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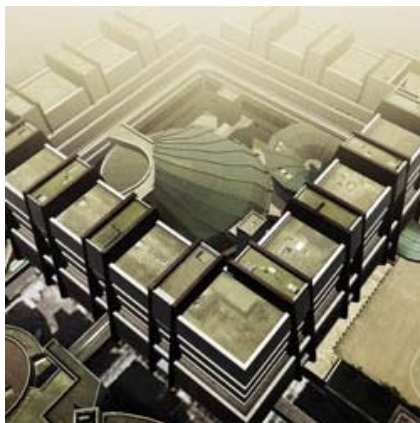


## MODELING, GEOINT CONVERGE

Written by Scott Allman



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**Virtual Environments Provide A Safe And Secure Setting For Threat Analysis, Rehearsal And After Action Review For All Mission Types.**

Imagine the possibilities if you could visualize your destination, down to a bench on a street corner, before you go there. That's precisely what a group of geospatial modelers from Huntsville, Ala., did—visit Strasbourg, France, without ever going there.

While 3-D technology has certainly progressed within the past few years, the new forefront is higher fidelity at the ground level, using photorealistic textures that provide not just something beautiful to look at, but also higher accuracy that can be utilized when not connected to the Internet/intranet—accuracy that's portable. Enter the world of modeling and simulation.

When the M & S industry converges with the world of geospatial intelligence, the seemingly slow 3-D renderings and worlds of the past take on new life when

**Next Issue** Volume 8, Issue 7

**Letitia Long**  
 Director  
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**Features:**

- LiDAR
- Full Motion Video
- Web-Based Content
- Display Technologies

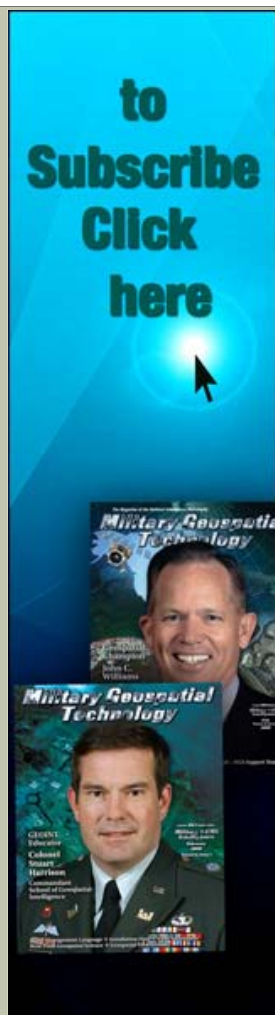
**Industry Interview**  
 Defense Intelligence Information Enterprise (DI2E)

**GEOINT 2010 Symposium Issue**  
 Special Section: **Event Guide**

### UPCOMING INDUSTRY EVENTS

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	26	27	28	29	30	Oct 1	2
		GEOTECH 20					
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
		AUSA Annual Meetin					
	31	Nov 1	2	3	4	5	6
		GEOINT 2010 SYMPOSIUM					





they're given the ability to run in real time on common PC platforms that require no bandwidth over the Internet and can run compressed and resident databases on a standard laptop.

These virtual environments provide a safe and secure setting for threat analysis, rehearsal and after action review for all mission types.

A single, seamless, environment rapidly provides first-person views of any area of interest. This allows the analyst to view the battlefield, plan disaster response protocols, and run action-driven scenarios for embassies, public events, intelligence operations and commercial developments.

Obvious benefits are rapid analysis and a greater situational awareness in a more intuitive interface than a 2-D map or electronic map display. 3-D analysis such as line-of-sight, fields of view, distance measurements, the ability to send and share geo markers, and simulated sensor views provide a unique perspective and chance to collaborate that no other "flat map" can provide.

How are these ultra-high fidelity cities made? In the case of Strasbourg, the ninth-largest city in France, there was no obtainable data, so everything had to be created from scratch. One of the benefits of creating a geospecific virtual city is that the byproduct of the processes involved is new updated GIS data. AEGIS Technologies has a streamlined and optimized set of processes for the development and viewing of complete virtual environments.

#### **COTS TOOLSETS**

Use of COTS toolsets for repeatable and non proprietary processes, combined with the implementation of in house, custombuilt applications, enhances processes to allow for rapid, extensible and open format datasets. AEGIS makes use of the latest in unclassified imagery sources, rapid terrain development and GIS toolsets.

Data extracted, via imagery, utilizes one swath of imagery that has low nadir, and several swaths of imagery that are high off nadir—typically, an off-nadir variable that is over 14. Header data from the imagery is imported for shot location, and pixel variables are defined across building rooftops to define aerial shape features. With this data combined, building heights are derived. Building height accuracy is entirely based upon image pixel accuracy, projection and use of ground controls.

Also during this process, two to 24 sets of non-orthorectified, off-nadir imagery can be imported to virtually "paint" textures across building sides. While this is becoming somewhat commonplace within the visual simulation world today, there are several downsides to this process. Primarily, this depends on imagery resolution. The higher the resolution of the imagery, the more representative this process becomes. Coming from the visual simulation industry, the term "representative" is not used lightly. That term is imperative because it is vital for its very nature—in terms of how it scales into reality and accuracy. When oblique textures are placed onto the sides of buildings, there is always a high degree of inaccuracy.

#### **SUGGESTION BOX**

With stretched textures, especially on tall cultural features towards the base, and moving upwards, missing sections may be present due to line of sight obstructions. That being said, when a virtual dataset is being used for mission planning and rehearsal or Intelligence purposes, misrepresented or undocumented inaccuracies may be detrimental to the final usage.

The solution is to combine off-nadir aerial with ground photography obtained via open sources, video technology, GPS cameras or even non-geotagged photographic sources. Blending these two methods together is vital when creating a seamless virtual environment.

So whether you're "flying" 500 meters above the city, or walking down the streets reading the sign of a coffee shop, if you correctly represent "real" data in a virtual world, you believe you're there. ♦

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