ENVI & IDL Services Engine: Earth and Planetary Image Processing for the Cloud

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Introduction

ENVI is an advanced image analysis software package that allows users to extract information from remotely sensed data (e.g., optical, thermal, radar, LiDAR, and two-dimensional array data). See Figure 1.

- ENVI is written in the IDL programming language, which allows remote sensing tasks to be automated or custom algorithms and workflows implemented. See Figure 2.
- IDL has been used by the earth and planetary science community for 35 years for scientific data visualization and analysis. It can be used as a standard programming language or to enhance ENVI’s capabilities.
- ENVI and IDL are compatible with hundreds of different data types including scientific formats like NetCDF and HDF5. Both applications contain a wide range of analysis functions ranging from data preprocessing, calibration, math and statistical functions, and spectral and feature-based analysis tools, etc.
- The ENVI and IDL Services Engine deploys data access, analysis, and visualization capabilities to an enterprise level. The Engine is deployable in a cloud computing environment and leverages a number of external services to allow for middleware interoperability (e.g., ArcGIS Server or GeoServer) with any enterprise IT infrastructure.
- The ENVI and IDL Services Engine represents bringing long term earth science monitoring and analysis capabilities to the cloud, harnessing existing ENVI and IDL tools, deploying them to the enterprise, and improving access to earth and planetary science data.

Background

- The geospatial imagery analysis community has a growing need for online analytic applications from a web or mobile client interface. The working name for this capability is the ENVI and IDL Services Engine.
- Work previously done on desktop workstations must migrate to a web or mobile client interface. The ENVI and IDL Services Engine represents bringing long term earth science monitoring and analysis capabilities to the cloud, harnessing existing ENVI and IDL tools, deploying them to the enterprise, and improving access to earth and planetary science data.
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A Reference Implementation

- In an effort to provide examples of how the ENVI and IDL Services Engine can be used, Exelis VIS created a reference implementation that metaplates several pieces of existing ENVI code and IDL. This implementation:
  - Includes an animation, a profile of vegetation change over time, or specific points correlated to ground truth measurements. These results could be delivered to web, mobile or desktop clients.
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Summary

- The way imagery data is being stored and analyzed is changing. ENVI and IDL have long been tools used in Earth and Planetary science communities. The ENVI and IDL Services Engine helps scientists use transition to the cloud while still being able to use legacy code and algorithms.
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