

# AI technique captures complexity of human faces to help create realistic photo edits

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Lehtinen and colleagues' work has helped power Adobe Photoshop's new Smart Portrait Tool. Thanks to close collaboration with Adobe, the technique moved from academic publication to the hands of users in just a couple years. Photo: Mikko Raskinen

A half-century ago, we expected the future to hold sophisticated computers and robot helpers to slash the time we spend on work and household chores.

Yet, while we now have nearly unlimited knowledge at our fingertips, the level of automation that some predicted still hasn't come to be. What

happened?

It turns out that things are a little more complicated than we expected.

"It's taken us a surprisingly long time to come to terms with how complex the world is," says Jaakko Lehtinen, an associate professor of [computer](#) science at Aalto University and distinguished research scientist at [computer graphics](#) firm NVIDIA.

## Unsupervised learning

Lehtinen's work focuses on Artificial Intelligence techniques that create new, realistic images, simply by looking at examples. The method has not just helped speed up tasks, which in the past could take a skilled professional days or weeks, to a matter of seconds but eliminated the need for [human eyes](#) all together.

"Doing this without human supervision is a building block of intelligence," Lehtinen explains. "Looking at a large collection of images, the algorithm distills the essence of what it sees into a recipe, which it uses to create new images that show the same, hard-to-pinpoint laws and rules."

With colleagues at NVIDIA, the techniques have, for example, created pictures of non-existent faces that look so eerily real, you could swear they were in the last movie you saw. Most recently, they have made their way into New Portrait tool in Adobe Photoshop, which users around the world can use to easily change the gaze, smile or even age of real faces.

These are impressive achievements, but it's easy to overlook the potential of this technology if we concentrate on image creation or manipulation. Lehtinen says that methods that learn to imagine what's out there will be crucial to computer vision and robotics going forward.

"To deal with a completely new environment, like your home or office, and all of the real-world scenarios that may occur there, a robot needs a really robust idea of what all kinds of different homes and offices look like. These techniques could finally help them deal with all that complexity."

Provided by Aalto University

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