

Intelligent Automation Incorporated

Coherent distributed radar for high-resolution through-wall imaging

Progress Report 25

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1 Work performed this reporting period

1.1 Technical work performed in this reporting period

1.1.1 Radar imaging with synchronized Master and Slave nodes

In this performing period, we have focused on radar imaging with the synchronized RF link. Specifically, after synchronizing, we fix the slave node, and move the master node smoothly, collecting raw correlator output continuously. From the starting and stopping time of the master motion, and the known distance, we estimate the relative master and slave positions in 2D (Figure 1). These positions, and the correlator outputs are combined in a backprojection algorithm to form a radar image of the surroundings (Figure 2).



Figure 1. Locations of Master and Slave nodes.

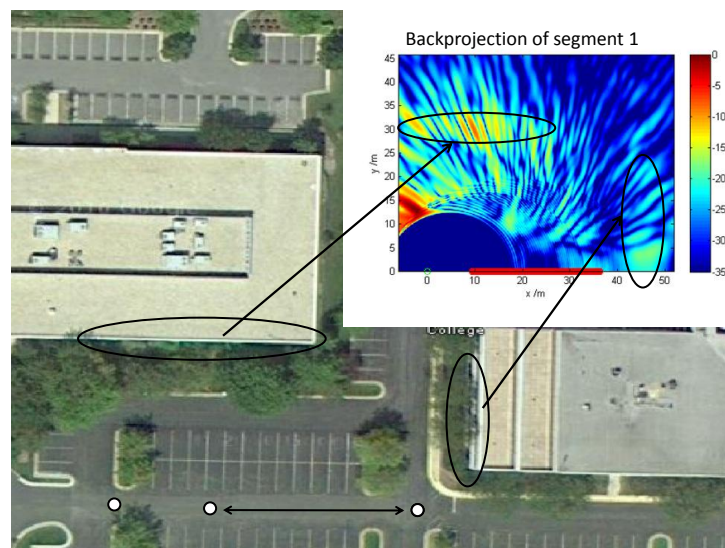


Figure 2. resulting back projection image, and identified scatterers in the image.

Naturally, the image resolution is limited by the bandwidth. We are now performing similar experiments with human intruders, to determine if a human intruder can be detected by forming an image during motion, and detect changes in the image.

1.1.2 Final Demonstration

We are preparing the final demonstration. We will demonstrate wireless synchronization, improved ranging and DF using the synchronized link, and radar imaging using the synchronized link.