



# Final Project

Amir Sadovnik  
ECE 574: Computer Vision (Spring 2019)

---

## 1 Overview

The goal of this project is for you to further explore a certain subject that we covered in class or a new subject related to it (based on some previous work). This is an open project in a sense that you will propose the problem you would like to work on and the solution you are planning use. Your main goal should be to explore the characteristics of your problem/solution using the different computer vision techniques we have discussed. This project can be done in pairs.

## 2 A Few Guidelines

1. Your work should be novel in some respect. That is, it should either address a new domain or further examine certain solutions in a specific domain.
2. If you are addressing a new domain it should be different in a substantive way than previous ones (in a way that would make you change the technique).
3. You should not propose a completely new idea. Rather, you should further develop an issue explored in the course or from a paper, or the combination of two issues.
4. Try to find a paper which addresses the topic of your choice, and relate your work to it. The paper does not have to be recent, but you should check to see that your idea has not already been attempted.
5. Try to not introduce multiple novelties - try to focus on one aspect so you can explore it sufficiently.
6. Make sure that the question you bring up in your paper, is answered by your paper.
7. If possible use a public dataset for your project. If you are planning on collecting a new dataset, make sure this is feasible withing the given time.

8. You are encouraged to use project from your own research domain if possible.
9. Since you are running an experiment there is no guarantee that your method will work better than previous ones. Your grade will not depend on the performance, but more on the reasoning behind the method and the presentation of the results.

### 3 Coding

You are required to write your code in python3. You are allowed to use certain external libraries such as Opencv and numpy. If you would like to use any other ones make sure to mention this in the proposal in order to get my approval.

### 4 Implementation Details

1. Your code should accept the image names, window size for the optical flow, and a threshold for the Harris corner detection as command line input.
2. Try to use frames that are  $N$  frames apart, and examine how it effects the results and window size.

### 5 Report

Your report should be similar to the project reports, However, it should be significantly longer given the scope of the project.

1. Introduction - Introduce your problem and hypothesis which you are trying to examine.
2. Previous work review - Mention and briefly describe relevant previous work.
3. Method - Describe the exact method you are planning to use in your paper.
4. A description of your code design and your choice of data structures.
5. Results Analysis - Present the results which answer your hypothesis question. Make sure to carefully describe how your experiments were conducted.
6. Conclusion - What have you achieved in this project? What have you learned?
7. An appendix describing which part of the project each team member was in charge of.
8. References .

## 6 Submission

1. A one page proposal is due on Friday, March 29th.
2. We will have presentation on the week of April 22nd.
3. Final project will be due on Wednesday May 1st. You are required to submit one zip file with both the report and your code.

## 7 Project Examples

1. 2011 Brown University's computer vision: <http://cs.brown.edu/courses/cs143/2011/results/final/>
2. Stanford's Convolutional Neural Networks for Visual Recognition class: <http://cs231n.stanford.edu/project.html>
3. Available datasets: <http://www.cvpapers.com/datasets.html>