CARDIO LOGIC INC.

Image Processing and Information Extraction

Introduction

Cardio Logic, Inc. (CLI) is a 12-year-old company located in Silicon Valley California and an independent software developer for DigitalGlobe. With the background in chip design, image processing and system integration, CLI provides software, hardware and technical services to customers for high-speed and real-time information extraction from overhead earth images.

Technology

CLI has expertise in camera modeling/calibration for GIS applications, automated software for image production and hardware acceleration of algorithms.

Products

CLI presently offers two satellite image processing products:

Mojave™ IOPS

It is an Image Orthorectification Production software that rectifies the perspective distortion of satellite imagery and supports terrain model management, Ground Control Points (GCPs) for better geolocation accuracy and automated batch processing for mass production of orthorectified images or mosaiced tiles in NITF or GeoTIFF format.
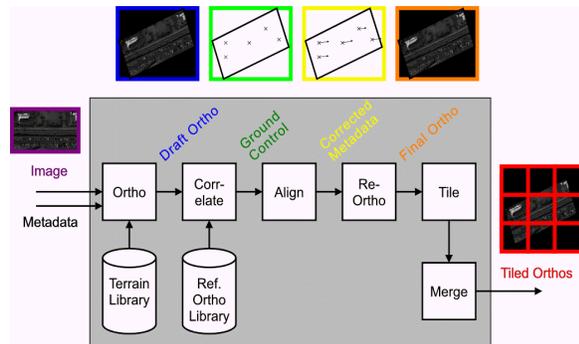
Completeness

Draft Ortho

High-speed GCP correlation is achieved by performing an initial or "draft" orthorectification of the input image based on the original metadata.

GCPs Alignment

The metadata are refined to align the GCPs geolocation on the draft orthos to those on the reference images for better geolocation accuracy.

Tiling and Merging

Orthorectified images are tiled to support the formats of GIS libraries, such as CIB. Partial tiles are merged into complete tiles, to create continuous wide area coverage without files of unwieldy size.

Automation

GCPs Collection

Mojave™ IOPS automatically collects Ground Control Points by correlating the images to a reference library like NGA's Control Image Base (CIB). The computer performs the pixel registration down to the sub-pixel level.

Input Image   Reference Ortho
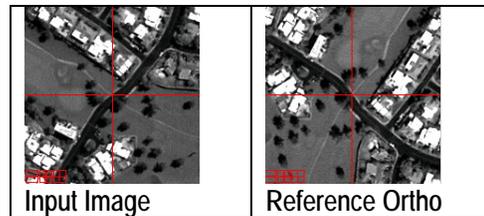
Library Management

Mojave™ IOPS automatically searches both terrain model and reference image libraries, retrieves and assembles the appropriate files for each image.

Quality

Accuracy

The GCP-aligned geolocation accuracy has been reviewed by DigitalGlobe and found to be comparable to their processes.

Resampling

Nearest neighbor, bilinear filtering, cubic convolution

Specifications

Sensors supported: QuickBird-2 imagery

File formats

Input imagery: NITF, TIFF
Output imagery: NITF, GeoTIFF
Projection: Geographic, UTM
Terrain models: DTED, SRTM
Reference Images: CIB

Image size: Up to 4 GB

Width x Height: Up to 64K x 64K pixels

Simplicity

User Friendly Interface
Mojave™ IOPS Graphical User Interface (GUI) features the ultimate in simplicity that allows operators to become productive with little training. All requisite parameter fields are assigned default values automatically.

Batch Processing
Mojave™ IOPS GUI allows operators to select multiple images for batch processing and specify multiple processing steps to be performed.
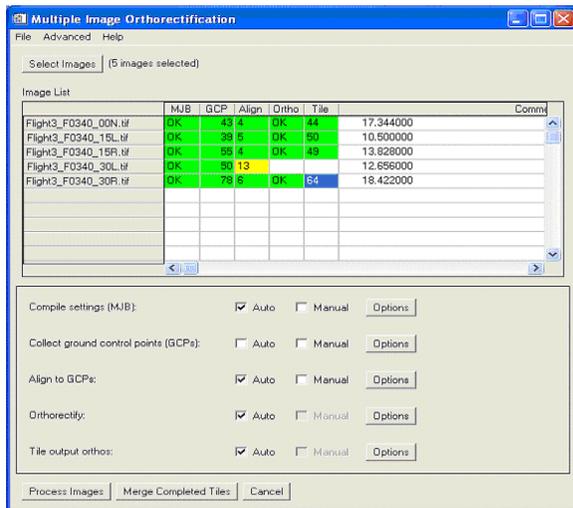
Status Report
Results are posted directly to the batch processing window, providing instant status monitoring and flagging of any faults with input imagery, metadata or support imagery. Corrective action can be initiated from the same screen.

Geo100M™ Workstation
It is a high-speed workstation with special hardware that accelerates the orthorectification processing of QuickBird imagery ten (10) times faster than the best commercially available software.

Configuration
OS: WINDOWS XP PRO SP2
CPU: Dual Core Xeon Proc 2.33GHz
RAM: 2GB, DDR2 SDRAM 667MHz
HDs: 500GB RAID 0 3.0Gb/s, 7200RPM
Video: Dual Monitor VGA and DVI Output
Engine: Magine2™ PCIe x8 Ortho Accelerator
Network: PCIe x4 slots for 10 Gigabit Ethernet

Speed
Geo100M™ orthorectifies images at 10 Mpixels per second. It will take 1.5 minutes, instead of 17 minutes by any software, to orthorectify a 1.6 GB (27552 x30564x16bits) single-band image at 0.70 meters Ground Sample Distance.
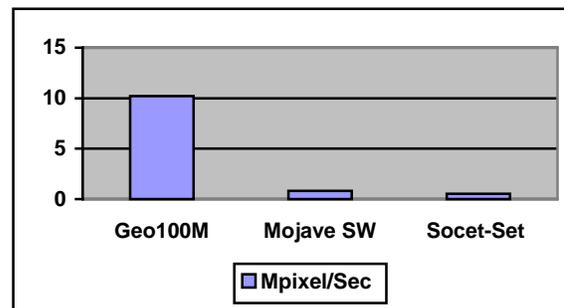
By adding the capability of automated image correlation and various processing utilities, Geo100M becomes an Image Orthorectification Production System (IOPS™) that enjoys dramatically cost and performance advantages over any other commercially available solutions.

Part Number
Mojave™ IOPS: IOPS-10-RPC-APP-WINNL
Geo100M™: G100-10-RPC

Cardio Logic, Inc
1200 Industrial Rd., Suite 7
San Carlos, CA 94070
650-622-9078
www.cardiofx.com
sales@cardiofx.com

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