

Gaining Knowledge, Leaving Behind Safety

Students at Atlantic Cape Community College use the Nautiz X7 for hands-on education while building a sophisticated emergency response management system

Colleges have traditionally been pretty transitory places – students come in, fill up on theory, and head out into the real world leaving little trace of having been there. But thanks to the availability of easy-to-use mobile technology, students at Atlantic Cape Community College, located in South New Jersey, will have a lasting impact on the safety of the campus even after they're gone.

That's because the students in Atlantic Cape's Geospatial Workforce Education Program are getting practical, hands-on education by using Nautiz X7 rugged handhelds to build a campuswide emergency response management system. Thanks to their work, and the X7's ability to easily gather, store and transmit geographic information system (GIS) data, emergency responders will have highly detailed and useful information at their fingertips if a campus emergency arises in the future.

A growing need in the labor marketplace

When geospatial technology was identified by the U.S. Department of Labor as one of the nation's three fastest-growing workforce needs, Atlantic Cape set out to meet the demand. The school won a Department of Labor grant to start a new program, and hired Luis Olivieri to assist in the development and management of the project. Olivieri, who has worked with GIS and remote sensing technologies for 20 years, had a research and teaching position with the University of Puerto Rico and worked as a consultant before moving to New Jersey to start the program.

Instead of copying existing GIS curriculum, the program was designed to create one that would match up to the needs of the marketplace. That started with two courses: Intro to GIS and Geospatial Data Collection. As Olivieri considered the technology needs for the courses, he knew that simple GPS units were sufficient for the introductory course. But they wouldn't do for data collection; he needed to find something more suitable. In his words, he wanted to "put students in the field using a real handheld device with more capabilities than a basic GPS unit."

Finding the right solution for the situation

Olivieri started his own selection analysis in a very basic way: He Googled "handheld," which led him in two directions. First, he found Handheld, a supplier specializing in rugged computers (www.handheld-us.com). Second, he found reviews of a soon-to-be-released rugged handheld, the Nautiz X7, that intrigued him. Converging the two topics, he e-mailed Handheld, and was pleased to hear back immediately from Dale Kyle, the company's president.

After talking to Kyle, Olivieri added the X7 to his list of handhelds to research, putting it alongside the Trimble Nomad and the Leica Zeno. He created a detailed spreadsheet to compare the choices on performance, features and price.

"I wanted accuracy to 3-5 meters, real-time connection capability and a good camera," Olivieri explains. "And it had to run Windows Mobile, because we were using ESRI ArcPad software, which runs under Windows Mobile. And finally, ruggedness was very important."

His research revealed that the three models were quite similar in memory, storage, processor speed, screens and accuracy – but the Nautiz X7 came in at a price far less than the others. The school bought 10 Nautiz X7 units.



Challenge

Create a detailed, campus-wide emergency response system that would arm responders with as much information as possible in a crisis situation – and have students create the system as they learn to use GIS technology.

Solution

By using the affordable yet rugged Nautiz X7's array of GIS functionality, students were able to map, photograph and otherwise document hundreds of reference points across campus, both inside buildings and in outside settings.

Result

Emergency responders can call up pictures, floor plans and GPS coordinates to get a clear understanding of any situation before they even arrive on the scene. Students gained marketable, real-world technology skills.

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Integrating the new technology into real-world education

While Olivieri doesn't teach the Geospatial Data Collection course, he helped design it, and he saw an opportunity to accomplish two important goals with one piece of curriculum. He and the course instructor believe students need real-life experience, not just book learning. And a recent Safe Campus Initiative program called for developing "a support system at Atlantic Cape to effectively respond to potential emergencies and manage crises."

Voila: a class project to develop a data-driven emergency response management system.

Here's how it works: The GIS students spread out across the campus and gather data. When they're outside, students use the Nautiz X7's GPS capability to georeference where they are as they enter data, supplementing the GPS coordinates by cross-referencing locations on aerial photographs of campus that are pre-loaded on the X7. Inside buildings, they're able to note locations on building floor plans, also loaded on the handheld. (They're also cross-checking building floor plans against actual layout to find any changes or discrepancies.)

