

## CS 4670/5670: Computer Vision, Spring 2025

# Project 3: Stereo

### Brief

- Assigned: Friday, March 14th, 2025
- Due: Wednesday, April 9th, 2025 at 11:59PM (turn in via Gradescope)
- Teams: This assignment should be done in a group of 2 students.

### Synopsis

This assignment is meant to exercise concepts of stereo and photometric stereo. There are two parts to this assignment, please complete the TODOs in the following files.

- `stereo.py`
- `photometric_stereo.py`

### Getting Started

#### Python Packages

Please use python3 for this assignment. We recommend creating a [virtual environment](#) and installing all the necessary packages to limit issues with setup.

Make sure you have the following python packages installed:

`numpy, matplotlib, Pillow, scipy`

### Dataset

The link to the datasets is here:

<https://drive.google.com/file/d/1sWY36RUq7eZmSiHbkv8aAs7QGkfKJLhb/view?usp=sharing>

Download and unzip the data folder, and place it in the same directory as your code.

## Part 1 - Stereo:

For this part of the assignment there are 3 functions to complete:

`get_ncc_descriptors`, `compute_ncc_vol`, and `get_disparity`.

Please refer to `stereo.py` for instructions.

## Part 2 - Photometric Stereo:

For this part of the assignment there is 1 function to complete:

`photometric_stereo`. Please refer to `photometric_stereo.py` for instructions.

## Demo:

There are two demo notebooks that you can use to test your implementation of stereo and photometric stereo. These are called `stereo_demo.ipynb` and `photometric_stereo_demo.ipynb` respectively.

We have also provided a version of our notebooks as html files which can be used to compare your implementation with ours. The html notebooks are called ***stereo\_demo.html*** and ***photometric\_stereo\_demo.html***.

## Turn in:

To recap, you must submit:

- `stereo.py`
- `photometric_stereo.py`