CARDINAL SYSTEMS, LLC

Software Solutions for the Photogrammetric Industry

Cardinal Systems, LLC, a privately owned company located in Flagler Beach, Florida, USA, was formed in August 2000 when founders Jane Smith and Mike Kitaif joined forces to market their core product, VrOne, and develop ancillary products to work in conjunction with it. Their goal is to develop a full suite of cost-effective software solutions for the photogrammetric industry.

Over twenty years ago Mike Kitaif developed the photogrammetric mapping software CADMAP. While it was very successful, towards the end of the 90s both the software and the MS-DOS and UNIX operating systems it ran on were beginning to show their age. This was at a time when Windows was beginning to take over the desktop. In 1998 Mike decided to develop a new photogrammetric package from the ground up to take advantage of Windows and the latest software development technologies, such as object-oriented programming (C++). The result was a new, stand-alone Windows-based mapping program named VrOne, a vector-based collection and editing package designed to handle all aspects of photogrammetric map creation. While keeping traditional functionality, it introduced new features to help in the mapping process.

Product Development
At the end of 2000, Cardinal Systems hired Tom Blankenship, who has been developing photogrammetric software for over fifteen years. His first task was to add stereo-viewing capability to VrOne. A new Softcopy program, VrTwo, was released in 2001, adding stereo collection and editing capabilities to VrOne. Since its introduction there have been various additions to the program:
- orthophoto generation package â€“ VrOrtho; a stand-alone application that generates orthorectified images from raw images and ground-surface data and may be integrated directly with VrOne and VrTwo or run alone
- orthophoto mosaicking package â€“ VrMosaic; a standalone mosaicking application that seamlessly combines orthophoto images to produce final output images
- Aero-Triangulation (AT) package - VrAirTrig; a full AT measurement and adjustment package using either built-in adjustment tools or interfacing with third-party adjustment packages.

Translators were also developed to and from all popular CADD systems. In 2005 we want to complete the integration of the real-time AT adjustment solution embedded in VrAirTrig. This will enable users to use a keystroke to visually check and re-read measured points or add unmeasured points whilst still in the adjustment process.

Production Enhancement
Our mission is to develop affordable mapping software products that are simple to use and cover most needs of both private and government photogrammetric mapping offices from one supplier. We are dedicated to developing software that provides solutions for the core needs of production-oriented photogrammetric offices. We feel it is important to stay focused on key technologies and features that help in the everyday mapping production workflow. The traditional workflow of feature collection requires a complete feature to be collected before starting a new one. Such a workflow leads to a highly restrictive method of serial feature collection; operators are forced to collect data in a certain way based on mapping software design. We were determined to find a way to fix this problem and one result is Application Overlaying in VrOne, in which multiple mapping functions may run simultaneously. With this feature a map may be collected by region instead of by feature. Another example of a production-enhancing feature is the recently introduced Vr Touchscreen hardware option. The customisable 7” dynamic LCD touchscreen allows a user quick access to mapping commands while leaving valuable screen space available for map display.

Software Reinvestment
Marketing and advertising are kept to a minimum so that the majority of our revenue can be reinvested in software. Our pricing structure is also simple, straightforward and competitive, so that all customers are treated equally. Our maintenance contracts provide value to our customers by giving them unlimited support and providing continual enhancements and upgrades. Part of our mission is to remain committed to providing superior service and support. We realise that waiting for a response is costly and frustrating. Mike Kitaif’s personal commitment to customer service results in telephone support being available 24 hours a day and emails are always responded to promptly. Both Mike and Tom really welcome the opportunity to discuss, train, explain and improve their software. We must and will continue to listen to our customers and dedicate our resources to writing software that will help them solve their problems.

Global Spread
Cardinal’s core group of users has historically been small to medium-sized privately owned North American companies. These firms need to be flexible in their marketplace and want to deal with as few software suppliers as possible. As our reputation has spread, so Vr Mapping Software is now being used in Australia, Belgium, Canada, Colombia, Denmark, Hungary, India, Italy, Mexico, New Zealand, Slovenia, Spain and the United Kingdom. Large companies, together with state and federal government agencies, are also beginning to appreciate the advantages of software developed in more recent times. It has always been a difficult decision for large users to change platforms, due to the initial investment and training costs involved. However, the savings gained, along with higher productivity and the lower maintenance expenses of more efficient software can easily offset investment.

One Fits All
In 2004 BAE Systems selected VrOne as data capture software to partner its softcopy system. This alliance is helping to bring knowledge of our products to areas and parts of the world that had previously seemed unattainable. We have also recently been approached by NASA and, after running various tests, have prepared a proposal for use of our Vr software to map orbital re-entry tile damage on the Space Shuttle from prior downloaded images. This is an exciting opportunity to be involved in such an important venture. As mapping technologies continue to merge, photogrammetrists, surveyors and GIS specialists are all becoming increasingly part of the ‘mapping’ community. This is highlighted by the growing trend towards bringing these three once very differing careers into the same licensed profession. Our aim is to diligently continue to develop software under the adage of ‘one platform fits all’.

As second and third world economies improve, we hope our software solutions will assist these nations to manage their resources. Cardinal plans this year to create alliances with major partners in the Middle and Far East, Africa and Australia.

Change and Challenge
In the last five years the photogrammetric industry has experienced more change than at any other time, except maybe at its inception. Commercial pressures resulting from outsourcing, and rapidly changing technologies, have made efficiency critical. No longer is an attitude of ‘it’ll do the job’ acceptable; software has to do the job well. Instruments such as Lidar, inertial systems, airborne GPS and digital cameras all require software solutions. The large amount of data they create requires constant research and development. We continue to write software that enables our users to utilise these new technologies while still working in their comfortable Vr environment.

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