

ECE592 Radar and Imaging Techniques

Fall 2020

<https://canvas.uw.edu/courses/1397423/files>

Instructor: Yasuo Kuga, Rm430 ykuga@uw.edu, Office hours: Wed. 9-10pm
Class Schedule: W 6 - 9pm, Zoom meeting
TA: Yannan Liu, Office hours: Saturday 1-3pm
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Objectives:

This course will introduce the different radar target detection and imaging techniques. Students will become familiar with radar cross-section (RCS) measurements techniques.

Prerequisite:

Basic knowledge of electromagnetics (EM), transmission lines (TL) and signal processing. ECE361 level

Course Materials (class web site):

Lecture notes and journal papers

Ref: Microwave Radar and Radiometric Remote Sensing, Ulaby and Long

HW and Lab (tentative):

RCS

Radar reflection models using TL technique and signal processing

RCS calculation and measurement using network analyzer

Polarimetric RCS measurement

AOA (angle of arrival) estimation

SAR(synthetic aperture radar) /ISAR (inverse SAR) processing

Others

No lab in 2020 due to COVID-19

Experimental data will be provided.

Video (tutorial) will be provided.

Tentative Course Topics:

1. Radar equations and radar cross section (RCS) of different targets
2. Polarimetric calibrations and polarimetric imaging of targets
3. Thru-wall and hard-wall radar imaging techniques
4. Detection of angle or arrival (AOA)
5. Inverse Synthetic Aperture Radar (ISAR) and SAR imaging techniques.
6. Weather radar and detection of rain fall
7. Radiometer and applications
8. Passive radars

Grading policy:

Six to seven projects will be assigned. The final grade will be based on the projects/reports. No exam.

**This book is very large and heavy.
Amazon: \$199**

