Research Objective

Apply knowledge of physics, sensors & processing to exploit acoustic signals for military purposes via passive, low-cost techniques.

Challenges

- Highly complex environment – urban, mountain, jungle, low-SNR, dynamic platform, noise interference
- Generally one measurement with unknown originating signal & channel
- Standard computer simulation of propagating signal is computationally expensive

ARL Facilities and Capabilities Available to Support Collaborative Research

- Multi-target detection, tracking & classification algorithms
- Novel array processing techniques achieve better detection and higher angular resolution than standard algorithms
- Extensive knowledge in embedded signal processing
- Extensive experience with acoustic sensors & DAQ systems
- Experimental aerostat allowing unique investigation of acoustic measurements above ground turbulence
- Large database of cataloged acoustic signatures
- Expertise in electronic product development to include design, simulation, fabrication and assembly of electronic circuitry using designer software applications

Ongoing Collaborations:

- U of Kansas, U of Mississippi
- INSCOM, NGIC, Los Alamos NL, ARDEC
- NATO SET-189 & SET-218 TGs

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Advanced, multi-target tracking in noise
- Practical sound propagation models
- State of the art classification algorithms
- Acoustic particle velocity/vector intensity probes
- Calibration facilities
- Expertise in hardware, software & wind noise reduction techniques