

Reconfigurable Arrays and Signal Properties for Urban Sensing

Principal Investigator: Dr. Robert Caverly

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Project Summary:

Hybrid techniques of microelectronics, innovative antenna design, noise, and channel mitigation, and radar and sensor signal processing are used to address important issues in the area of urban radar sensor system design. Urban radar systems perform several different functions, which would otherwise have been carried out by different dedicated systems. They have a high degree of intelligence and flexibility, over a wide range of operating frequencies and bandwidth, and are able to quickly adapt to changes in system functional requirements as well as changes in the sensing environment. The proposed research builds on current technologies of wideband urban radar sensor systems. It cultivates advances in reconfigurable antenna design and electronics, flexibility in waveform generation and alteration, radar image classification, nonlinear motion detection, and target detection to achieve system performance beyond what is presently offered by electronically scanned multi-function sensor systems. Our research efforts span the four areas of array electronics and RF switching, multi-function and reconfigurable low-profile antennas, signal and array processing, and target detection and classification.