Software for Simulating Remote Sensing Systems

The Application Research Toolbox (ART) is a collection of computer programs that implement algorithms and mathematical models for simulating remote sensing systems. The ART is intended to be especially useful for performing design-tradeoff studies and statistical analyses to support the rational development of design requirements for multispectral imaging systems. Among other things, the ART affords a capability to synthesize coarser-spatial-resolution image-data sets from finer-spatial-resolution data sets and multispectral-image-data products from hyperspectral-image-data products. The ART also provides for synthesis of image-degradation effects, including point-spread functions, misregistration of spectral images, and noise. The ART can utilize real or synthetic data sets, along with sensor specifications, to create simulated data sets. In one example of a typical application, simulated data pertaining to an existing multispectral sensor system are used to verify the data collected by the system in operation. In the case of a proposed sensor system, the simulated data can be used to conduct trade studies and statistical analyses to ensure that the sensor system will satisfy the requirements of potential scientific, academic, and commercial user communities.

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