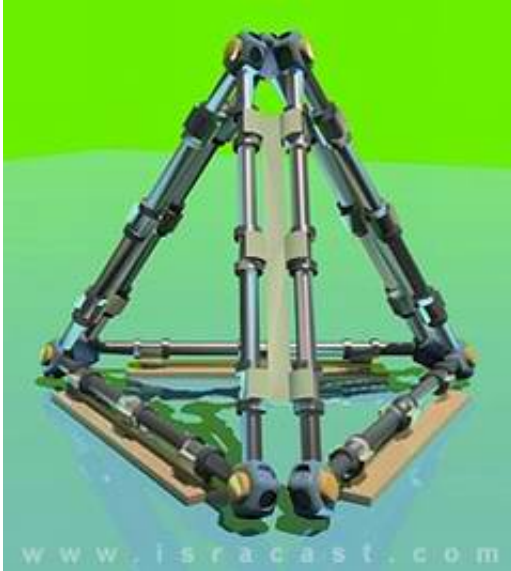


Surveying The Future

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A new low cost system that illustrates immediately a 3D model of a room has been developed by an Israeli company. The system facilitates the performing of highly accurate computerized measurements inside buildings. It allows a single operator to measure a room and create a CAD (Computer-aided design) model in real time which can then be used to plan the further development of the interior structure. Relying on ultra sound and RF transmission between its base station and a portable unit, the new system eliminates limitations such as line of sight and the need for "open skies" that exist in current surveying equipment, while still keeping the price of the overall system well below that of existing

equipment.

Image above: Three QS Bases assembled in a triangle pyramid structure

Surveying is an age old profession. Some of the first surveyors came from ancient Egypt where they used various tools including knotted ropes to measure distances for construction work and other applications. More sophisticated measuring instruments have been devised over the years and in the last few decades two such important instruments created a revolution in the world of geodesy. The laser range finder and the Global Positioning System (GPS) helped to dramatically improve the accuracy of measurements, ease of use and the overall cost of surveying operations.

Despite these important advances even the most up-to-date surveying systems like the Real-Time-GPS (RTK-GPS) and the "Total Station" (TS) still have their limitations. RTK-GPS still requires "open sky" in order to receive the satellite signal and thus is limited when performing measurements indoors, in high density built areas, afforested areas, etc.. TS is limited by line of site, and lighting conditions in the area. All existing systems require the use of a "measuring rod" and sustaining it in a vertical position. The existing systems are also expensive, starting at tens of thousands of dollars per unit, and are used mostly by professional surveyors.

To overcome these limitations a team of Israeli professional surveyors and engineers set out to create a revolutionary new device called QuickSurveyor. The new system is composed of two units, a base station and a lightweight mobile unit called Rover. The Base station is essentially a 50cm high metallic pyramid with nine tiny RF and ultra sound transmitters / receivers built into it. The Rover is a portable unit shaped like a telescopic rod 1meter in length, which can extend up to 3m to help measure high ceilings, and other hard to reach places. The rod

includes 3 sensors triangular in shape and can be aided by laser distance meter to increase its range. The Rover unit can also include a handheld computer which shows the measurements' progress in real time.

Alternatively, the Rover can transmit the data to a laptop placed nearby.



Illustration of the system

In the current prototype stage of development, the Rover can operate in a radius of approximately 30m from the base station and create a 3D model of the measured area with an accuracy of about 2cm within less than a second. In the finished product the accuracy level should improve to about 5mm (almost the level of accuracy of the much more expensive TS system). The range of the QuickSurveyor might also grow in some versions of the commercial device to about 200m. The current prototype uses the industry standard AutoCAD software to create a real time 3D model but other CAD applications can also be used, as well as cheaper DATA COLLECTORS and simpler geometrical processing software such as COGO. The estimated price of the commercial version should be between \$3,000 and \$10,000 depending on the system configuration.

The measuring process is much simpler than that of existing systems. The surveyor places the base unit in the center of the area being

measured and starts walking with the Rover unit in his hand. By touching a wall, ceiling or window with the three sensors at the end of the Rover, the surveyor establishes a coordinates for the system which immediately turns it into part of a 3D model of the room.



"As built" - in real time

EZ2CAD, the company developing the QuickSurveyor, is currently in advanced stages of creating a working prototype. EZ2CAD advisor Benny Marcus told Isracast that the market for surveying systems like the RTK-GPS and the QuickSurveyor is currently estimated to be more than \$3 billion annually and should grow to more than \$5billion by 2008. Marcus explained that the QuickSurveyor will serve as both as a low price substitute for existing systems and also to complement and improve the performance of the existing equipment. As a consequence, the QuickSurveyor will be aimed not only at professional surveyors but also at architects, building contractors, interior decorators and appraisers who have not used the existing equipment due to its complexity and high price.

EZ2CAD is currently looking for investors for the first stage of R&D as well as the later stage of creating a commercial product. The company

plans to market its innovative system in about two years.

by Iddo Genuth - IsraCast

The original story can be found at

http://www.isracast.com/tech_news/010705_tech.htm

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