

# EVE: On-Board Process Planning and Execution

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## Abstract

The Information Technology and Systems Center (ITSC) at The University of Alabama in Huntsville is developing an innovative processing framework aimed at assisting science users in the use of the unique constraints and characteristics of the on-board satellite data and information environment. The Environment for On-Board Processing (EVE) system serves as a proof-of-concept of advanced information systems technology for remote sensing platforms. With EVE, data is processed as it is collected, enabling the production of custom data products on-board and in real-time. The web-based drag-and-drop EVE editor allows science users to build processing plans, which are compatible with the constraints of on-board computing environments. The EVE on-board, real-time processing infrastructure, will upload, schedule, and control the execution of these plans. Operations within the plans provide capabilities focused on the areas of autonomous data mining, classification and feature extraction using both streaming and buffered data sources. These will contribute to science research applications, including natural hazard detection and prediction, fusion of multi-sensor measurements, intelligent sensor control, and the generation of customized data products for direct distribution to users. A ground-based testbed has been created to provide testing of EVE and associated science applications in a heterogeneous, embedded hardware and software environment. Testbed components include platforms that represent both space based and ground based sensor platforms, including wireless sensor mesh architectures.