

Reality in the eye of the beholder: A Photoshop reality check

28 November 2011



Actress Kim Cattrall in an image before digital retouching. Credit: PNAS

You know they couldn't possibly look that good. But what did those models and celebrities look like before all the retouching? How different is the image we see from the original?

Dartmouth Computer Science Professor Hany Farid and Eric Kee, a PhD student at Dartmouth College, are proposing a method to not only answer such questions but also to quantify the changes.

As Farid writes, "Impossibly thin, tall, and wrinkle- and blemish-free models are routinely splashed onto billboards, advertisements, and magazine covers." He says that this is "creating a fantasy of sorts." Going beyond considerations of aesthetics or any dishonesty of photo editors or advertisers, Farid and Kee voice public health concerns.

In a paper published in the [Proceedings of the National Academy of Sciences](#) (PNAS) on November 28, 2011, they point out that these

highly idealized images have been linked to eating disorders and body image dissatisfaction in men, women, and children. The authors note that the American Medical Association has recently adopted a policy to "discourage the altering of photographs in a manner that could promote unrealistic expectations of appropriate body image."



Image of actress Kim Cattrall after digital retouching. Credit: PNAS

There have already been repercussions in the United Kingdom. A Reuters news story from July 2011 reports: "Two L'Oreal cosmetics adverts [advertisements] featuring actress Julia Roberts and supermodel Christy Turlington were banned in Britain by the Advertising Standards Agency, following complaints by MP [Member of Parliament] Jo Swinson. Liberal Democrat MP Swinson said the magazine adverts for foundations made by Maybelline and Lancome, both owned by L'Oreal, were misleading because the photos had been digitally altered." On a prior occasion, L'Oreal had been forced to add a disclaimer to another ad.

But Farid and Kee assert that outright bans or simple disclaimers may not be addressing the issue fairly or completely. They are seeking a way to for advertisers to truthfully and accurately characterize the extent to which an image has been altered while allowing the public to make informed judgments. The goal is to create a metric that provides an objective assessment of how much alteration has been made.

The authors propose a rating system that takes into account common practices such as cropping and color adjustment while providing assessment of other kinds of modifications that dramatically change a person's appearance. They consider geometric alterations such as slimming legs, adjusting facial symmetry, and correcting posture, as well as photometric manipulations that might include removing wrinkles, "bags" under the eyes and skin blemishes.

"We start with the before and after digital images from which we automatically estimate the geometric and photometric changes, effectively reverse engineering the manipulations that a photo retoucher has made," Farid says.

In the study, to crosscheck and validate their metric, human observers were asked to compare and rank the differences in hundreds of pairs of before and after retouching images. The results correlated highly with the mathematical metric.

"Such a rating may provide incentive for publishers and models to reduce some of the more extreme forms of digital retouching that are common today," the authors conclude, but they add, "It remains to be seen if this rating can mediate the adverse effects of being inundated with unrealistic body images."

Provided by Dartmouth College

APA citation: Reality in the eye of the beholder: A Photoshop reality check (2011, November 28) retrieved 24 October 2020 from <https://phys.org/news/2011-11-reality-eye-photoshop.html>

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