radiant SOLUTIONS
A MAXAR COMPANY

DATA SHEET

MACHINE LEARNING

Machine Learning

Speed and scale matter when it comes to driving results and accelerating mission impact. But the vast amount of geospatial data generated by today's growing number of sensor platforms creates challenges in taking advantage of this data in a timely manner. Radiant Solutions harnesses advancements in Machine Learning (ML) by applying computer vision and pattern analysis technology to geospatial problems. From producing labeled training datasets, to developing, deploying and validating custom algorithms, Radiant Solutions delivers the technological and mission expertise needed to leverage machine learning to enable automation for game changing results.

Features & Benefits

Highest Quality Imagery Content

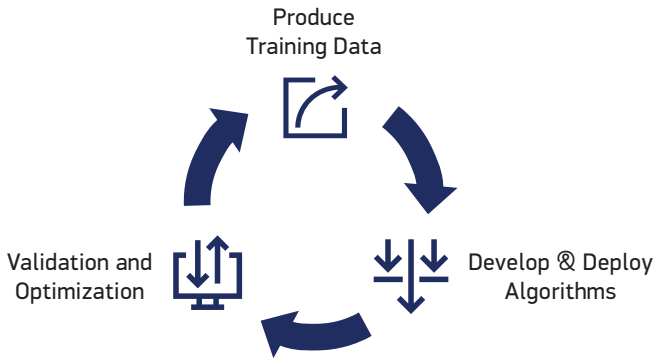
- Utilizes DigitalGlobe imagery with 30cm and 50cm resolution

Large, Diverse Training Datasets

- Expertise producing large 1+ million training datasets across a variety of objects types
- Labeling options from bounding boxes to fully segmented polygons such as building footprints, road network, and vehicles

ML Hardware and Software Expertise

- Experience with various ML frameworks and standards to take advantage of the latest hardware architectures and processors



LABELED TRAINING DATASET

CAR COUNTING ALGORITHM

Support open innovation for government, industry and academia

Open Datasets and Prize Challenges:

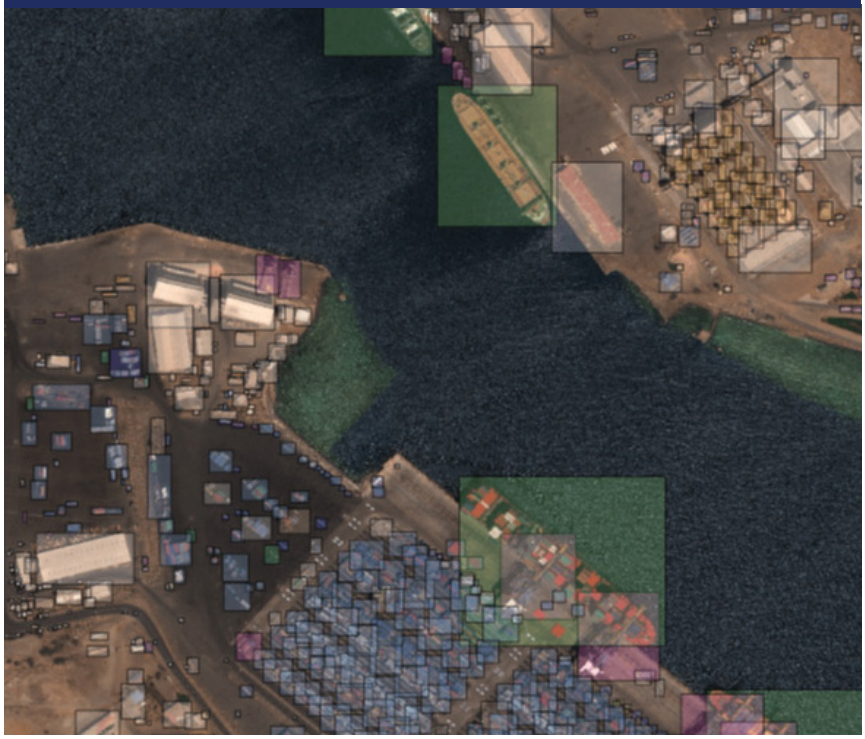
- **SpaceNet** - an online repository of freely available satellite imagery, co-registered map data to train algorithms, and a series of public challenges designed to accelerate innovation in machine learning using geospatial datas
- **IARPA Functional Map of the World (fMoW)** - fostering breakthroughs in the automated analysis of overhead imagery by harnessing the collective power of the global data science and machine learning communities
- **2018 NGA DIUx xView Detection Challenge** - a partnership between NGA and Defense Innovation Unit Experimental (DIUx) to launch the to spur innovation that will ultimately support national security and humanitarian missionsn

Tools:

- **DeepCore SDK** - an open source deep learning software development kit that allows users to build their own applications using popular deep learning frameworks

Delivery: Onsite Enterprise and Cloud Solution

ANNOTATED IMAGE FROM XVIEW DATASET



A fully annotated image from xView. Classes are denoted by different bounding box shadings. All imagery in this figure is from DigitalGlobe.

Want to put Radiant Solutions' ML expertise to work for you? Contact machinelearning@radiantsolutions.com

Solutions

1. Produce Geospatial Labeled Training Data

- Identify opportunities for automation and plan training data production by working with customer
- Provide insight into how the unique characteristics of overhead imagery and other geospatial data can be harness for improved ML performance
- Utilize innovative mapping tools and vetted crowdsourcing to produce "ground truth" datasets for training using DigitalGlobe satellite imagery and map features

2. Develop and Deploy Algorithms

- Develop and train algorithms using the latest Deep Learning techniques utilizing GPUs for optimal performance
- Deploy computer vision applications to analyze overhead imagery, ground photos and video for feature extraction and change detection
- Perform geospatial pattern analysis which learn hidden relationships in data

3. Validation and Optimization

- Validate and optimized algorithms to take advantage of the latest hardware
- Validate outputs via analysts and supervised crowdsourcing techniques
- Improve production models iteratively using validated training data

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