CMPT 461 - D100 Comp. Photo. & Image Manip.

**Instructor(s):** Yagiz Aksoy

**Calendar Objective/Description:**
Comp. Photo. & Image Manip.

**Instructor's Objectives:**
Computational Photography is concerned with overcoming the limitations of traditional photography with computation: in optics, sensors, and geometry; and even in composition, style, and human interfaces. The course covers computational techniques to improve the way we process, manipulate, and interact with visual media. The covered topics include image-based lighting and rendering, camera geometry and optics, computational apertures, advanced image filtering operations, high-dynamic range, image blending, texture synthesis and inpainting.

**Prerequisites:**
see go.sfu.ca

**Topics:**
- Imaging basics
- Camera basics
- Fourier transform and sampling
- High dynamic range imaging
- Tone mapping
- Bilateral filtering
- Color
- Image blending
- Boundary minimization techniques
- Focal stacks and light fields
- Transformations and panoramas
- Camera models
- Optical flow
- Deconvolution and noise

**Grading:**
- Programming assignments: 30%
- Final project: 40%
- Presentation: 30%

**Recommended Books:**

**Academic Honesty Statement:**
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).