

5635: Radar system design

FALL 2013: Class project preliminary report

> Team Names here <

Introduction:

Given the frequent terror encounter missions that occur mainly in the urban areas, it is important to detect and track the human movement in the buildings where there is a face-off between the terrorists and the military group. The detection of human movement by using through the wall imaging (TWI) radar which is capable of locating the moving targets enclosed by a thick concrete wall is indeed very useful to such missions.

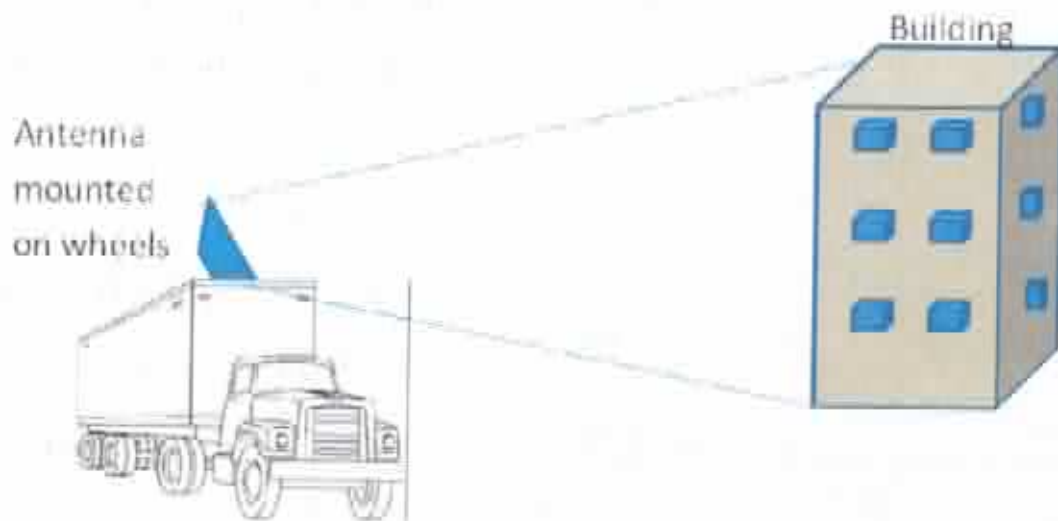


Figure 1: Through the wall imaging radar system

As shown in the figure above, the through-wall radar sensor would be mounted on a vehicle and would operate at close ranges with the ability to detect moving targets within a concrete building structure. TWRI makes use of electromagnetic waves in the S-band to ensure that signals can penetrate through building wall materials. Such a system poses heavy challenges in differentiating the echo signal from the moving target to that from the solid stationary walls. Also given the fact that these imaging systems are mounted on wheels, choosing the appropriate antenna characteristics, transmit power and other radar parameters becomes rather critical.

Good intro