

CSC320H1S – Introduction to Visual Computing

Winter 2020

Instructor: Yawen Ma

Lectures: LEC5101, LEC2501 Wed. 6–8pm, BA 1170

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Tutorials: TUT5101, LEC2501 Wed. 8–9pm, BA 1170

Office Hours: BA3289, Wed. 5–6pm (or by appointment Wed pm) **Website:** piazza.com/utoronto.ca/winter2020/csc320/home

This course is a beginner-level introduction to computer graphics and computer vision. It is aimed at undergraduates who have an interest in imaging or the visual arts. It will offer a unified treatment of image synthesis and image analysis techniques and will cover three major topics: (1) Principles of Visual Computing: Computational and mathematical methods for creating, capturing, analyzing and manipulating digital photographs. (2) Digital Special Effects: Case studies that examine how visual computing principles were used to create visual effects in movies and commercials. (3) Visual Programming: Programming assignments intended to give hands-on experience with implementing programs for synthesizing and manipulating photographs.

Grading:

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|--------|---|
| 1. 35% | Assignments, A1–A3 (10% each), and A4 (5%) |
| 2. 15% | Project |
| or | |
| 17% | Presentation |
| 3. 50% | One in-class mid-term (Feb. 26, 8pm) (20%) and a final exam (30%) |

Assignments are due at noon on Jan. 29, Feb. 21, Mar. 11 and Mar. 27. Late penalty for assignments is 15% per day for up to five days. See website for hand-outs, for assignment marking policy, and for policies regarding academic honesty. Assignments are for individual by default. Group assignment work of two people is also allowed with auto-fail check: you will have to reach 40 percent on the final to pass this course.

Prerequisites:

1. CSC209 or CSC207
2. One of MAT221, MAT223, MAT240
3. At least one course from L1 below
4. Minimum grades for L1 courses: 77 for MAT136, 73 for MAT137, 67 for MAT157
5. At least one requisite from L2 below

L1: One of MAT136, MAT137, MAT157, MAT235, MAT237, MAT257

L2: At least one Subject POST from ASMAJ1688, ASMAJ1689, ASSPE0108, ASSPE0626, ASSPE0627, ASSPE1007, ASSPE1037, ASSPE1039, ASSPE1688, ASSPE1689, ASSPE1755, ASSPE2175, ASSPE1868

No background in vision, graphics, or image processing will be assumed. Students interested in graphics are encouraged to take CSC320 before taking CSC418. There is very little overlap between CSC320 and CSC418.

Suggested Textbooks/Readings (there is no required textbook):

- K. R. Castleman, Digital Image Processing, Prentice Hall, 1996
- R. Szeliski, Computer Vision: Algorithms and Applications, Springer, 2010[‡]
- J. Minichino, J. Howse, Learning OpenCV3 Computer Vision with Python, 2nd ed, 2015

[†]For help from instructors, please use Piazza to send a private post. For help with the material and assignments, we encourage students to first check the piazza forums, and then to reach out to the instructors/TAs in office hours/tutorials. Please only e-mail instructors for exceptional circumstances.

[‡]Draft of book can be downloaded for free at <http://szeliski.org/Book/>