

New algorithm repairs corrupted digital images in one step

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From phone camera snapshots [1] to lifesaving medical scans, digital images play an important role in the way humans communicate information. But digital images are subject to a range of imperfections such as blurriness, grainy noise, missing pixels and color corruption.

A group has designed a new algorithm that incorporates artificial neural networks to simultaneously apply a wide range of fixes to corrupted digital images. The research team tested their algorithm by taking high-quality, uncorrupted images, purposely introducing severe degradations, then using the algorithm to repair the damage (see Fig.1).



Figure 1: The research team artificially degraded a stock image, deliberately introducing blur, noise and other imperfections. BOTTOM: The research team’s new image repair algorithm automatically returned the image to near-original quality.

Artificial neural networks [2] are a type of artificial intelligence algorithm inspired by the structure of the human brain. They can assemble patterns of behavior based on input data, in a process

that resembles the way a human brain learns new information. And the team has designed a new algorithm that incorporates artificial neural networks to simultaneously apply a wide range of fixes to corrupted digital images. The researchers tested their algorithm by taking high-quality, uncorrupted images, purposely introducing severe degradations, then using the algorithm to repair the damage.

References

- [1] T. Schwaebel *et al.*, “Photoscopy: spectroscopic information from camera snapshots?,” *Chemical Science*, vol. 5, no. 4, pp. 1422–1428, 2014.
- [2] K. Downing, “Evolving artificial neural networks,” pp. 1423–1447, 1999.