

Course Topics

EEE 598: Remote Sensing and Adaptive Radar

Prerequisites: EEE 554 (or equivalent) - basic knowledge in random signals

Catalog Course Description: Principles and applications of active and passive remote, focusing on methods, performance analysis, and applications of advanced RF geolocation and adaptive radar techniques, including multiple-input multiple-output (MIMO) radar.

Course Topics:

Survey of remote sensing approaches (optical, acoustic, gravimetric, radar)

Introduction to estimation theory (Cramer-Rao bound)

Introduction to detection theory

Antenna array angle of arrival estimation (Beamscan, MVDR, MuSiC)

Time and frequency difference of arrival (TDOA, FDOA)

Radar range equation

Target and clutter models

Radar detection performance

Radar estimation performance

Synthetic aperture radar (SAR)

Ground moving target indicator (GMTI) radar

Space-time adaptive processing (STAP)

Coherent multiple-input multiple-output (MIMO) radar

MIMO GMTI radar

New applications (medical, automotive, low-cost sensors)