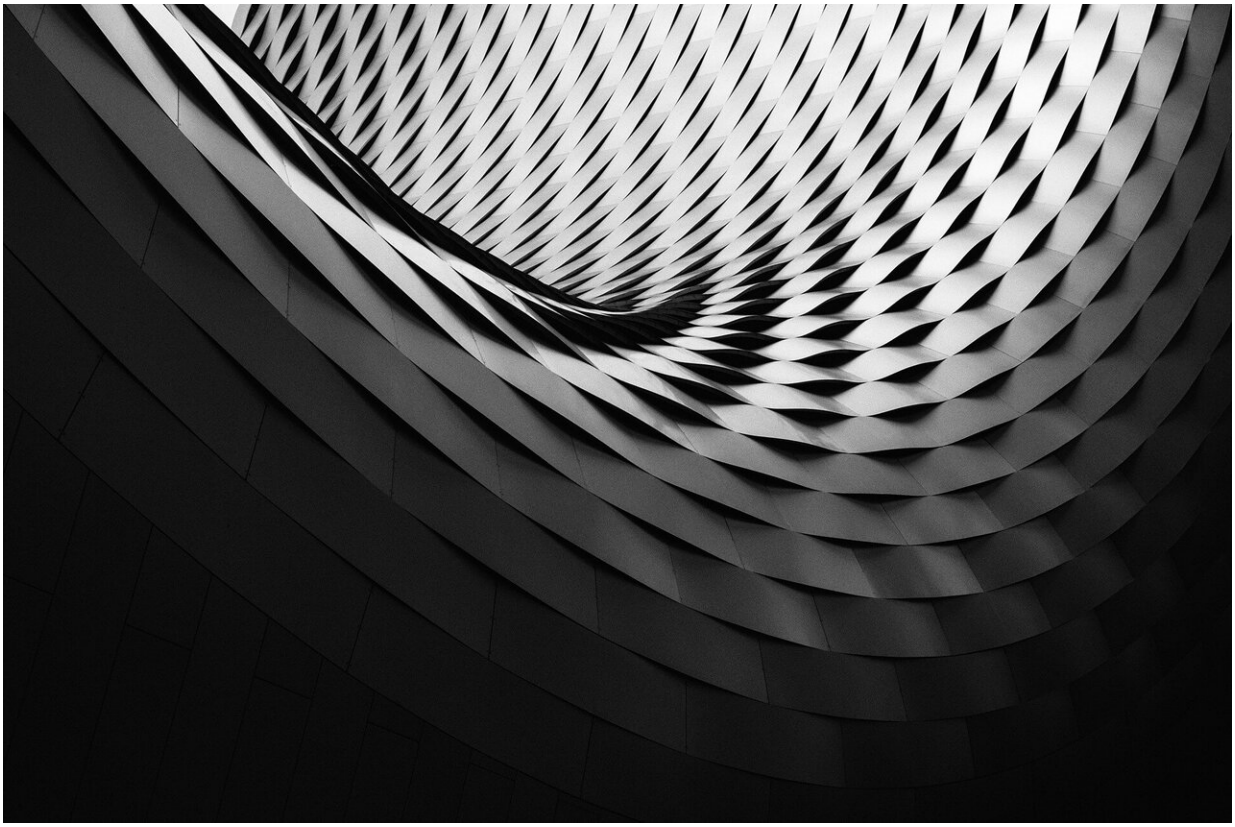
Attacking the clones: Dual techniques help reveal malicious image editing

January 31 2020, by David Bradley



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It is relatively easy to clone parts of an image with photo editing software to remove objects and backgrounds or even to duplicate objects. A skillful digital artist will be able to do this almost seamlessly.

Such artists with malicious intent can use cloning tools and to fake and forge images and detecting such distortions of the originals can be difficult even to those trained in the art themselves.

Now, work published in the *International Journal of Forensic Software Engineering* shows how two distinct analytical techniques—ad hoc method and principal component analysis (PCA) based scale-invariant feature transform (SIFT) method—can work together in a hybrid system to analyze an image and reveal where such cloning techniques have been used for illicit purposes. Ashish Kumar Chakraverti of IKG-Punjab Technical University, in Jalandhar, and Vijay Dhir of the M.K. Group of Institutes, in Amritsar, Punjab, India, provide details in the latest issue of the journal.

The approach involves a preprocessing step in which the image of interest is adjusted in terms of contrast and color and other factors to create a version of the image that can be analyzed more readily. The hybrid analytical technique then works its way through the image to reveal errant regions of the image. The team has tested its hybrid approach successfully on the CoMoFoD image database. They had fewer false positives and negatives than state-of-art detection programs, which bodes well for its application in defeating criminality involving such image manipulation.

More information: Ashish Kumar Chakraverti et al. A hybrid approach to find cloned objects in copy move forged images, *International Journal of Forensic Software Engineering* (2020). DOI: 10.1504/IJFSE.2019.104705

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