

# ECE 432 Potential Final Projects

The purpose of the final projects, which are open research projects, is to let you excise what we have learned in class, and more importantly to explore this research field by yourself. The following are some guidelines for final projects, but leaving spaces for your imagination, as they are open-ended research projects. If you are interested in a topic but not sure, please talk to me in advance. Actually, I hope to see many different final projects. So, be creative.

Each project has to be an individual project. No group projects are accepted.

## 1 A Literature Survey Project

Computer vision and pattern recognition is a new and ever-growing research field. Given a quarter, we only cover a subset of research problems and techniques. In our lectures, we went through technical details on some techniques, but were also sketchy on others. Therefore, it is beneficial to you (and the rest of the class) to perform a literature survey (or a tutorial) kind of final project, to cover some interesting topics that are not covered in class. You can choose you own topics. Don't cover too broadly. It is a good idea to focus on a specific research topic.

One requirement is that you need to survey at least 50 technical papers.

## 2 A Technical Project

Many students find it very beneficial to apply computer vision and pattern recognition techniques to their own research problems. I also encourage it. Therefore, another type of final project is a technical project. One can either apply computer vision and pattern recognition to solve a real research problem in your discipline, or one can focus on more in-depth study on any pattern recognition methods themselves.

The requirement is that you need to compare the baseline method and your new method, and analyze their performances. What is valued most is your innovation. Having a new idea and validating it is more important than simply reporting some kind of “good” results.

## 3 Your Talk and Report

Each student should give a short talk in person, a long talk in YouTube video, and submit a **individual** report on the project you've done. It should be at least 20 pages (double space), not including references.

- **The Presentation:** All the presentations will be scheduled at 3/11/2025 and 3/13/2025 during class for a mini-conference. Please bring your own laptop and our classroom has a data projector. Each talk will have 6~ 8 minutes. What you must talk about are:
  1. The goal you want to achieve;
  2. Your approach and your design, or your literature survey;
  3. Your results (showing the result sequences);
  4. How to improve your result if you have one more month.
- **YouTube Presentation:** The short in-class talks are highlights of your projects. You need to have a long talk to give the details of your project. It is a video-based presentation on YouTube.
  1. The deadline of submission of your YouTube link is 3/13/2025 at 9:00am;
  2. The video presentation is 15-20 min long;
  3. The video should include your slides and your face;
- **The Report:** Each student should hand in an **individual** 20-page (at least) report (double-space). The due date is 3/19/2025. Late submissions are not acceptable.

For a survey or tutorial project, you need to write:

- Introduction: what motivates you for this survey?
- Topic and its applications.
- Classification of various methods
- Comparison of these methods
- Conclusion.

For a technical project, you need to write:

- Introduction: what motivates you for this project?
- Problem description.
- Baseline method
- New method and your innovation
- Experiment comparison
- Conclusion
- Course feedback