# GIM INTERNATIONAL INTERVIEWS GOTTFRIED KONECNY

# A Brilliant Career

Professor Gottfried Konecny, one of the most respected names in photogrammetry, shares some reflections on his work and profession. He worked in post-war Neumarkt as a teenage draughtsman, was chief surveyor on the 1965 Canadian Mount Kennedy expedition, mapped the lunar landing site at NASA, and has been involved in nearly all the European space mapping missions. And these are just some of Professor Gottfried Konecnyâ€™s extraordinary achievements. Today emeritus professor at the University of Hannover, he shares withGIM Internationalsome of the highlights of a career in photogrammetry that has spanned well over six decades.<P>

*Why did you choose a career in photogrammetry?*

When you are young, many of the decisions you make are based on circumstances. In my case I was a child who liked maps and I spent a lot of time drawing them. When the war came to an end, although I had not completed high school, I was given the opportunity to work with a surveyor who was looking for a draughtsman in what was then Czechoslovakia.

In 1946, my family moved back to West Germany and I was employed by the City Survey Office in Neumarkt, a town that had been destroyed by bombs. My mother then insisted that I complete high school, after which I went to university in Munich to study survey engineering. It was an extremely regulated and theoretical environment to be in, and it was only when I took a summer job in Finland that I became aware of the practical applications of photogrammetry. There my interest in making maps from photographs was sealed.

I subsequently applied to Ohio State University, was accepted and had the opportunity to study under Professor Fred Doyle. After that I returned to Germany to complete my doctorate. It was not possible then to use photogrammetry for surveying, as it was not deemed sufficiently accurate. I decided to go to the University of New Brunswick, where I set up a department for survey engineering that offered the first English-speaking undergraduate and graduate degree programme in Canada in the areas of surveying, geodesy, photogrammetry and cartography.

*What have been the highlights of your career?*

I was chief surveyor on the 1965 National Geographic Society Expedition to Mount Kennedy in Yukon, then the highest unclimbed peak in North America. Following the assassination of John F Kennedy, the expedition guided Bobby Kennedy to the top of the mountain, which was then named in his brother’s honour.

In 1966, I spent a sabbatical year at NASA, where I got to work on the Apollo programme, designed to land humans on the Moon and bring them safely back to Earth. From returned photography of the lunar surface I mapped twenty lunar landing sites; a tremendous challenge, as the images were developed in space and transmitted digitally to Earth. It was during this period that I learnt an enormous amount about computers.

In 1975 I submitted a proposal to the German Space Agency for sending metric cameras into space. It was accepted, and I became a project scientist for the metric-camera experiment on space shuttles for the European Space Agency’s first Spacelab mission. I was also a member of the project team for the MOMS (micro-opto-mechanical systems) sensor on space-shuttle flights and the Mir space station.

My role in the International Society for Photogrammetry and Remote Sensing (ISPRS) has also been a great personal achievement. I was secretary-general from 1980 to 1984, and president from 1984 to 1988. This came about after I had applied for a professorship in Munich and been turned down.

*How has photogrammetry evolved from when you first entered the field?*

I remember working as a photogrammetry operator for the Ohio State Highway Department. Back then we had to use analogue photogrammetric plotters, meaning the imaging geometry is reconstructed through optical or mechanical devices. When I returned to Munich in 1956 I was introduced to analytical stereo-plotters, which use stereo photographs to determine elevations. These were very different from the analogue devices. While at New Brunswick, I became involved in writing software for analytical plotters. It has been very interesting to witness the developments in digital photgrammetry. The availability of digital space imagery expands the data sources used in GIS for analysis and mapping purposes, and it is proving an even more effective means for mapping the Earth’s surface.

*What are the most prominent trends in photogrammetry today?*

I was lucky to have Christian Heipke as my successor. His dissertation candidates all work in the area of automation. Considerable progress has been achieved in the automation of image orientation for photogrammetry and remote sensing over the last few years. Automation is cheaper and faster, but what is not so cheap is feature extraction; as a result, this is being done in places like China and India, where quality control can be a problem.
Another major issue is that automation cannot be used for all topographic mapping, but can be used effectively for extracting features such as roads, buildings and vegetation.

What effect will ongoing technological advancements (computers) have on the surveying profession?
The greatest advances in information technology have taken place as a result of space programmes and military requirements, both of which have generated huge spinoffs for our industry. The ongoing development of surveying technology will continue to depend on these two sectors.
It will also rely on further increases in speed, storage and networking capabilities. It's worth remembering, however, that developments in computer technology are merely tools; the simultaneous development of surveying applications must follow if we want to continue progressing.

*What effect is the current financial crisis having on geomatics?*
Governments will decide what to invest in infrastructure, and our industry is dependent on that expenditure, whether on maps, cadastres or navigation systems. Private investment in geomatics will only be worthwhile if the business sector can convince government that its solutions are better and faster. Ultimately, the benefits of this industry are aimed at the public sector, and government funding is critical.

*Two new developments in photogrammetry are georeferenced oblique aerial imagery and satellite imagery up to 40cm spatial resolution. What impact will these have on possible applications of geo-information?*
Everybody likes to look at beautiful three-dimensional city models, but good looks alone will not generate the funding required for the application of geo-information.Pictometry is one example of the problems posed by a patented image-capture process. In the US, however, the company's imagery and technology are in great demand due to the focus on homeland security. The development of applications that use highly sophisticated imagery will depend largely on this type of demand, and on emergency-relief needs. What Naomi Klein scathingly calls 'disaster capitalism' (website 1) is used by corporations to develop products that make them a healthy profit. The fact is that conflict and disaster drive developments in the geospatial industry. Think of how the 'space race' became a vital front in the cold war, and the impact that had on the development of GIS technology.

*Many people are working on the automatic extraction of information from digital aerial and satellite imagery. What is your view of possible success here?*
I'm in agreement with my successor Christian Heipke that success rates of 80% to 90% are achievable, but not more than that. Complete automation will never be a substitute for the human brain. The first people to realise that were analysts working at the European Satellite Centre over fifty years ago, when they employed professional photo interpreters – and not computers.

*Many international geomatics education programmes face the problem of low student numbers. What are your recommendations to reverse the trend?*
There is no doubt that education will fuel the professional development of geomatics, but the frustration is that there are too many programmes; in Germany alone there are nine universities offering degrees in the field, as well as fifteen academies. Consolidation is necessary to prevent further dilution of student numbers. We would benefit from having no more than four programmes in this country; that would not only strengthen the geomatics community, but would also ensure that students are offered a superior product.

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