

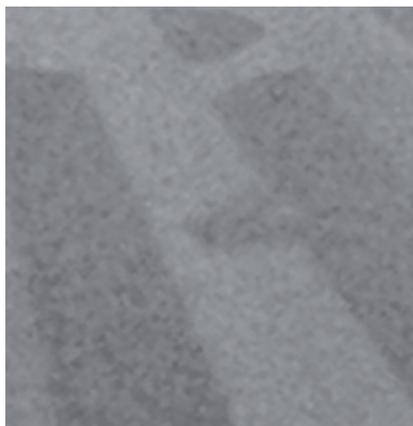
SRVIEWER

Super-resolution software
for enhanced infrared videos

Infrared imaging has become an invaluable resource for both military and security applications, since it provides day/night detection and identification of both people and objects. Digital processing is now an essential part of any IR imaging system, since it improves image resolution and contrast, with very cost-effective performance. To meet this demand, ONERA is introducing SRViewer, an interactive platform that enhances IR images with unrivaled performance.

ONERA

THE FRENCH AEROSPACE LAB



The original image (top). After SR processing, we can clearly see the presence of a tank in this scene (bottom)

SRViewer at a glance

SRViewer is an infrared video display system, incorporating digital processing for super-resolution (SR) in real time. It combines several consecutive images in a video to produce an image offering better resolution, better contrast and less noise.

In other words, SR uses the natural redundancy in a video: because of the camera's movements during image acquisition, even infinitesimal, a given object is recorded several times from slightly different viewpoints. By combining these viewpoints, we can produce an enhanced image, showing finer details than on the original images.

This super-resolution effect is clearly visible in contrasted details, such as text zones (license plates, posters, etc.). It enables operators to more easily distinguish fine structures, and thus improve their ability to interpret scenes, while also enhancing working comfort.

Applications

SRViewer is intended for video interpreting stations, especially those used to process IR images for a number of applications, including:

- interpretation of aerial videos, for example those shot by observation drones;
- zone surveillance, for example in border control operations.

Portable versions of SRViewer could also be developed, for use in conjunction with IR binoculars, or the IR sensor in a microdrone.

Advantages

- Processing speed: the software uses powerful graphical processing units (GPU), which can handle a 384x256 sequence at video speed and offer the viewing comfort and detailed information of a high-resolution video.
- Extended operability: it offers clear advantages on video sequences of objects that are moving or could be distorted (people, vehicles), thanks to the use of eFOLKI, a fast optical flow estimation method developed by ONERA.
- Easy to use: operators can easily adjust different settings, including zoom, noise correction factor, contrast, etc. Any resulting changes on the SR video are shown in real time.