

Adding another dimension to thermography

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Most of thermographic imaging devices produce a two-dimensional (2D) image of the captured radiation. However, there are situations where the thermographic 2D image is not the best form of presentation (e.g., to locate an abnormally low- or high-temperature pipe buried in a large, open “nest” of pipes). If the thermographic 2D image could be converted to a three-dimensional (3D) image, then abnormal-temperature objects can be located more easily with an innate feature of human sight (i.e. depth perception using binocular vision).

3D images with restrictions (e.g., “frozen” images) can be generated from two 2D images taken with a normal (2D) camera (or a 2D thermographic imaging device) from two positions a controlled distance apart and pointed in the same directions (the so-called “cha-cha” technique).

The author will give a demonstration of generating 3D thermographic images using pairs of 2D thermographic images produced using a FLIR ONE 2D infrared imaging device attached to an Apple iPhone 5S and a “freeware” software package (Stereo Photo Maker (SPM)) to image process the pair of images and provide a range of facilities. SPM removes distortions, auto-aligns and synchronously “crops” the two images, and provides a wide range of display formats suitable for a variety of 3D display devices (e.g., 3DTVs, red-and-cyan-filtered anaglyph glasses with 2D color screens, and 3D-capable digital projectors).

Keywords

2D thermal image, 3D thermal image, anomaly location, image processing