

A noise-free moon: Noise-cancelling technologies for smartphone cameras

In photography, noise is generally intended as an unwanted visual element and is often a source of concern, dissatisfaction and annoyance. To overcome such disturbances, noise-cancelling techniques have been introduced into photo cameras first and smartphone photo cameras later. These techniques, initially, were mainly employed to reduce noise arising from technical constraints and limitations. However, thanks to increased computing capabilities and progress in the field of machine vision, in the late 90s, such techniques started to be employed for a wider array of more complicated operations. For instance, the automatic elimination of the red-eye effect—the appearance of red pupils due to the use of a flashlight commonly seen in many photographs till the mid-2000s, and other denoising purposes to enhance the quality of an image.

The last wave of AI capabilities for smartphone cameras in the second half of the 2010s, thanks particularly to new machine learning techniques, has once again expanded the applications of such technologies. A case in point is the recent *Samsung Space Zoom case*. The Samsung S23 Ultra smartphone's 100' 'Space Zoom' feature allows the user to shoot detailed photographs of the Moon. In its 2023 video advertisement prior to the smartphone's release, it is possible to see a highly detailed and sharp image of the Moon captured by the smartphone, followed by the phrase 'epic nights are coming' (Samsung 2023). However, a Reddit post showed how such images of the Moon appear to be more the result of a series of complex, sophisticated and *opaque* operations rather than a result of the smartphone's powerful new zoom capabilities. A Reddit user, *ibreakphotos*, devised an ingenious yet simple test to demonstrate that the S23 Ultra *adds* unrealistic details to photographs to 'ameliorate' them. The smartphone, according to *ibreakphotos*, did not just restore lost or noisy data; it had created 'a new Moon—a fake one' (Vincent and Porter 2023: n.pag.).

The increasing attention to photography, together with the emergence of new AI possibilities, has marked a profound shift in the use of these technologies. Yet, despite their presence on nearly every commercial smartphone and the new concerns, doubts and issues that this noise-free type of photographic image raises, noise-cancelling technologies remain largely unexplored in photography and visual cultural studies. Through a case study—i.e., the Samsung Space Zoom case—this paper provides **a)** an overview of noise-cancelling technologies, **b)** investigates their functioning and **c)** their role in redefining the contemporary photographic model, particularly in the context of smartphone photography.

Keywords

Noise-cancelling technologies; Visual noise; Smartphone photography; Samsung Space Zoom.

References

ibreakphotos (2023), 'Samsung "space zoom" moon shots are fake, and here is the proof', Reddit, March, https://www.reddit.com/r/Android/comments/11nzb0/samsung_space_zoom_moon_shots_are_fake_and_here/. Accessed 20 December 2023.

- Samsung (2023), 'Samsung Galaxy Unpacked: Epic nights are coming', YouTube, January, https://www.youtube.com/watch?v=1BPLGjjF0rc&ab_channel=Samsung. Accessed 25 April 2023.
- Steyerl, Hito (2014), 'Proxy Politics: Signal and Noise', *e-flux Journal*, issue 60, 1-14, <https://www.e-flux.com/journal/60/61045/proxy-politics-signal-and-noise/>. Accessed 20 April 2023.
- Vincent, James and Porter, Jon (2023), 'Samsung caught faking zoom photos of the Moon', The Verge, 13 March, <https://www.theverge.com/2023/3/13/23637401/samsung-fake-moon-photos-ai-galaxy-s21-s23-ultra>. Accessed 19 December 2023.

Biography

Carloalberto Treccani is an artist and a Research Assistant Professor at the Hong Kong Baptist University in the Department of Humanities and Creative Writing. His work explores the development and implications of visually 'intelligent' machines. His scholarly work has been published in several academic journals, including *Leonardo* (MIT Press), the *European Journal of Media Studies* (Amsterdam University Press) and *AI & Society* (Springer). He is currently working on a book titled *Vision, Visual Perception and Visuality in the Ages of 'Intelligent' Machines*.