



Problems of Compositional Decision-Making in Fine-Art Photography in the Era of Digital Technologies

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Abstract

This article examines the transformation of compositional decision-making processes in fine-art photography under the influence of digital technologies and algorithmic tools. The study aims to provide a comprehensive analysis of the evolution of compositional practices from the constraints of the analog era to digital abundance, as well as to identify the key factors that define the contemporary visual discipline. The relevance of the work is justified by the exponential growth in the volume of images created and the dominance of smartphones, which shifts the creative burden to subsequent stages of processing and complicates the task of preserving the artistic integrity of the frame. The novelty of the study lies in the integrated application of five methodological approaches—ranging from historical-technological analysis to social-media content analysis and case studies of the implementation of Adobe's generative tools—and in considering artificial intelligence not only as a generator but also as an analytical instrument capable of verifying compositional decisions without supplanting the author's vision. Digital freedom and algorithmic automation mean that composition has a new center of gravity; it no longer resides at the moment of the shutter but instead in sorting and filtering. Accompanying this is cognitive choice paralysis and the stylistic conformism it induces. Slow photography, previsualization, printed output, and AI-driven analytical tools are proposed as practices that can help recover intuition—not simply a return to “intuitive” rhythm and balance but rather a means by which to consciously reestablish feeling for rhythm and balance. This article will be helpful for researchers of visual culture, practicing fine-art photographers, and instructors at photography schools.

Keywords: Composition, Fine-Art Photography, Digital Technologies, Post-Selection, Generative Artificial Intelligence.

INTRODUCTION

The number of images produced is growing exponentially: according to Photutorial, by 2025, people will take approximately 2.1 trillion photographs—about 5.3 billion per day—and 94% of them will already come from smartphone cameras (Growcoot, 2025). Consequently, the volume of visual flow and the simplified access to shooting sharply increase the significance of preliminary compositional decision-making: the easier it is to press the button, the harder it becomes to select a frame that possesses artistic integrity.

Whereas in the analog era, the scarcity of frames and the cost of errors disciplined the photographer, digital abundance and post-processing have shifted the creative workload from the moment of capture to subsequent manipulations. In fine-art photography, composition refers to the organization of visual elements within the frame, aiming to direct the viewer's attention and create a semantic hierarchy of objects. Essentially, it is the art of building an image through framing

(Vorenkamp, 2016). Fine-art photography, in turn, is defined as photography created according to the author's intention and intended to express an idea, emotion, or aesthetic statement, rather than for documentary or commercial purposes.

By digital technologies in the context of this work, we mean the entire production cycle based on photosensitive sensors, analog-to-digital conversion, computational processing, and display output, which enables the capture, storage, and dissemination of images without the need for chemical film processing. Crucially, this cycle is increasingly supplemented by machine learning and generative algorithms, which further blur the boundary between capture and graphic synthesis, complicating traditional notions of the author's compositional responsibility.

MATERIALS AND METHODOLOGY

The study is based on the analysis of 15 sources, including academic articles, industry reports, technical equipment

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specifications, and case studies of developments in machine vision and generative algorithms. The theoretical foundation comprises works on classical principles of composition (Vorenkamp, 2016) and the transition from analog constraints to digital freedom, as well as the publication by Goodfellow et al. (2014), which laid the groundwork for understanding the role of generative adversarial networks in image creation and editing (Goodfellow et al., 2014).

For the quantitative assessment of the dynamics of visual flow and platform shifts, statistical data were utilized, including estimates of image volumes from Growcoot (2025), CIPA analytics on global shipments of digital cameras (Lehec, 2025), and an overview of device distribution among users (Data Reportal, 2025). Information on daily volumes of image sharing in social networks was obtained from Roué (2025). Data on average session durations and publication formats were sourced from reports by Insivia (2024), Kemp (2024), and Social Insider (2025).

Methodologically, the work combines five key approaches:

- Comparative historical-technological analysis of analog (Ilford Photo, 2025) and digital (Ilford Photo, 2025; Vorenkamp, 2016) constraints;
- Statistical analysis of data-volume trends and equipment turnover (Growcoot, 2025; Lehec, 2025; Roué, 2025; Data Reportal, 2025);
- Content analysis of social feeds and algorithmic metrics, including the 9:16 format and engagement dynamics (Insivia, 2024; Kemp, 2024; Social Insider, 2025);
- Case studies of the implementation of Adobe's generative tools—Firefly (Adobe, 2023; Adobe, 2025) and Generative Fill in Photoshop (Adobe, 2024);
- Review of cognitive-psychological research on choice paralysis (Gray, 2024) and reinforcement models in social networks (Lindström et al., 2021).

