Introduction to GeoImaging Accelerator Aerial (GXL – A)

Specifically designed to address geospatial industry needs for high levels of automation and production capacity, the GeoImaging Accelerator Aerial represents the latest evolution in image processing and analysis technology. GXL combines leading-edge hardware with complex software algorithms that result in a cost-effective image processing system that provides exponential improvements in speed and efficiency over traditional image-processing techniques. Improved data handling comes from the combination of powerful GPU-based hardware and distributed multi-threaded processing through optimized processors. From data ingestion, pan-sharpening, and orthorectification to tile generation, the accuracy and proficiency of automated workflows remain intact while ensuring desired output via customizable QA breakpoints.

GXL - A Value Proposition

Quite simply, the inclusion of GXL Aerial in a workflow will allow you to deploy your products into the market faster. GXL Aerial users can enjoy increased revenues with reduced expenditures. GXL Aerial enables customers to more with less in six key areas:

Speed: With GXL Aerial your production throughput will increase by up to 70X over conventional desktop orthorectification and mosaicing speeds.

Scalability/Modularity: GXL Aerial offers built in scalability. The GXL system can be deployed on readily available COTS hardware, making full use of processing speed available. Multi-Core and GPU-based processing nodes can be configured as needed. The GXL system will grow and expand, with your production requirements.

Automation: With automation in mind, all steps in a GXL workflow can be completely automated. Point the GXL system to your data, then sit back, and watch it complete end-to-end processing.

Quality: GXL allows manual inspection points to be added if necessary for you to inspect products at chosen processing breakpoints, allowing you to ensure you're getting optimum output quality.

Economy: Our GXL systems make use of readily available GPU processing power from nVIDIA GPUs as well as multi-core CPU hardware.

Results: The innovation of GXL Aerial lies not only in the speed and automation, but also in our technology's stunning color balancing and mosaic generation.

Technical Overview – GXL Aerial

GXL Aerial is available in Standard and Advanced versions. Both the GXL Aerial Standard and GXL Aerial Advanced solutions are high-performance computing platforms based on nVidia GPU technology and PCI Geomatics automated Orthorectification XL and Mosaic XL workflows.

A key benefit of GXL Aerial Standard is the ability to use desktop hardware to complete the solution. Thanks in large part to powerful nVidia GPUs and Intel® Core2™ Extreme Quad-Cors CPUs, GXL Aerial Standard maintaines a processing capability of 1000 UltraCam XP images per day.

For large-scale production, GXL Aerial Advanced leverages distributed rack-mount server technology, including networked storage and Gigabit Ethernet switching to increase processing to 2500 UltraCam XP images per day.

In either system, a central processing node keeps track of all resources on the GXL system, and allocates processing jobs based on resource availability. This way, all available processing capability is focused on completing the job as quickly as possible.

Individual software components can be joined to form workflows. These workflows have been designed from the ground up for GXL in order to take advantage of multiple CPUs and GPUs, to achieve significant gains in processing speeds.

Data Ingest
GXL automatically recognizes data from a variety of formats and sensors, applying the relevant data ingest routine automatically. Additional processing occurs at the Data Ingest step, including automatic Ground Control Point collection. This provides the necessary information for automated image corrections along the processing chain.

Orthorectification
Parallel processing and GPU-based performance provides significant speed improvements over conventional, single processing node systems to compute Rational Polynomial Functions and perform orthorectification in a fully automated manner, with or without Ground Control Points.

PanSharpening
PanSharpening fuses multi-spectral and panchromatic image data together, forming a high resolution multi-spectral dataset. GXL pansharpening routines yield extremely high quality output, providing stunning results.

Mosaic Preparation
This automated and GPU enhanced workflow collects information across all scenes in a project to determine optimal colour balancing, create cutlines, and determine preferred z-ordering, providing all necessary elements to create high quality mosaics.

Mosaic Creation
This workflow takes the input from Mosaic Preparation and creates the desired output mosaic(s), with options for single file or tiled output.

About PCI Geomatics

PCI Geomatics is the world leader in geo-imaging products and solutions, delivering modular image processing software, training, and support services to a worldwide client base.

Since its inception in 1982, PCI has been at the forefront of the geo-image processing software industry, developing desktop software for production workflows. In response to the increasing demand for high throughput and rigorous image correction requirements, the company has invested heavily in high speed computing, developing automated, modular, and high speed solutions. PCI Geomatics has set the standard in remote sensing and image processing tools offering customized solutions to the geomatics community in over 135 countries and with more than 21,000 licenses distributed worldwide.

PCI Geomatics' Relationship with Vexel Imaging

In March 0f 2010, PCI Geomatics began a partnership with Microsoft's Photogrammetry division, Vexcel Imaging GmbH. This alliance leverages the strengths of the two organizations to produce an end-to-end image processing system developed specifically for customers of Vexcel Imaging's UltraCam series of high-resolution digital aerial cameras and UltraMap photogrammetric software.

UltraCam has industry-leading camera productivity and has set the quality standard for aerial imagery. GXL Aerial extends the UltraMap workflow and enhances the customer experience by offering a tailored, complete workflow.

Through PCI Geomatics' scalable technology, the complete workflow will take advantage of parallel processing and GPUs to automatically orthorectify and mosaic thousands of UltraCam images per day.