

7-9-2013

Insurance Policy

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Recommended Citation

"Insurance Policy" (2013). *News Releases*. 408.
https://ecommons.udayton.edu/news_rls/408

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Insurance Policy

07.09.2013 | Research, Engineering, Faculty

With more than 2 million miles of pipelines spanning the U.S. — impacting virtually every community — the need for advanced technologies to ensure safe operation is essential.

Vijay Asari, Ohio Research Scholar in Wide-Area Surveillance at the University of Dayton, and researchers in his Vision Lab are working on an automated monitoring system to quickly identify threats or damage to pipelines and relay information to pipeline operators and first responders.

The pipeline program and other Vision Lab projects will be on display at 2 p.m. Friday, July 12, when the University dedicates the new and improved Vision Lab in Kettering Labs Room 461.

For the dedication, sample photos from the pipeline project will be on display showing how Vision Lab analysis can pinpoint problems that include heavy machinery, significant erosion or leaks. Asari said the technology could also be applied to bridges, railroads, highways and other areas where secure right of ways and damage assessment.

"Humans do the same thing. They survey the overall view of the scene and then fine-tune again and again to eliminate clutter and other visual noise," Asari said.

But humans can't enhance image clarity by 25 times and drill down to examine different aspects as do the tools developed in the Vision Lab. For example, if investigators want to see into dark shadowy areas, Asari's image enhancement tools reveal what the shadows are hiding. Advanced programs developed in the Vision Lab also can remove fog, haze, smoke, rain and other atmospheric noise.

Asari believes his group can effectively process data from heights of 1,000 to 3,000 feet and provide decisions in virtual real time, 24 frames per second.

Asari's group received \$100,000 in seed funding from the Pipeline Research Council International for a six-month research project to examine aerial images of nearly 10 miles of pipeline right-of-way in northwest Indiana. Recent successes with this project have helped Asari's group establish a long-term relationship with the council and secure an additional \$75,000 in funding.

The relationship with the pipeline council will lead to additional funding commitments that could reach an estimated \$2 million during the next five years for performing pattern analysis and recognition research activities, according to Asari.

The focus of the Vision Lab is to develop new software and hardware in the areas of scene analysis, brain analysis, signal processing, image processing, computer vision, pattern recognition, machine interfaces, object detection and tracking in wide area surveillance motion imagery, and vision-guided autonomous robotic navigation and tracking.

The Vision Lab, with 18 students and 11 collaborating faculty, also develops facial recognition and behavior recognition software.

The Vision Lab also is home to RAIDER, a robot with facial recognition capabilities, that researchers hope one day can be air-dropped into dangerous areas to rescue injured persons. The lab received \$1.6 million for the first phase of a project that started in 2009 from the U.S. Army Medical Research and Materiel Command's Telemedicine & Advanced Technology Research Center.

For more information on the Vision Lab and to see image analysis projects, visit the related link.

Photos courtesy of Brian Cantoni via Flickr

For more information, contact Shawn Robinson, associate director of media relations, at 937-229-3391 or srobinson@udayton.edu.