Computational Photography (CS 4475 / 6475):

This class explores the impact of computation on the entire workflow of photography, from how light is captured by a camera, to how the images are processed, enhanced, and improved to generate novel photographs. Following is a 15 week syllabus/schedule

* Introduction to Computational Photography (Week 1)
* History of Photography and Computational Photography (Week 1)
* Digital Representation of Images (Week 2)
* Image Processing, Filtering (Week 2)
* Feature Detection and Matching (Week 3)
* Cameras, Optics, and Sensors (Week 4)
* Light, Aperture, and Exposure (Week 5)
* Image Editing and Synthesis (Week 6)
* Image Blending (Week 7)
* Epsilon Photography (Week 7)
* Panoramas (Week 8)
* Photosynth (Week 8)
* High-Dynamic Range Imaging and Half-toning (Week 9)
* Image Mosaics, Montages, Collages (Week 10)
* Computational Cameras (Week 11)
* Coded Photography (Week 11)
* Computational Video (Week 12)
* Video Textures and Video Synthesis (Week 13)
* Image and Video Stabilization (Week 14)
* Plenoptic Imaging and Light Fields (Week 15)
* Projects and Critiques.

Assignments:

This has 5 assignments, of which 4 require some programming and development. 1 requires building a pinhole camera. In addition, there is a critique required, where students identify one artifact of computational photography and present their theories of how it works to the whole class. There also a final project, chosen by the students and several quizzes.

Grading

* Class Attendance & Participation (Online and In Class) (10 %)
* Assignments / Homeworks (undergrads 65 %, grads 55%) [There will be 5 Assignments]
* Final Project (20%)

Includes: Proposal/Teaming(2%), Updates (5%), In class presentation and demo (8%), Final Report and Self Evaluation (5%).

* Portfolio of all Efforts in this class (5%)
* Paper Report (10%).  Find a Research Paper and Present in Class.\*

\*Graduate Students only