Generation of a Combined Dataset of Simulated Radar and EO/IR Imagery

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Abstract:
In the world of remote sensing, both radar and EO/IR (electro-optical/infrared) sensors carry with them unique information useful to the imaging community. Radar has the capability of imaging through all types of weather, day or night. EO/IR produces radiance maps and frequently images at much finer resolution than radar. While each of these systems is valuable to imaging, there exists unknown territory in the imaging community as to the value added in combining the best of both these worlds. This work will begin to explore the challenges in simulating a scene in both a radar tool called Xpatch and an EO/IR tool called DIRSIG (Digital Imaging and Remote Sensing Image Generation). The capabilities and limitations inherent to both radar and EO/IR are
similar in the image simulation tools, so the work done in a simulated environment will carry over to the real-world environment as well. The goal of this effort is to demonstrate an environment where EO/IR and radar images of common scenes can be simulated. Once demonstrated, this environment would be used to facilitate trade studies of various multi-sensor instrument design and exploitation algorithm concepts. The synthetic data generated will be compared to existing measured data to demonstrate the validity of the experiment.

**Bio:**

Lieutenant Nancy Baccheschi received a Bachelor’s degree in Mechanical/Aerospace Engineering from Worcester Polytechnic Institute and is currently finishing her Master’s degree in Imaging Science at Rochester Institute of Technology. Previously, she worked as an Aerospace Engineer in the Electronic Systems Center in Massachusetts for the United States Air Force.

**Keywords:**
Synthetic aperture radar (SAR), electro-optical/infrared (EO/IR), synthetic imagery, DIRSIG, Xpatch