

GIM INTERNATIONAL INTERVIEWS DR TADASHI SASAGAWA, DIRECTOR, PASCO CORPORATION

Turning Research into Practical Solutions

PASCO is a major remote sensing and GIS company in Asia. Director Dr Tadashi Sasagawa was interviewed on subjects covering present and future technological developments and the geographical expansion of the company, which is keen to turn academic research findings into practical solutions.

What is the field of expertise of PASCO and what are your strong points?

PASCO has over fifty years of experience in remote sensing and GIS. We are specialised in GPS, digital photogrammetry, laser scanning, GIS, remote sensing, spatial data visualisation, and integration of geomatics techniques for applications such as civil engineering, architecture, 3D visualisation and modelling, and geo-technical monitoring. We can provide advanced geomatics technology and high-resolution spatial data with GSD of 50mm or less. With my young and energetic group at the GIS Institute, many of whom hold a doctorate degree, I have been involved in developing a number of automatic data processing and modelling systems for quick and reliable processing of geomatic data. We are strong in collecting spatial data of high resolution and then processing it automatically. Dedicated project managers or a range of experts have carried out several geomatics projects including activities such as data collection, software development and computational analysis. Our Overseas Division has carried out various international projects through Japan's Official Development Assistance in Southeast Asian countries, the Middle East, Africa and China. In China, Thailand, Finland, the Philippines and other parts of the world the company operates both on its own and with a joint-venture partner targeting viable large and multidisciplinary projects.

In what geomatics applications is your organisation more specifically involved?

In addition to conventional aerial film cameras, PASCO is equipped with multi-line digital optical ADS40 (three units), large-format UltraCam-D (three units), Lidar (ALS50, two units), Hyperspectral (AISA, Eagle and Hawk) and Thermal (TABI) sensors. All these sensors are integrated with GPS/IMU systems. We also do ground and ship-borne surveying: we are renowned for our precision-measurements technology. We have implemented heliographic antennae, guide-ways for high-speed linear motor cars, and have carried out surveys for dam, tunnel and bridges. Our ship-borne multi-beam sonar system has been used for several hydrographic surveys. Our REAL system is capable with its built-in laser and digital camera systems of generating image data related to road conditions. We are also progressing towards worldwide GIS business activities by establishing comprehensive partnerships with other major geomatics firms around the world. We have introduced GIS solutions in the public and new private sectors. Our GIS solutions play an important role in activities such as environmental studies, management of land and marine resources, monitoring urban heat-island phenomena, urban growth, realistic 3D urban modelling, real-estate transactions and tourism. We are strong in deriving thematic information from newly captured data. We have the expertise to handle remote sensing activities ranging from field measurements to image analysis. Applications are land-cover mapping, ecological monitoring, terrain modelling, ground deformation monitoring with multi-spectral, hyper-spectral and thermal imaging, geological application, hydro-logical studies, 3-D visualisation and interpretation.

What are your own main activities and initiatives, past and present?

My foremost task involves finding profitable new remote sensing sensors and developing new image processing and computer vision-based data processing technology. I am also working on automation of data processing for natural resource mapping, disaster-systems development, 3D models, data fusion, public and government-related projects. I have been gradually implementing a system for image-matching, mosaicking, fusion, 3D geometry extraction, texture modelling, and so on. Using such a system PASCO is able to process any kind of data. I have introduced new digital sensor technology within the field of GIS and mapping in Japan. We have also entered into satellite business; for example, by becoming a Direct Access Partner of Infoterra of Germany for the exploitation of Terrasar-x satellite. We will not stop with this, and remain focused on more new satellite business for the benefit of government agencies, public and educational institutes.

What are the latest trends in photogrammetry and GIS in Japan?

Today most of the geomatics companies in Japan have their own digital maps, which conform to Japanese Mapping Standards and are generated from high-resolution airborne digital sensors. Companies are allowed to procure any kind of high-resolution image sensor for mapping purposes and most have also been engaged in governmental mapping projects. Quick updating of information with more reliable data is required. The trend will therefore be exploitation of new data from forthcoming very high-resolution sensors in the various unexplored windows of the EM spectrum, using narrow bands. Accordingly, new high-resolution sensors will be introduced every year.

What is the future of geomatics in Japan?

The time factor plays a major role for any surveying project. We have our own geomatics tools, ranging from advanced sensor carriers (aeroplane) to best map-plotter and other digital visualisation instruments; government agency dependence on PASCO is high. Thus the future is bright. GIS has become the backbone of the IT industry; Japan's GIS industry has been functioning well with the support of government and public agencies. Particularly in the fields of administration, disaster prevention and the environment, utilisation of GIS has been progressing steadily, with local government as main actors. Commercial applications for airborne sensors lie in mapping, construction, infrastructure, tele-communications, agriculture, forestry, insurance and disaster management.

Within the domain of geomatics, what is the level of public-private partnership in Japan?

Most Japanese companies in the field of geomatics are public service-minded, with a long history of innovation and successful application of GIS and related technologies. Many municipalities intend to use GIS for tasks such as property-tax collection, resident registration, infrastructure management, and in urban planning and emergency work in disaster scenarios. There is large-scale public participation in most GIS or imaging projects. Information and communication technology has changed the thinking of geomatics firms towards using web-based GIS accessible from home (using ADSL) or on the move (PHS). For example, many hotels, bookshop, hardware-software, petrol station, shopping centre and other chain entrepreneurs have been very efficiently using GIS for sales promotion. The public can locate and reach them using any GIS which is exclusively available for these public use-oriented industries. Advanced GIS even provides easy route access, 2D images and 3D information at no cost. Updating of the information is no problem thanks to the latest mapping systems being available at geomatics firms throughout Japan.

Why are most remote-sensing companies in Japan not involved in the satellite data business?

Japan is the only country where geospatial information has been consistently updated. We also have all kinds of base-maps with up-to-date information; one can get up-to-date, reliable maps of Japan at large scale. This is, among other reasons, because the land area of Japan and the area extent of urban or suburban regions are very small; thus only airborne imagery enables cost-effective, accurate and detailed thematic mapping. Satellite imagery, with its lower resolutions, is not suitable for this.

What kind of business do you plan with your new technology?

PASCO Geomatics specialises in providing transfer of results from leading-edge research carried out by our various experts. This is done through the provision of techniques available to us in geomatics-related subjects or through the commissioning of specialised consultancy projects with universities and other world-class organisations.