RESULTS AND DISCUSSION

The shift from analog to digital photographic media revolves around the notion of scarcity: in the film era, each frame was a countable resource, as a 35mm FP4 Plus cassette was sold for a maximum of 36 frames, and each exposure followed lengthy considerations of light balance and the final print. The implicit cost of an error—film, chemicals, and lab time—shaped a discipline of foresight in which composition was born before the shutter release rather than after it (Ilford Photo, 2025).

Digital sensors, which appeared in mass-market cameras at the turn of the 1990s and 2000s, removed this material brake and introduced real-time feedback. The cost of an extra shot dropped to zero. It became the norm for burst shooting: modern mirrorless cameras record tens of frames per second, radically changing the compositional strategy—now the author more often seeks a successful configuration in post-

selection. Paradoxically, freedom has been accompanied by a decline in the market weight of cameras: global shipments fell from tens of millions in the early 2010s to 7.7 million in 2023, rebounding only slightly to 8.5 million devices in 2024, indicating a shift of photo production from specialized systems to other platforms, as shown in Figure 1 (Lehec, 2025).

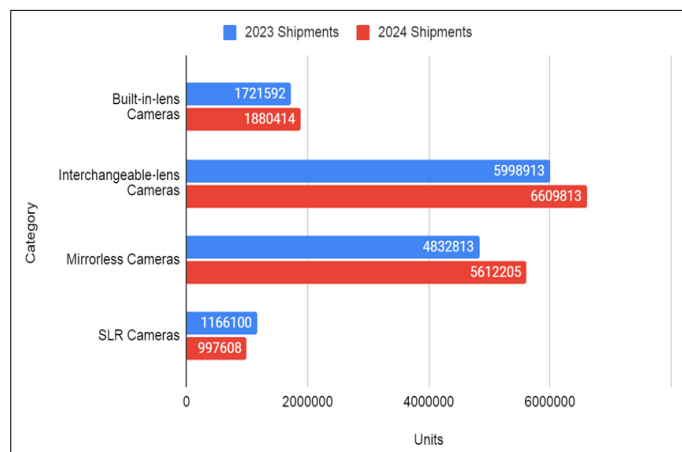


Fig. 1. Comparative Year-over-Year Analysis of Global Digital Camera Shipment Volumes by Category (Lehec, 2025)

The smartphone has become the principal such platform, integrating camera, processor, and publication channel. According to Phototrend's estimate, approximately 2.1 trillion photographs will be taken in 2025, with 94% of these being captured with mobile phones; traditional cameras will account for less than 5% of the global volume, effectively becoming niche equipment for professionals and enthusiasts (Roué, 2025). At the same time, WhatsApp dominates daily image sharing with 6.9 billion images—nearly double Snapchat's 3.8 billion—and significantly outpaces Facebook (2.1 billion) and Instagram (1.3 billion), as shown in Figure 2.

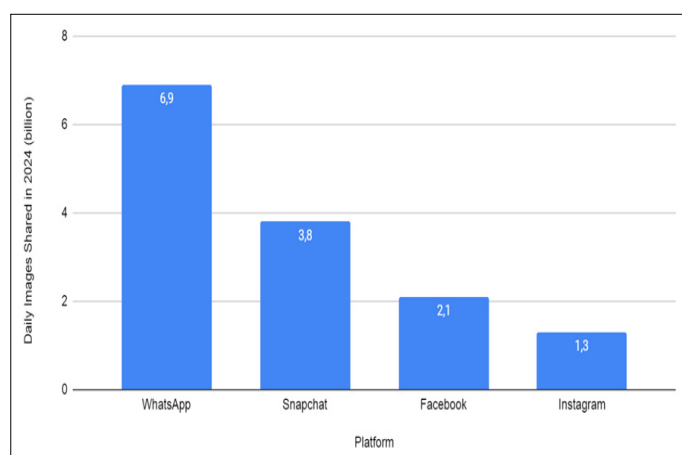


Fig. 2. Daily Image Sharing Volumes Across Major Social Media Platforms in 2024 (Roué, 2025)

The algorithmic feed of social networks dictates new compositional habits: the vertical 9:16 format, emphasis on a central subject, and high local contrast, which increase the visibility of an image in the first few seconds but simultaneously standardize the visual language.

