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## Computer Science Colloquium

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### **The REDOWL: Advanced Sniper Detection System for iRobot PackBot**

**Dr. Glenn Thoren, Program Manager of REDOWL, Deputy Director,  
Photonics Center, Boston University**

**Prof. Allyn Hubbard, BU ECE Dept and BioMimetic Systems**

**Dr. Socrates Deligeorges, President, BioMimetic Systems**

**Aleks Zosuls, Treasurer, Biomimetic Systems**

Wednesday, 12 October 2005

Olsen 311

Refreshments at 2:30, Talk from 3:00-4:00

The Photonics Center at Boston University and iRobot Corp. introduced a tactical sensory system payload prototype, called REDOWL, for the combat-proven iRobot PackBot robot. REDOWL, or Robot Enhanced Detection Outpost with Lasers, can detect and locate snipers and mortars on the very first shot fired at personnel or vehicles.

Dr. Thoren and the REDOWL team will discuss their approach to creating and testing the REDOWL system and the challenges that lie ahead. Videos of the field tests will be shown and an animation of potential future system applications will be presented.

The neural network algorithms and hardware implementation are unique and much smaller than other acoustic direction finding solutions. Dr. Deligeorges and Professor Hubbard will discuss the basis and advantages of the neural network approach. Aleks Zosuls will present the challenges of the Acoustic Direction Finding implementation and field testing.

A new "Generation 3" set of optics is being prepared for insertion in the REDOWL robot in the next few months. There will be further significant miniaturization of the system with the implementation of digital circuits in the acoustic processing layers over the next year. The REDOWL PackBot will perform a live demonstration after the presentation.

REDOWL is a remote, deployable sensor suite designed to provide early warning information, gunshot detection, intelligence, surveillance and targeting capabilities to military forces and government agencies. The REDOWL equipped PackBot has been field tested for the Army's Rapid Equipping Force at a rifle and trapshooting range. Of the more than 150 rounds fired from 9 mm pistols, M-16 and AK-47 rifles from over 100 meters, the REDOWL system equipped with an acoustic direction finding unit from BioMimetic Systems located the source of the gunfire successfully 94 percent of the time.