OSSIM Overview
UNCLASSIFIED

Open Technology Division (OTD)

• Open Source Software
• Open Standards
• Professional Services for Integrated Solutions
• OTD Policy for US Government
• MIL-OSS conferences mil-oss.org
• US Government Sponsorship
• Classified Analysis
• CELTIC Pathfinder evaluation
• DoD Open Technology Development
• Large Data JCTD
• Operational Support
Open Source Business Model

- Projects fund Professional Services for support
- Inter project/agency collaboration by default
- No License fees for distribution
- Leverage from open standards and projects
- Open Source provides the best technical evolution path
What is OSSIM?

- Advanced Open Source C++ Remote Sensing and Geo-spatial processing
- Started in 1998 hosted on remotesensing.org and ossim.org
- Used in numerous commercial and government solutions
- Cross Platform – Linux, Windows, Mac
- One of the founding projects for the Open Source Geo-spatial Foundation osgeo.org
Design Criteria

- Photogrammetric Accuracy
- Non-Destructive, Parameter based image chain processing
- Radiometric preservation through the chain
- Automatic terrain correction, projection transformation, view synchronization
- External Plugin support
OSSIM Reviews

- Used in the Intelligence and Defense Communities
- NGA Certified Map Projections and Transformations
- RPC Universal Sensor Model validated
- Validated in NGA CELTIC Pathfinder 2003
- Classified Plugins and Services
- RDEC IC Evaluation 2008
- OSGeo Incubation Graduation 2009
Commercial

- RadiantBlue Technologies
- ImageLinks
- SPADAC
- Intelligence Data Systems
- L3 Corporation
- Titan Corporation
- Observera
- SAIC
- ITT
- Hewlett Packard

Government

- National Reconnaissance Office
- Naval Research Laboratory
- National Geospatial-Intelligence Agency
- Army Topographic Engineering Center
- SPAWAR
- Department of Defense
- US Geological Survey
- Naval Expeditionary Forces
- British Ministry of Defence
- Other
- NRO/NGA ILabs
- NASA
- DoD Large Data JCTD - ossimPlanet, OMAR
- Earthware (SPADAC)
- IED Detection (Observera)
- NASIC Comet/Optics (Ball Aerospace)
- NASIC (SAIC)
- Visibility Masks (L3-Communications)
- QinteQ
- Katrina Response (katrina.telascience.org)
- Satellite Ground Stations
- SPAWAR - Raven
- Aegis - Modeling and Simulation
- European Space Agency
- HP/EDS AMPA Program (British MOD)
- Telascience
Open Source Leverage

- Software Libraries
- Tools
- Systems
- Relational Databases
- Visualization
• Dynamically Connectable Image Chains
• Source > Models > Filters > Combiners > Output
• Parameter Based, Non-Destructive Processing
OSSIM Libraries

- Supports External Plugins
- Dynamically Loaded at Runtime
- Simple keyword based interface
• Similar to Google Earth and NASA World Wind, except..
• Open Source Software runs on multiple platforms
• Photogrammetric Accuracy
• Native file access, does not require precooked layers
• OGC WMS compliance for Distributed access
• Built on OSSIM Library (Open Source)
• Dynamically Connectable Objects and Functions
• Provides Rapid Prototyping of Custom Geo-Spatial Image Chains
Open Image Executed
Blend Menu

RadiantBlue Technologies, Inc.
Blend Layer Selection

The image shows a software interface with a window titled "Choose Layers to Blend." The window contains two image files, each labeled with a file path indicating they are from "Volumes/data_drive/data/san_francisco." The images appear to be satellite or aerial photographs, possibly for geospatial analysis or mapping. The interface has buttons for the actions 'Apply' and 'Cancel' and options for file operations like 'Open' and 'Print.'
New Chain Menu
Layer Manager Menu

Manager
Import image file...
Open image
- Histogram match
- Combine
- Fusion
- Correction
- Elevation

RadiantBlue Technologies, Inc.
Layer Manager Dragging
Layer Manager Dropping

RadiantBlue Technologies, Inc.
RadiantBlue Technologies, Inc.
Displays at Different Points in Chain

RadiantBlue Technologies, Inc.
Elevation Normals Calculation Selection
Elevation Normals Applied
Elevation Hillshade Layer Selection
Elevation Hillside Executed
Elevation Hillshade Edit Layers Executed

Available:
36: /Volumes/data_drive/data/ele
45: /Volumes/data_drive/data/ele
73: ossimBumpShadeTileSource

Inputs:
51: ossimOrthoImageMosaic
13: Image chain: /Volumes/data_d

Elevation angle: 45.000000000000000
Azimuth angle: 45.000000000000000
Smoothness factor: 1.000000

Auto apply  Apply  Reset  Close
Elevation Hillshade Elevation, Azimuth and Smoothness
Elevation Hillshade Edit Layers Very Rough
• Web Browser
  – Searching and Viewing
• OGC Standards
  – WMS
  – WFS
• SOA Services
  – OSSIM Services
• RSS Feeds
OMAR Components

Web Protocols

OpenLayers
Map Widget

Grails
OMAR Logic

Postgres/PostGIS
Spatial / Relational DB

Apache
Tomcat
MapServer CGI

OSSIM Mapping
Services
(OMS)

OSSIM Processing Engine
Core Functions

High Performance IO

Elevation
Repository

RadiantBlue Technologies, Inc.
• Web based geospatial archiving, production and delivery
• Open Source Software, Open Standards
• Supports National Imagery and Video Formats
• Most commercial formats supported
• Provides online geospatial processing
Zooming
Typically Optical and Infrared bands

Land Classification

Environmental and Resource Management

Hyperspectral for material classification
SAR
Synthetic Aperture Radar

- All Weather, Day or Night
- Value added products with advanced signal processing

SAR Imagery of the Gulf Oil Spill

RadiantBlue Technologies, Inc.
Sub Meter Satellite
Detailed Aerial, Oblique systems
Ground based systems

Aerial Imagery of Haiti refugee camps

RadiantBlue Technologies, Inc.
Commercial Satellite

RadiantBlue Technologies, Inc.
Sub meter resolution
Optical and Near IR coverage
Resampling and Sharpening
Direct Aerial measurement
High resolution elevation surfaces
Change Detection Products

Change detection in Haiti with LIDAR
Oblique Cameras
Aerial
Ground Based
Rapid Model Genaeration

Precision Lighworks 3D Models with Pictometry Sensor

RadiantBlue Technologies, Inc.
High Resolution, Wide Area Systems
3D Virtual Environments
Active Sensors (LIDAR, SAR, Interferometry)
Persistent Surveillance
Ubiquitous Remote Sensing
Crowd Sourcing
Automated Ground Station Processing
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