the light from the scene over those sixty seconds. That means anything walking, moving, or driving through your scene virtually disappears, as it occupied whatever space it was in for a relatively insignificant amount of time. In a similar manner, natural motion from trees blowing in the breeze or waves rolling across water are all averaged out. This makes it near impossible to shoot pictures of any living being, as natural motion from respiration, blinking, and the inability to hold perfectly still would throw nearly any picture out of focus. However, new possibilities are opened up, with long exposure emptying crowded streets, smoothing rough water, and streaking a stationary sky. This unique appearance is actually a step back to the earliest days of photography, with Louis Daguerre’s photograph of the empty Boulevard du Temple capturing a long exposure view of a busy Parisian street from the year 1838. The long exposure emptied the entire street, with the exception of the silhouette of a lone man standing still, getting his shoe shined.
On the bottom left street corner, the small fuzzy silhouette of a man who remained for the entire five minute exposure impressively became immortalized as the oldest photograph with a person in it, despite every other cart, person, and animal disappearing from the busy Paris street.

Every photo in the following portfolio was made with a sixty second exposure, with the camera seated somewhere on a tripod, perfectly still, unable to see the nearly invisible scene in front of it. Focusing was trial and error. Composition was a prayer. Understanding what the final product would look like is a mystery of material science and artistic vision that was a learning experience through this whole process. I hope you enjoy this challenge.
The Portfolio

This portfolio was designed and delivered in the spirit of a standard photographic art portfolio developed for a capstone, the usual product of the ARS 450 course this was developed in. It consists of seven images, six to be developed into complementary 11” x 14” prints, and a seventh large format print, the center of the portfolio, printed out at a full 33” x 44”. Topics intended to be portrayed include an emphasis upon nature, discussions of society, and the artistic merit of this form of photography. Each image will be introduced as appropriate on its own page with an explanation of the work and a discussion from the artist’s perspective. Regardless of the listed interpretations, though, each viewer is encouraged to develop their own meaning and takeaways. The most accurate interpretation is that in the eyes of the beholder.

The images themselves are all infrared long exposures with a 720 nm filter. Editing for each was done to shift the data (generally nothing but red light and darkness to our eyes) back to the visible spectrum, as well as an accompanying channel swap between the red and the blue channels to align the colors more closely with what we would naturally expect. This is a fairly simple and standard process to produce a false color piece, and is similar to other false color pictures, such as images produced from space telescopes or industrial imaging.
Getting Over It

No longer do we have to worry about the depths of the river impeding our travels. No longer do we need to be concerned about the ecosystem running through the woods. A dozen concrete pillars driven into the silty depths and a thick black scar reaching across from bank to bank, here we are defying the flow.

This piece shows the expansive sky and Tennessee River stretching out as far as the eye can see, bisected by the man-made concrete and steel monstrosity of a bridge. I saw this opening image as a strong piece highlighting the world of difference between the flowing nature, softened by the long exposure, and the dark, stationary, stoic bridge.
Sore Thumb

Infrared imaging with channel swaps produces brilliant white foliage, striking blue skies, and gray undertones. And then there's red. Red is the unnatural color. Red is the color of something that doesn't belong. Red is the color of the old man-made storage building that doesn't fit in the blue and white nature.

This lonely storage warehouse struck me as an unusual addition to this nature trail, its rough texture and dark color standing out among the foliage and soft sky. It was an unusual and vibrant element in the world of infrared and worked compositionally well. The structure acting as a leading line to the small but noticeable pathway leading off into the forest further as a possible deeper meaning and leaves room for interpretation.
A Breath Of Fresh Air

Smooth. Untouched. Unblemished. Letting the river flow, the sky drift, and the forest breath. This smooth, empty expanse is an untouched glimpse into nature. The haze of the sky as the clouds drift by shows the passage of time, while the glass of the river shows nothing but the massive expanse of water it truly is.

From an artistic perspective, I appreciated being able to capture these two massive bodies of blue, the air above and the water below, divided only by the dark pink stretch of riverbank and island. The small channel marker can indeed be noticed in the water upon closer inspection, but I chose not to remove this as I felt it was an appropriate addition of society. Instead of being a massive interruption for our utilization, it is a guide to bring us through this natural beauty.
Cotton Candy

The glaring pink of concrete, artificial landscaping, and glass speaks only to highlight the irony of the tropical resort in which this was taken from. Enjoy nature is an ironic advertisement for the corporation who paves over a mile of beachfront and tropical scrub. Yet it brings us closer to the nature many of us are stuck so far away from… Does that make it worth it?

I enjoyed this photo, capturing the bright tropical light and the small snippet of sky peeking out between the not so natural landscaping and hotel rooms. Bright, colorful, and controversial, playing with perspective and light, this photo really shows off some of the unique color profiles that can be achieved from infrared.
Living The Life

Look left. From the water you can see the umbrellas, the palm trees, the beautiful white sands of the beautiful resort. The beautiful wealth and the beautiful enjoyment of comfort.

The orange coastline cutting into the light blue sea, with the horizon barely different, blending those two expanses into one. The sky blurred and the sea evened. I appreciated how much the coastline stood out and the symmetrical framing of this fun piece, but most of all I appreciated the possible dichotomy from its sister piece.
The Life We’re Living

Look right. The ramshackle stores, the dilapidated roofing, the rough trees. A scoffable charter dinghy next to the rocky shore, with this little bold group of local entrepreneurs setting up on the other side of the white sands and the golden resort. Here the bright color ends and the reality begins. Here was where those trying to make a living were instead of those spending it.

I thought this piece was a beautiful antithesis to the previous piece, striking up a variety of contrasts. Whether it was the different land use, the different class, or even the different coloring of the bright metal and dark thatch, this was a beautiful contrast.
Reflections

The beautiful glassy reflection of the clouds in the sky, the dark azures, the rich magentas, the bright whites. This image captures the quintessential blend of our enjoyment of nature, tamed to our own desires. Nothing quite says enjoying the tropical coastline like opting for a pool instead.

I enjoyed this photograph immensely for a wide variety of reasons, ranging from its strong colors to the powerful leading lines and symmetrical shape. With remarkable detail preserved in the glassy water and the stationary foliage, but the sky blurred like all long exposure, this was the seventh and final piece in the portfolio, produced in a large format print almost four feet wide.
Closing Remarks

Through hundreds of pictures, countless experiments, and over four hours of exposures alone, this portfolio has been a learning experience both in terms of photographic skill and artistic vision. While my original project scope intended to have a greater focus on nature itself, I believe this was a thorough and effective response to the initial plan. The incorporation of infrared photography had been floating around for some time when I wrote the initial proposal, but I was initially hesitant to commit to a single type of photography for fear of limitation. However, I believe in the end that this alternative methodology was a critical and fundamental element of the portfolio. I feel this unique twist was a perfect blend of the science I adored and the art I strove to make, truly bringing to light art through the eyes of this engineer.

I am proud of my work and pleased with the final production quality, taking special delight in the ability to print these works out. Seeing this digital art come to life and take a physical form was a wonderful conclusion to the production of this portfolio and a beautiful final step to the visualization of this unique perspective. This pinnacle of the portfolio, Reflections, is on exhibit in the Salmon Library until the closing reception, November 29th, 2023. I look forward to the posting and appreciated crafting my portfolio in this unique manner, Through a Different Lens.