

Seeing Darkness

This contribution proposes a critical and practice-based inquiry into the thresholds between human and machine vision by examining what smartphone cameras “see” when pointed into darkness, optical homogeneity, or environments devoid of discernible visual stimuli. Emerging from an artistic research project, conducted as part of my PhD studies, the work interrogates the perceptual, technical, and epistemic limits of the photomobile black box. Through deliberate attempts to photograph darkness with contemporary smartphone cameras - devices whose imaging pipelines are increasingly defined by prediction, enhancement, compression, and generative automation - the project investigates how machine vision fills visual absence with computational guesses, algorithmic speculation, and synthetic detail. The resulting images reveal sensor noise, digital artifacts, algorithmic hallucinations, and traces of active sensing that ordinarily remain hidden beneath the veneer of visually pleasing, commercially optimized mobile photography.

Rather than treating darkness as a lack - a failed condition for photographic capture - the project frames darkness as an experimental site where the apparatus is pressed against the boundaries of its own resolution regime. When exposed to non-standard photographic circumstances, such as the absence of ambient light or uniform surfaces without contrast, the smartphone camera becomes a generator of unpredictable visual forms. These forms are produced by a range of processes: noise reduction and filtering algorithms trained to interpret randomness as meaningful pattern; multi-exposure stacking routines attempting to synthesize clarity from indeterminacy; machine-learning models that search for familiar shapes even when none exist; and active sensing systems such as LiDAR or infrared laser autofocus, which emit invisible signals into space and register their faint returns as visual cues. Thresholds between signal and noise become unstable, and compression or quantisation steps within the pipeline take on a constitutive role in shaping what is allowed to appear.

Darkness, in this sense, becomes a conceptual void into which the apparatus projects its own encoded expectations about what an image should look like. This void carries both absence and the potential for inscription: an empty field that appears neutral, yet is already structured by the perceptual and computational assumptions embedded within the imaging system. Confronted with darkness, the smartphone camera is unable to leave this field untouched. Instead, it fills it with its own computational priors, noise signatures, and generative approximations, revealing traces of its internal visual logic. These outputs are not mere “errors” but expressions of a specific mechanic autonomy shaped by training data, optimisation routines, and consumer-oriented aesthetic biases.

Methodologically, the project combines experimental image-making, phenomenological observation, and theoretical analysis. I produced a series of photographic studies by directing a Huawei P30 smartphone camera into conditions that violate the assumptions under which its imaging pipeline typically functions: photographing sealed darkness, extremely low-light environments, blank surfaces, and empty space. By blocking the lens completely, I was able to capture the raw dynamics of sensor noise and the interference patterns of the phone’s autofocus lasers, which appear as chromatic bands or structured pixel clusters. In other scenarios - such as pointing the camera into seemingly uniform

darkness or focusing on near-empty distances - the device generated layered pixel abstractions, swirling textures, or emergent shapes produced through algorithmic attempts to identify edges, objects, or spatial depth where none existed.

These visual outcomes are analyzed in dialogue with literature from media theory, optical physiology, and machine learning. The work draws parallels between machine-generated artifacts and historical accounts of subjective human visual phenomena - such as phosphenes, retinal afterimages, or the “visual snow” that emerges in human perception under low-light conditions. Jan Evangelista Purkyně’s descriptions of interior visual sensations offer a historical counterpoint, proposing an early understanding of how the eye produces images in the absence of external stimuli. By comparing Purkyně’s subjective visual “fantom” with the smartphone’s algorithmically produced artifacts, the research project suggests a new way of reading machine vision: not as an objective capture of the world, but as a field where internal processes manifest visually in response to perceptual deprivation.

The project also situates smartphone photography within the broader discourse of computational imaging and predictive rendering. Today’s phones routinely generate composited or partially synthetic images through multi-frame fusion, AI-based enhancement, edge reconstruction, and object recognition. These systems do not merely record light; they infer, interpolate, compress, and beautify according to embedded models of what constitutes a “good” image. In cases such as Samsung’s “Space Zoom” moon photographs - where neural networks insert pre-learned lunar textures even when the sensor receives no such detail - the apparatus acts not as a documentarian but as an imaginative agent filling the output with generative assumptions.

Darkness accentuates this condition. When an image lacks a stable referent, the camera’s computational systems might become hyperactive, revealing the apparatus as an interpretive force rather than a passive recorder. The photographic results thus serve as documents of the camera’s internal operations: traces of training data, visual preferences encoded in algorithms, filtering decisions, and speculative reconstructions of missing information. These artifacts reflect a kind of machine apophenia - the tendency to perceive patterns in noise - not unlike human perceptual biases but rooted in very different architectures and datasets.

Ultimately, the project argues that the smartphone camera performs a form of autonomous machine vision, evident precisely where its capacity to depict external reality breaks down. By forcing the apparatus into these conditions, the work makes visible the invisible layers of computation - thresholding, quantising, compressing, and filtering - that otherwise remain masked by seamless, hyper-optimized photographic outputs. The images produced in these conditions are not failures but revelations: outputs into which the device inserts traces of its own perceptual machinery.

Through this investigation, the project contributes to discussions on the aesthetics of computational photography, the epistemology of machine vision, and the shifting role of the photographic apparatus in contemporary visual culture. It suggests that darkness, rather than being an obstacle, is a tool for probing the hidden “subjectivities” of imaging systems -

subjectivities that increasingly mediate how human users see, remember, and make sense of the world through everyday technologies.

This contribution aligns primarily with the subtheme ***Resolution regimes***.

Keywords: Blackbox, Machine vision, Noise, Algorithmic interpretation, Darkness