



# FORGOTTEN PRINCIPLES: HOW THE DIGITAL AGE TRANSFORMED THE HUMAN CONNECTION TO PHOTOGRAPHY

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The goal of this paper is to explore the human connection to photography and examine the different principles that have been impacted by digital advancements in photography. This paper will investigate these principles and how they affect the perception of the beauty seen in photographs. The investigation of these principles builds upon Adrian Bejan's acclaimed book, 'Time and Beauty,' and the principles outlined in Constructal Law.

**Keywords:** Photography; Human Development; Perception; Scan; Light.

## 1. INTRODUCTION

Imagine human development as rivers flowing through time. The riverbed symbolizes accumulated knowledge, while the surrounding land represents the various opportunities and challenges human development has encountered. This land can be rugged, filled with rocks and obstacles that redirect the water's course, or it can be smooth clay, facilitating easy flow. The flow of the river signifies the energy invested in a chosen path. With enough flow, the water can cut deep, establishing historic roots, but without sufficient flow, a branch of the river can dry up and lose momentum. Technology functions like a pipeline, transporting our water more swiftly to desired destinations, and providing easier access. However, this comes at the cost of bypassing the natural riverbed, which holds the historical context and experiences of the land traversed. While the destination remains the same, the foundational knowledge imprinted in the riverbed is removed entirely when using a pipeline, altering our connection to the journey and the land left behind.

The pipeline of technology in the realm of digital photography has fundamentally changed the principles that make photography an art and changed the fundamental connection of photography with the human experience. Certain key elements of photography, namely how the light is captured, the aspect ratio of a photo, and the rate of perception of movement, have all been significantly impacted by this evolution. While digital photography has enhanced ease of use and photo quantity, it has also diminished the importance of these crucial factors which are deeply connected to our human appreciation of images. Through the understanding of these critical elements and their change over time, it is easy to see how the beauty and nostalgic feeling of film photography are more deeply connected to the human experience and represent a lost form of art that has yet to be replicated by digital means.

## 2. METHODS AND FUNDAMENTALS

The beauty standards integral to Constructal Law as argued in “Time and Beauty” by Adrian Bejan are most closely supportive of this argument. The following methods described within this law are crucial to understanding the fundamental differences between digital and film photography:

- The medium in which light is captured
- Ratio aspects within film development and digital megapixels
- Perceived digital quantity

### 2.1. Medium for how light is captured

A film negative is created by casting shadows onto light-sensitive film which creates an inverted copy of the captured light. This process is raw and complete, avoiding the pixelation necessary for the coded structure of digital photos and identical to the method by which our own eyes interpret light. Since the negative is an exact shadow-casting of the moment, the quality remains consistent when enlarged through a light projector. In contrast, a digital camera focuses light onto a sensor (CCD or CMOS), converting it into an electrical signal. The sensor's pixels record this signal as a numerical value. These analog signals are then converted into digital data, which is used to recreate the captured light in separate pixels, forming a digital image. When enlarged these digital images lose their quality with size and turn into enlarged pixels. This causes a fractal look throughout the perceived image making it more difficult to discern change.

### 2.2. Ratio aspects

Film photography embodies the beauty standard of Constructal Law by maintaining the standard alignment of natural light as seen through human eyes. Film is shot in 24mm × 36mm dimensions, resulting in a more desirable 2×3 ratio, and offers a natural composition that is more easily and naturally scanned by human eyes attuned to this aspect ratio. In contrast, digital photography often reverts to the 3×4 ratio. This is most common in the digital photos taken by iPhones, which are encoded into dimensions of 3 024–4 032 pixels.

### 2.3. Perceived digital quantity

Saccades are small eye movements that occur within human eyes 3–5 times per second, allowing them to thoroughly scan our surroundings. Film photography requires more than a second to capture and rewind each photo, and allows for multiple saccades per photograph, making each one anatomically memorable. The limited quantity of film encourages thoughtful composition and intentionality. In contrast, digital photography captures images at shutter speeds faster than 1 millisecond, outpacing the 200–300 millisecond duration of

saccades. This rapid capture rate allows for more photos than our eyes can naturally process, making the act of taking photos effortless, less deliberate, and artificial.

### 3. DISCUSSION AND CONCLUSIONS

Contrast is defined as the change in time over the photo. The speed at which we perceive and understand an image depends on how quickly our eyes can discern the elements and actions within it. With film photography, this perception of scanning is a little more at ease since film isn't fractal. Negatives, in the context of film photography, don't have megapixels in the same sense as digital images. This gives a smooth transition from different changes in time of the photo just like in nature; Bejan himself even states that "Nature is not fractal. Every image is full, a continuum with distinct features distributed nonuniformly"<sup>1</sup>. Film, being a faithful replica of light, embodies this nonuniformity, enabling each photo to exude a natural and seamless aesthetic. The quality intentionality put into each photo allows for thoughtful shots that are remembered along with the moment. Furthermore, the preferred 2×3 aspect ratio of film facilitates swift comprehension of the perceived image, adding to its natural appeal.

The distinct principles underlying film photography contribute to the beauty and nostalgia associated with the art itself, which is deeply similar to our human interpretation of light and imagery. Digital photography, with its ease and lack of intentionality, can create a sense of time distortion. Many people feel they didn't fully "live" the moment because they were busy capturing it on their phones, experiencing the event through 2D megapixels rather than real reflections of light. This disconnects, along with a loss of understanding in how to take meaningful photos, has caused many to forget the fundamental purpose of photography: capturing each specific, beautiful, and intimate aspect of a moment.

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### REFERENCES

1. Bejan A., *Time and Beauty: Why Time Flies and Beauty Never Dies*, Harper, 2017.

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<sup>1</sup> From Bejan, Adrian, *Time and Beauty: Why Time Flies and Beauty Never Dies*, Harper, 2017, p. 45.

