CYBERCITY

Reality-based Virtual 3D-Models

CyberCity is an international 3D-geo-information company specialised in generation, distribution, analysis and visualisation of 3D-city and facility models and photo-realistic 3D-landmarks. The Swiss-based company with headquarters in Urdorf (Zurich) works with a daughter company in Los Angeles, CA, founded in 2003 (CyberCity 3D LLC) and, as from this year, with a joint-venture in China (Lingtu-CyberCity).

CyberCity AG was founded in 1999 as a spin-off from research carried out at the Swiss Federal Institute of Technology (ETH) in Zurich. The privately held company is managed by Franz Steidler (CEO), Xinhua Wang (CTO) and Kilian Ulm (CSO). Initial projects were conducted for municipalities (3D-City models) and industrial companies (3D-facility models). The original research version of the software CyberCity-Modeler was gradually improved, commercialised, and extended with sophisticated new modules. The resulting software enables a high degree of automation in producing 3D-models from airborne data. Today (semi-)automatic texturing of facades from (oblique) aerial images is possible.

CyberCity-Modeler

Research leading to the creation of 3D-models using aerial imagery began at ETH in 1995. From work on 3D-feature extraction for building objects from photogrammetric stereos there emerged CyberCity-Modeler for the semi-automatic generation of 3D-models. More and more interest from the commercial market led to founding of the company and over subsequent years to extension of the software. Modules for editing the 3D-geometry and texturing using terrestrial photographs were developed. Today CyberCity-Modeler even contains a Digital Photogrammetry Workstation targeted at the creation and updating of 3D-data, and a texturing module that allows (semi-)automatic texturing from (oblique) aerial images. The 3D-models are delivered in major formats, including the well-known commercial GIS ones (e.g. Shapefile, Geodatabase), CAD (e.g. DXF, DGN) and visualisation (e.g. VRML, OpenFlight, 3DS) and interfaces with ArcGIS (ESRI). Its background in photogrammetry has meant the company has always focused on semi-automatic feature extraction from stereo aerial images. With the growing demand and availability of laser-scanner data (Lidar), the software was extended to create 3D-models from point-clouds acquired by airborne laser scanners. Recent research indicates that the future for 3D city modelling lies in combining photogrammetry and laser scanning, and as a result our research and development focuses on this subject.

Strategic Partners

Our mission is to provide various markets and applications with state-of-the-art 3D-building models derived semi-automatically from stereo aerial imagery (photogrammetry) or laser-scanner data. In the early years the market was limited to city administration, government agencies and telecommunication companies. Today 3D-data along with True-Orthophotos (TOP) and Digit–al Terrain Models (DTM) are used in urban planning, GIS, architecture and engineering, car navigation, tourism, the property market, homeland security, entertainment, city marketing, simulation, and many more areas. The requirements of the markets and applications demand flexibility and intensive interaction with the marketplace and with research. We have established partnerships with leading companies in different markets. Some examples are the production of German 3D-landmarks for Harman/Becker Automotive Systems and, since 2004, a distribution agreement (Public-Private-Partnership) with the State-Office for Geo-information and Survey (LGV) of the City of Hamburg and ESRI Business Partner (Developer Program). A distribution contract was recently signed with Pictometry International Inc to market our 3D-models with textures taken from its oblique aerial images. We are also co-operating with ViewTec to provide TerrainView-Globe, sophisticated 3D-real-time visualisation software for high-end applications.

Service, Data and Software

From the start our business model has been to offer expert services and capacity, and software and software development for the generation of 3D-City Models. As a result, we act as a complete service and product provider that produces high-quality geodata including 3D-City Models, digital True-Orthophotos, Digital Terrain Models, and integrate data and know-how into 3D-real-time visualisation and GIS systems. The co-operation with Harman/Becker Automotive Systems to create an area-wide dataset of highly detailed and photo-realistic 3D-landmarks of Germany resulted in extension of our portfolio to offer 3D-Landmarks derived from terrestrial laser scanning and photographs not limited to geographical boundaries. Today we offer 3D-City Models and landmarks along with ortho-imagery and terrain data from a global and on–going extended 3D-data library including Paris, Hamburg, London, Los Angeles, San Diego and Chicago. These datasets can be approached online at various levels of detail (LOD) and with various facade textures. A Data Exchange Program has recently been developed with cities across the US to exchange high-resolution stereo aerial imagery for 3D modelling and visualisation services. We will use this data to produce 3D-city models in ESRI-specific formats and deliver them to programme participants. We will then sell the 3D-data in partnership with ESRI Inc through its ArcGIS On-line data services. Growing interest on the part of private companies, and new circumstances regarding export of aerial imagery in geographical areas such as China and the Middle East has led us to establish a "CyberCity Technology Partner Program". An exclusive number of companies or organisations with which synergies with CyberCity have been proven may license the software on an annual basis and conduct commercial projects.

Global and Dynamic

CyberCity faces a global, very dynamic and diverse 3D market. Today our main markets are in Europe, North America, Asia and the Middle East. The use of 3D-City Models started within city administrations for urban planning, architecture, GIS applications, noise

propagation, flood modelling and so on. In addition to 3D-City Models, the demand for facility-models is also growing. These and their visualisation are used for planning/engineering purposes, safety and security applications, and marketing. Examples of some we have generated are Zurich International Airport, Switzerland, Infraserv Hoechst in Frankfurt, Germany and car manufacturer Audi in Ingolstadt, near Munich in Germany. Generally, increasing availability and coverage of 3D-data drives demand, such as car-navigation systems, web-based portals, the game and entertainment industry, and many more.

Future

Technological advances in computer systems and bandwidth will support the development of the 3D market. Faster processors and graphic chips will increase the performance of visualisation and GIS systems. This progress, and the continually increasing demand for 3D-data and its use, will drive user-friendliness, diversity and complexity of 3D-analysis functionality in GIS systems. Web-based solutions will dominate more and more. We expect a significant growth in business in the 3D market and we are ready to contribute our part in generating high-quality models for large areas to be offered directly from our data library. The evolution from the "nice-to-have" to the "need-to-have" of a 3D-model is progressing.

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