

## SMARTTECH, SOUTH AFRICA

# Sparking New Markets for Photogrammetry

SmartTech was established in 1996 in Cape Town, South Africa by the current president, Spencer Allen. The company is dedicated to the development of software for surveyors, photogrammetrists and related professions. Our goal is to provide practical, efficient and cost-effective solutions, from raw field-data to final product, electronic and/or hard copy.

Prior to the official registration of SmartTech as a closed corporation in 1997, we recognised a definite need for survey-related tools which could bridge the gap between raw field-data and data analysis and design systems such as GIS and engineering design applications. Out of this need the uSMART mapping system was developed and over the years it has grown into a comprehensive application.

### Creative Co-existence

At the time the company was starting up the then predominant CAD system, MicroStation, was also establishing itself as a market leader, in use by many mapping professionals and in particular by photogrammetrists. Seeking not to reinvent the wheel we opted to develop survey-related applications that might co-exist with MicroStation, thus making use of the extensive toolbox of functions already available. By doing so we were able to focus on where we felt the major need lay, namely in survey and mapping tools.

uSMART is thus able to use virtually any type of raw field-data and process this into final usable plans, maps and electronic data for user analysis and design. It is able to directly interface with many differing hardware devices, including [total station](#) s, GPS systems, and analogue, analytical and softcopy stereo-plotters. Currently our largest seller is the uSMART Softcopy system, which is able to use raw digital images and create final true orthophotos without the need for any other external software. A comprehensive toolbox of functions achieves this:

- *Base Mapping* for all user mapping requirements
- *Softcopy* for applications such as project, camera and lens set-up, inner orientation, exterior orientation, stereo visualisation, data exchange and data manipulation. The close-range option is also included in this module. Mining companies, for example, find this extremely useful for volumetric calculations, pit stability analysis etc.
- *Auto-correlation* for automatic inner orientation, relative and aerial triangulation, DEM creation, dynamic semi-automated mapping etc.
- *Aerial Triangulation* for comprehensive aerial triangulation, observation, editing and bundle-block adjustment calculation tools
- *Orthophoto* for the creation of seamlessly merged, balanced and feathered true orthophotos.

### Our Philosophy

Photogrammetry has traditionally been used extensively in medium to large survey. But because both analogue and analytical stereoplotter systems have always been very expensive, smaller survey companies have not been able to apply photogrammetric solutions, lacking the large capital outlay required. Digital Photogrammetric Workstations (DPW) or softcopy systems have changed this paradigm. Even relatively small companies can now become involved in this market; a consortium of small or medium-sized companies can undertake large projects with capital outlay typically one tenth of that needed before. The ease of use of Softcopy Systems digital cameras with a smaller footprint, and their much lower cost, mean they can be effectively used to create truly seamless maps and orthophotos. Models can be swapped instantaneously, without the laborious set-up procedures involved in analogue and analytical systems. Even small-scale surveys can now be undertaken using photogrammetry and, if necessary, unconventional airborne vehicles such as microlites, balloons, and Unmanned Aerial Vehicles (UAV). Many new markets are opening up to innovative users employing photogrammetry in their business strategy and many of these are our clients. Traditional photogrammetric companies changing to softcopy systems also have this technology available to them and they have the added advantage of experience, as the basic principles of photogrammetry still apply.

### International Scope

Our product is used by many private and government organisations around the globe, including the South African national mapping agency, Chief Directorate Surveys and Mapping. Ours is the most widely used software mapping system within the photogrammetric fraternity in South Africa and it also enjoys good support internationally, with systems in countries such as Swaziland, Namibia, Spain, Iceland, United Kingdom, Sri-Lanka, United Arab Emirates, Australia, Japan, Zimbabwe, Indonesia, Malaysia, Norway, Sweden, Denmark and Romania. We actively conduct business, wherever possible, internationally. We believe in offering 'single accountability' solutions and therefore include in our range of products the affiliated hardware, such as PCs, hand-wheels, foot-disks, foot-switches, 3D mice, and passive and active stereo viewing products. Our target markets include surveyors, photogrammetrists, geologists, civil engineers,

hydrographers, remote sensing and GIS experts. Our training courses are tailored to each client's needs and may be run at our offices in Cape Town, or on-site. We rely heavily on 'word of mouth' for sales, satisfied clients often recommending our products to potential clients. Having no global advertising policy, as such, we often find requests for our products in unexpected regions. Once one or two systems are established in a region, the demand from other potential users inevitably grows.

#### Into the Future

Customer support and satisfaction has and always will be a major component of our business plan. Research and development is therefore conducted with this in mind. We rely heavily on feedback from our clients to correct, adapt and modify our products in order to meet their ever-changing needs. One initiative aimed at meeting needs for cost-effective solutions is our new UAV project, internally referred to as the 'helicopter project'. A major cost of any photogrammetric task concerns flying and photographing. These costs mean that small to medium surveys are often executed using ground-survey techniques. We are currently developing methods of reducing the cost component with systems for and utilising UAVs. There are three primary goals for this project:

- reducing costs and turnaround time for obtaining stereo pairs for small to medium-sized surveys
- achieving accuracies similar to conventional, large-format photogrammetric cameras
- offering a one-stop (turnkey) solution so that clients can achieve the above two goals.

The future certainly looks exciting, both for SmartTech and our clients.

---

<https://www.gim-international.com/content/article/sparking-new-markets-for-photogrammetry>

---