As they establish where they are, they note the location of building entrances and emergency exits; classrooms, laboratories and offices; fire extinguishers, sprinklers and alarms; electrical shut-offs; hazardous materials – anything an emergency responder would benefit from knowing. They enter their notations directly into the X7 using the ESRI ArcPad program, and also take contextual photos with the handheld's 3-megapixel camera.

A better way to gather, store and transmit data

After students gather data and store it on the X7, they take the handheld back to a central lab and upload the data to a central server using ArcPad.

"In the past, the students would have had to carry around a big paper map, find a spot they need to enter, make handwritten notes on a notepad, and then come back to the lab and enter the data manually," Olivieri says. "This is unimaginably better."

The next step is to distribute the data. The goal of the program is straightforward: "In an emergency, time is very important. It could be the difference between life and death," Olivieri says. "We are putting together the data required for emergency personnel to act in the fastest possible way." The school wants a system where police, firefighters, EMTs and any other emergency responders can respond not just more quickly, but also more effectively.

In the long-term plan, the data the students are gathering may be cross-referenced to everything from class schedules to individual information on students, staff and professors. That would provide a highly helpful level of detail in an emergency-response circumstance.

The value of detailed data

Olivieri provides some examples – worst-case scenarios, but the kind of situations schools, government facilities or businesses have to be ready for even if the odds are long that they'll ever occur.

"Let's say there's a fire at the college. Before getting here, the fire department could have evaluated the floor plan of the building – they'll have information on the location and access points to the building and to the rooms where flammable and hazardous materials are stored. They'll also know where the fire hydrants are and relevant information that will assist in a faster and more effective response."

"Or let's say that there's a shooting in a campus building. Before the SWAT team gets there, they know the location of the building and the access points, they have pictures of the inside of the building, they can pinpoint the location where the shooter might be, they know the number of students in the classroom, they have a list of names of the students who are supposed to be in the room then, and they might even have pictures of the students. In case they have to open a door, they know which key they need to use to unlock it.



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Because they have the floor plan of the building and actual pictures taken within the building, they know about potential places where the shooter can hide.”

He sums up the usefulness of the system like this: “Typically emergency responders get to the scene and start asking: Who has the floor plans, can we get class lists, what resources do we have. With this system, it’s like going there the day before something happens – you already know what you’re going to find when you get there.”

All this information will be available to responders through a normal Web interface. No specialized software is needed to access the system – the emergency response personnel will have access to the system via a Web browser, a user ID and a password, accessing maps, diagrams, photos and textual information. The basic system will be complete and ready for use by the end of summer 2010.

Easy adoption, true ruggedness

And how has the process been for the students and their new equipment? So far, so good: The students have taken to the handhelds quickly, although some were intimidated initially by a device unlike anything they had used before. Their excitement to be using a sophisticated GIS tool with an intuitive design and straightforward functions has made them eager to do the field work.

Olivieri does wish now he had purchased a few X7s with cellular connectivity options – using this capability, students could connect remotely to the central server like a cell phone and transmit data directly from the field without having to establish a physical connection.

As far as ruggedness, Olivieri himself got some firsthand experience with the Nautiz X7’s sturdy exterior. He was collecting units to check on them, and he picked up seven at once. “I dropped one, and it bounced off the floor on the rubber corner,” he recalls. “It didn’t have a single dent. And it was drizzling at the time; they all got a little wet. It was a good test.”

Based on the program’s success with the Nautiz X7 so far, Olivieri plans to find more ways to integrate it into the geospatial curriculum.

“A laboratory is not the same as a real application,” he reiterates. “The students need the theory of GIS plus hands-on experience. The X7 handhelds are a very important part of that process.”



For more information about the Nautiz X7, visit our product facts or go to www.nautiz.com

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