At the fourth stage of evolution, generative artificial intelligence is added to technical abundance. The theoretical foundation was laid by Ian Goodfellow's 2014 publication on Generative Adversarial Networks, where the adversarial generator-discriminator schema for synthesizing photorealistic images was first proposed (Goodfellow et al., 2014). The commercial turning point occurred in spring 2023, when Adobe introduced the Firefly model family, integrating generation and smart content filling directly into Creative Cloud workflows (Adobe, 2023). By mid-2025, these models had already generated over 22 billion images and video clips, expanding the concept of the camera into a cloud service in which an image may appear without optics or a sensor, and composition is formulated by a line of text (Adobe, 2025).

Thus, the historical dynamic shows how the removal of technical constraints has successively shifted the center of gravity of compositional decision-making: from the moment of exposure (analog) to post-selection (digital), then to algorithmic optimization for publication (smartphone/social networks), and finally to generative pre-production, where a frame can be designed before any optics have seen it—if optics are even used.

The unlimited throughput capacities of modern sensors and storage media have radically altered the very structure of frame selection. Almost half of professionals capture 1,000–3,000 files in a single shooting session, turning image ranking from a creative, intuitive act into a labor-intensive selection process that induces the choice paralysis described in cognitive psychology (Gray, 2024). At such volumes, the author's attention shifts from constructing a single completed frame to subsequently filtering a series of shots, and compositional decisions are increasingly deferred to the sorting stage.

The technical simplification of post-processing has reinforced the tendency to shoot now and fix later. During the first eighteen months following the introduction of Photoshop's generative tools, users created over 7 billion images, and the Generative Fill feature was adopted ten times faster than previous popular operations (Adobe, 2024). Automatic background extension, object repositioning, and intelligent cropping provide the immediate illusion of a corrected composition, but at the same time blur the line between intentional mass arrangement at capture and algorithmic optimization after the shutter has been released.

Concurrently, Lightroom has implemented a full HDR pipeline: frames can be captured, edited, and exported with extended dynamic range without leaving the application, which enhances tonal flexibility but further distances the final image from conventional screen brightness parameters, forcing the author to rethink the balance of light and color rhythm in the ultimate display.

Finally, the viewing device itself dictates a new geometry. Users hold their phones vertically 94 % of the time, and

over 75 % of global video and photo content is consumed on mobile devices (Insivia, 2024). The 9:16 vertical format and 6–7" diagonal screens encourage subject centering and close-ups at the expense of peripheral elements, limiting opportunities for complex diagonals or asymmetric balance. Thus, the technical parameters of capture, processing, and display merge into a single technological loop, where each link imposes its constraints on composition even before the photographer presses the shutter.

The growth of visual content outpaces the audience's capacity to perceive it: according to DataReportal, the average internet user now spends 2 hours and 23 minutes in social networks daily, and the total number of active identities exceeds 5 billion, turning the news feed into a highly competitive space for fractions of a second of attention (Kemp, 2024). In this context, fine-art photography does not face a shortage of viewers, but rather their dispersion: a typical Instagram session lasts only 2 minutes and 44 seconds, which devalues complex compositional strategies designed for prolonged viewing and the gradual revelation of visual hierarchy, as shown in Figure 3.

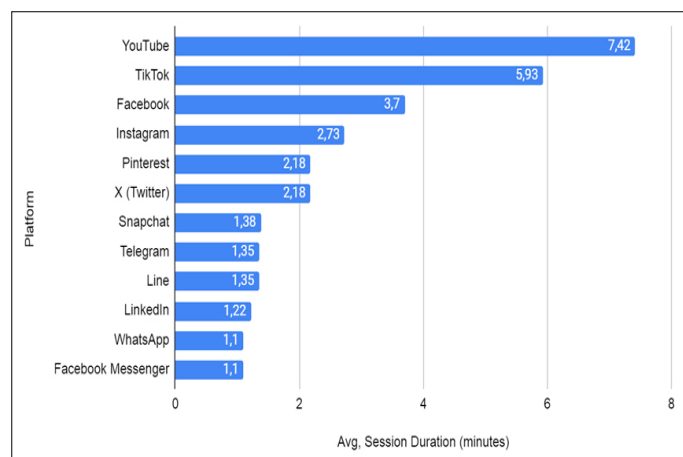


Fig. 3. Average Android App Session Duration per Launch Across Social Media Platforms (Kemp, 2024)

Ranking algorithms capitalize on this brief focus by prompting content creators to compete for instantaneous behavioral signals—such as scrolling, pausing, and reactions. Such an attention economy transforms the frame from a mere visual statement into a participant in a micro-auction, in which victory belongs to whoever captures the gaze most rapidly. Consequently, compositional decisions shift toward close-ups, high contrast, and centering of the subject, which, in the long term, leads to stylistic conformism.

