Research Objective

- Conduct research and development of all aspects of radar technology for detecting concealed and low signature radar targets of interest
- Applications include ground penetrating radar (GPR) for landmine and IED detection, ultra-wideband radar (UWB), sense-through-the-wall (STTW) radar, and foliage penetrating (FOPEN) radar

Challenges

- Developing high-fidelity radar signature modeling of targets embedded in realistic clutter backgrounds
- Developing advanced signal processing algorithms for synthetic aperture radar (SAR)
- Development of RF interference (RFI) mitigation techniques and strategies
- Development of cognitive radar techniques and approaches for the congested RF environment

ARL Facilities and Capabilities Available to Support Collaborative Research

- High performance computing (HPC) center
- Radar laboratory with network analyzers, scopes, signal generators, etc.
- Vehicle mounted ultra-wideband (UWB) radar testbed
- Indoor airborne SAR emulation facility (Rail-SAR)
- Brian R. Phelan; Marc A. Ressler; Kenneth I. Ranney; Gregory D. Smith; Getachew A. Kirose; Kelly D. Sherbondy; Ram M. Narayanan, "Performance analysis of spectrally versatile forward-looking ground-penetrating radar for detection of concealed targets," Proc. SPIE. 9461, Radar Sensor Technology XIX; and Active and Passive Signatures VI, 94610J. (May 21, 2015)

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Collaborations sought in the following areas: advanced electromagnetic modeling, waveform design, RFI mitigation, all aspects of cognitive radar (hardware and software), advanced processing to enable real time signal processing, advanced radar architectures and design for highly sensitive low noise transceivers, UWB antenna concepts, radar concepts for UAV platforms