

ENVI® DEEP LEARNING MODULE

Deep learning – faster, easier and generates results you can trust

NV5 Geospatial has developed commercial off-the-shelf deep learning technology that is specifically designed to work with remotely sensed imagery to solve geospatial problems. The ENVI Deep Learning module removes the barriers to performing deep learning with geospatial data and is currently being used to solve problems in agriculture, utilities, transportation, defense and other industries.

ACCURACY COUNTS

ENVI is the leading image analysis software on the market and its science-based analytics are accurate and reliable for extracting meaningful information from all types of geospatial imagery and data. ENVI's preprocessing tools such as calibration, atmospheric correction and color space transforms create consistent input data for deep learning models. With deep learning technology built on TensorFlow, a leading open source library, you can create reliable models for image classification.

NO PROGRAMMING REQUIRED

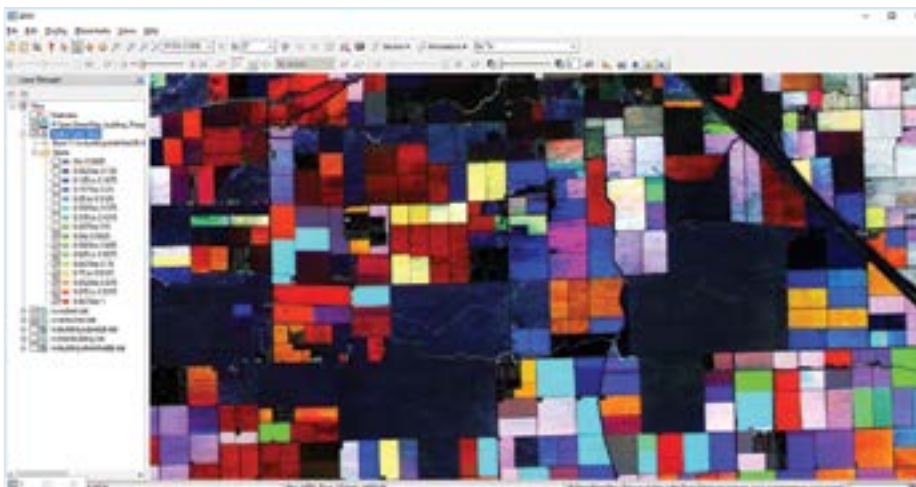
Not everyone is a deep learning expert and the ENVI Deep Learning module was developed with this in mind. The module has intuitive tools and workflows that don't require programming and enable users to easily label data and generate models with the click of a button.

Additionally, it is simple for seasoned imagery experts to fuse information layers such as spectral indices, elevation data or data transforms to create more robust classifiers.



BENEFITS

- > Easy to use – no programming required
- > Quickly create and retrain classifiers
- > Works with multi-modal geospatial data and imagery to solve problems across industries
- > Makes it easy to label data, extract features and iterate
- > Easily add supplemental data layers to improve performance
- > Create classifiers once that can be shared and deployed to run at-scale
- > Seamless integration with ENVI for robust data preprocessing and more accurate results



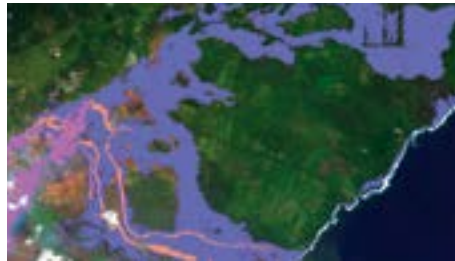
Using ENVI's proven analytics, additional data layers for deep learning can be created to accentuate features of interest. These data layers aid in the development of more robust and accurate classifiers by helping neural networks more easily learn where they need to focus.

ENVI DEEP LEARNING MODULE AT WORK

The ENVI Deep Learning module is offered as an extension to ENVI for desktop applications and is built on the ENVI Task framework. This means that classifiers can be built once and run in any environment, whether that's your desktop computer, on-premises servers or in the cloud. To demonstrate how you can use this technology, here are a few real-world examples of customer problems that have been solved using the module.

URBAN GROWTH

The ENVI Deep Learning module makes it easy to assess the environment. The module was used to generate the landcover classification image below. When another image was generated the following year, traditional change detection workflows in ENVI were used to approximate the human impact on the environment and detect things like new buildings and well pads.

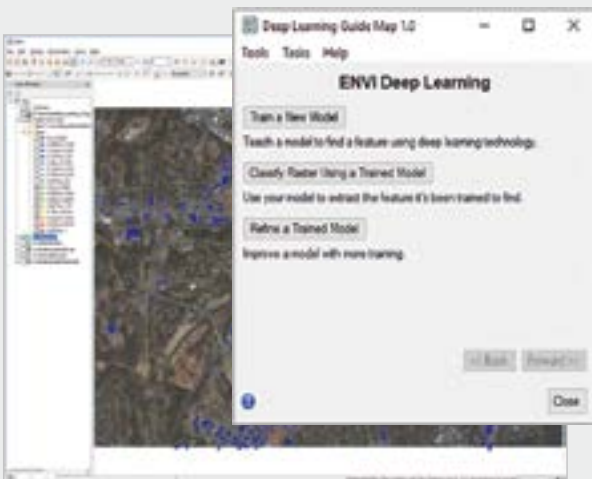


AGRICULTURE

Using the ENVI Deep Learning module, the locations of current, and past, lava flows in Hawaii were identified. This information was used in ENVI to understand the environmental impact that the volcanic gasses had on local crops, which gave farmers insights for insurance claims and an ability to understand if crops are safe for human consumption.

DISASTER RESPONSE

When disasters strike, response time is very important. The ENVI Deep Learning module has been tuned so you don't need thousands of samples to create models for finding features. After a recent hurricane, the module was used to quickly characterize different types of damage to buildings throughout the region ranging from partial to full destruction. First, a handful of small areas were labeled according to the extent of the damage. When the model was applied to the scene, the damaged buildings were automatically classified according to the extent of the damage they sustained.



The ENVI Deep Learning module has all the tools you need to create robust classifiers. For those that want help, our in-house staff of deep learning experts can create custom models to meet your needs.

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