Social-reward metrics provide an additional psychological mechanism. An analysis of over one million posts across various platforms demonstrated that users regulate their publication frequency according to the principle of maximizing social rewards—likes and shares—in precise accordance with reinforcement-learning models (Lindström et al., 2021). When these numerical indicators become the primary success criterion, composition is supplanted by a

strategy of algorithmic reverse engineering: the author seeks not visual integrity but the form that has historically garnered the most reactions. By 2025, a paradoxical consequence was a 28 percent year-over-year drop in average engagement on Instagram, reflecting inflation and growing content depersonalization (Social Insider, 2025).

Finally, the democratization of technology intensifies the pressure of the attention market. As of April 2025, 70.7 percent of the global population (5.81 billion people) own a mobile phone, with smartphones accounting for 87 percent of all active devices, their total number having surpassed 7.4 billion (Data Reportal, 2025). The camera has become an integral part of everyday life, and the entry barrier to photographic expression has virtually disappeared. When everyone is a photographer, uniqueness no longer correlates with device access, and the level of craftsmanship in compositional mastery is diluted by a flood of technically adequate yet aesthetically monotonous images. Thus, the socio-psychological challenges of the digital era—competition for attention, gamification of evaluation, and technological ubiquity—jointly reduce compositional expertise to a single question: can the author overcome the statistics and hold the viewer's gaze for longer than those few seconds?

The constant stream of images forces the author to defer compositional decisions from the moment of shooting to subsequent selection. When thousands of similar files accumulate in the camera, attention is scattered, and the original task of arranging masses and tension points dissolves among an infinite number of variants. Selection timelines extend, the intuitive sense of rhythm fades, and even a well-seen frame is lost in the visual noise.

The dominance of vertical feeds and the neurophysiological center bias encourage a simplified axis-object scheme. Recommendation algorithms further reinforce this choice: an image in which the main motif instantly appears under the viewer's finger receives more immediate reactions. As a result, composition is reduced to mechanical centering, and peripheral elements become extraneous ballast, depriving the frame of depth and asymmetric tension.

Software-based background blurring, designed to simulate optical bokeh, functions as a universal filter, thereby erasing natural planes. A homogeneous, soft-focus paste renders the image flat: the foreground remains sharp, the background appears sterile, and intermediate midtones fade away. The viewer cannot perceive spatial relationships because the smooth digital mask replaces the gradual gradient of sharpness and light.

Processing flexibility transforms the source file into an endless project. The photographer continually returns to already captured scenes, experimenting with a new crop, an updated preset, or the latest version of an AI tool. Every improvement seems definitive, but a week later, another tool promises even more expressive results. The final decision is

postponed for so long that the photograph remains a draft, and the composition never transitions from a process to a finished work.

The abandonment of automatic shooting workflows begins with conscious deceleration. The practice, provisionally termed slow photography, proposes strict constraints: shoot a limited number of frames, use only one fixed-focal-length lens on the camera, and disable instant on-screen preview. Each gesture becomes considered, and the arrangement of elements within the frame regains the weight lost in the era of burst mode. At this pace, the author must once again solve the task of mass distribution before pressing the shutter, rather than during endless post-selection.

The next step is previsualization. Even before arriving on location, the photographer formulates the compositional intent in the form of storyboards, miniature sketches, or sequences of references. This work reminds the photographer that framing is a project, not a reaction to a chance opportunity. When format, perspective, and tension points are predetermined on paper, shooting becomes a confirmation of an already chosen decision; cameras and sensors merely materialize an existing structure.

The printed print returns composition to a material medium, where screen illumination does not embellish contrast and color. The paper finalizes the version of the frame and prevents the author from making endless adjustments to the file. A table of contact sheets makes every tonal and geometric imbalance visible: if the planes are not balanced, the viewer loses the ability to read the image as a whole. Thus, printing becomes the final—but necessary—verification after which the photograph attains the status of a completed work.

