

ECE 492 – 592: Introduction to Radar Systems**Project**

As the final project for this class, students will utilize one of the commercially available software-defined radar systems available (3-10 GHz UWB Walabot, Infineon 60 GHz FMCW Radar, Texas Instruments 77 GHz AWR 2243 Automotive Radar, or Analog Devices PHASER Radar) to implement and demonstrate a radar application. Students may also choose to do a project involving building a working FMCW Coffee Can Radar (see MIT Open Courseware) or an existing datasets – but please speak with instructor first before proposing such a project.

Project Proposal [20%]

A proposal describing the planned project should be submitted by **Friday, October 17, 2025**. The project proposal comprises 20% of the overall project grade and detail:

1. Project Title
2. Project Team
 - Teams of up to three students are allowed
3. Relevant Skills and Qualifications of each Teammember
 - Major/minor
 - Programming
4. Project Motivation and Scope
5. Project Objectives and Deliverables
6. Feasibility Analysis
 - Mathematical calculations verifying that one of the radar systems provided is capable of accomplishing the planned project
7. Collaboration Plan
 - What the specific tasks and responsibilities of each team member will be
 - Each team member will be graded on the basis of the tasks described here
 - Risk analysis and a backup plan for how the team will respond to potential risks
8. Materials and Supplies Needed
 - Which radars are suitable for your project? Is one specific radar needed and why? Or can multiple radars be suitable? We have a limited number of each type of radar, so based on your response to this question, radars will be assigned to teams.
 - Do you need other materials or supplies for your project? What is the anticipated cost for these materials and the justification for their need? I may be able to offer limited support to enable projects.

Project Report [50%]

The project report is due December 1, 2025.

It should be structured as follows:

1. Motivation and Background
 - a. This section should describe the application
 - b. Why is radar preferred or utilized in this application, what specific advantages or disadvantages is there to use radar
 - c. Summary of relevant literature and current state-of-the-art
2. Summary of Approach
 - a. Project objectives and scope
 - b. Details of algorithms implemented
 - c. Be sure to provide credit for any GitHub resources or AI-based tools utilized.
3. Experiments Conducted
 - a. Description
 - b. Photos of data collection during experiments
4. Results
 - a. Quantitative results showing project works
 - b. Discuss your results – did it work? Why or why not?
5. Appendix providing all code
6. References

Poster Presentation and Demos [30%]

At the end of the semester, a poster session where students will present their work and demo their projects will be conducted. Each team member should present the part of the project that they worked on. The poster session will be divided into two parts so that while half the class is presenting the other half can listen, and vice versa. Students and instructor will ask questions after each presentation. All poster PPT/PDF files should be submitted together with the report.

Poster presentations will be graded based on the following metrics:

1. Presentation quality
 - a. Organization and visuals of the poster
 - b. Oral speaking efficacy
2. Technical accuracy
 - a. Did the student show understanding of their part of the project?
 - b. Did the student show understanding of the project overall?