Synthetic SAR Image Generation using Sensor, Terrain and Target Models

A tool to generate synthetic SAR images of objects set on a clutter background is described. The purpose is to generate images for training Automatic Target Recognition and Identification algorithms. The tool employs a commercial electromagnetic simulation program to calculate radar cross sections of the object using a CAD-model. The raw measurements are input to a SAR system and terrain model, which models thermal noise, terrain clutter, and SAR focusing to produce synthetic SAR images. Examples of SAR images at 0.3m and 0.1m resolution, and a comparison with real SAR imagery from the MSTAR dataset is presented.

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