As a daily discipline, the exercise one shot—one story, rooted in Henri Cartier-Bresson's practice, is helpful. Shooting is conducted with a single exposure per scene, without the possibility of repetition or correction. This strict limitation develops the skill of instant evaluation of geometric relationships and trains the internal metronome responsible for visual rhythm. Gradually, the photographer ceases to rely on burst duplicates as insurance and begins to perceive composition in real time again.

Finally, artificial intelligence can serve not as a generator but as an analyst. Heat maps of attention, vector diagrams of balance, and automatic detection of golden-ratio intersections help to measure what was previously sensed only intuitively. If these prompts are used before the final crop stage, the author retains control over the aesthetic decision, and the algorithm functions as a verification tool. Such role separation prevents the substitution of the author's perspective with a machine template and anchors responsibility for composition in the human rather than the code.

Thus, the rapid development of digital technologies and algorithmic tools has radically transformed the traditional art of framing, from the strict discipline of analog single-

frame thinking to endless post-selection and automatic composition optimization. As a result, the photographer's attention is increasingly shifted from the moment of capture to the filtering stage, and visual responsibility is blurred between human intent and machine templates. In response to this loss of initial creative awareness, practices have emerged—such as slow photography, previsualization, and printing—that restore the frame's status as a completed work and reinstate the role of intuition in managing rhythm and balance. AI tools, reinterpreted as analysts rather than generators, assist in verifying composition without replacing the author's gaze. Only a combination of conscious constraints, sketches, and the one-shot—one-story principle allows the preservation of artistic integrity in the era of digital abundance. It prepares the audience for a deeper understanding of the image.

CONCLUSION

This study has demonstrated that the radical expansion of technical capabilities for capturing and processing images in the digital era has shifted the center of gravity of compositional decision-making from the moment of exposure to post-selection and automatic optimization. The exponential growth in visual content makes primary framing less a necessity and more an option. When every shot can be effortlessly retaken, the photographer's attention disperses, and compositional discipline loses its accustomed support in the scarcity of frame resources.

The transition from filmic rigor—where each extra exposure cost time and materials—to digital abundance with instant review and an unlimited number of takes removed natural barriers to infinite burst shooting. The emphasis on post-selection and algorithmic correction renders composition the result of sorting and machine processing rather than an intuitive act at the moment of shutter release. In turn, this engenders cognitive choice paralysis and increases the author's dependence on technological tools for final image refinement.

Smartphones and social networks now play a paramount role in contemporary compositional strategies, imposing standards of vertical format, central subject placement, and high local contrast. In the attention economy—where the task is to capture a scrolling user's gaze instantly—complex diagonals and subtle frame architectures are relegated to the background. Recommendation algorithms and social-reward mechanisms encourage authors to engage in algorithmic reverse engineering of successful visual formulas, which over time leads to visual conformism and like inflation.

The advent of generative artificial intelligence has introduced yet another transformational phase: composition can be formulated before capture in the form of textual prompts to neural networks. This pre-production approach erases the boundary between photography and digital synthesis, calling into question the authorship of compositional decisions.

At the same time, automated tools for smart cropping, background expansion, and HDR pipelines continue the parallel trajectory of shifting responsibility from humans to algorithms.

In response to these challenges, practices have been developed that restore the frame's status as a completed work and reinstate the intuitive sense of rhythm and balance. Slow photography, strict limitation of frame count, abandonment of instant preview, and use of a single fixed-focus lens once again place the author before the necessity of deliberate framing before shutter release. Previsualization through sketches and storyboards allows for the predefinition of compositional intent, and printing serves as the ultimate verification of tonal and mass balance. Finally, AI tools, when employed as analysts—such as heat maps of attention and vector diagrams—can confirm the validity of compositional decisions without supplanting the author's vision.

Thus, despite technical abundance and algorithmic automation, fine-art photography retains its essence only through the conscious imposition of constraints and the selection of tools that enhance intuition rather than replace it. The integration of deliberate intent, single-frame discipline, and advanced analytical verification methods enables the author to avoid getting lost in the flow of visual noise and to maintain the viewer's gaze beyond the initial seconds of scrolling. Only such an integrative approach can ensure the artistic integrity of the image in the era of digital technologies and prepare the audience for a more profound understanding of photography.

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