UTM Campus

# CSC 420: Intro to Image Understanding

*Information Sheet*

## Course Description

This class is an introduction to fundamental concepts in image understanding, the subdiscipline of artificial intelligence that tries to make the computers "see". It will survey a variety of interesting vision problems and techniques. Specifically, the course will cover image formation, features, object and scene recognition and learning, multi-view geometry and video processing. Since Kinect is popular these days, we will also try to squeeze recognition with RGB-D data into the schedule. The goal of the class will be to grasp a number of computer vision problems and understand basic approaches to tackle them for real-world applications.

## Course Information

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| *Semester* | **Winter 2017** |
| *Location* | **DH 2010** |
| *Time* | **Mondays 2pm-4pm** |
| *Tutorial* | **Mondays 4pm-5pm**, **DH 2010** |
| *Webpage* | `http://www.cs.utoronto.ca/~fidler/teaching/2017/CSC420.html` |
| *Online Classroom* | `https://piazza.com/utoronto.ca/winter2017/csc420/home` |
| | This class uses *piazza*. On this webpage, we will post announcements and assignments. The students will also be able to post questions / discussions in a forum style manner, either to their instructors or to their peers. |
| *Textbook* | `http://szeliski.org/Book/` |
| | Richard Szeliski's on-line textbook is a very good resource and is freely available online. We will assign readings from the Sept 3, 2010 version. |
| *Lecture Notes* | Lecture notes and other required readings will be posted on the course website. |

## Instructor

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| *Name* | **Sanja Fidler** |
| *Office* | DH 3094 (UTM), PT 386 (St. George) |
| *Office hours* | Monday, 1pm – 2pm (UTM), or by appointment (St. George) |
| *Webpage* | `http://www.cs.toronto.edu/~fidler/` |
| *E-mail* | fidler@cs.toronto.edu |

## TAs

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| *Name* | **Shenlong Wang** |
| *Webpage* | `http://www.cs.toronto.edu/~slwang/` |
| *E-mail* | slwang@cs.toronto.edu |
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| *Name* | **Hang Chu** |
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| *E-mail* | tchuhang1122@gmail.com |

## Grading

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| *Assignments* | **60% of the grade**<br>There will be **four** assignments, posted every two weeks, starting with the second week. Each assignment will be worth 15% of the grade. They will consist of problem sets and programming problems with the goal of deepening your understanding of the material covered in class. |
| *Project* | **40% of the grade**<br>Each student will be expected to complete a project. The grade will evaluate a project **report** (25% of the grade) and an oral presentation (15% of the grade). In the oral presentation, each student will need to clearly present and be capable to defend his/her work. |

There will be **no** exam.

## Policy

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| *Assignments* | **Individually**<br>The students should **not** discuss the assignments and should solve them **individually**. |
| *Project* | **Individually or in pairs**<br>The project should be done **individually** or in **pairs**. If a project is done in a pair, each student should still hand in his/her own report and defend the project on his/her own. From the report it should be clear what each student has contributed to the project. The course will provide a list of possible projects to choose from. With approval of the instructor, a student will also be able to propose his/her own project. |
| *Deadline* | The solutions to the assignments should be submitted **by 11.59pm on the date they are due**. Anything from 1 minute late to 24 hours will count as one late day. |
| *Lateness* | Each student will be given a total of 3 free late days. This means that one can hand in three of the assignments one day late, or one assignment three days late. It is up to the student to make a good planning of his/her work. After one has used the 3 day budget, the late assignments will not be accepted. |
| *Plagiarism* | We take plagiarism very seriously. Everything you hand in to be marked, namely assignments and projects, must represent your own work. Read how not to plagiarize: `http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize`. |

# Deadlines

The table provides the dates on which assignments will be posted and their due date. The list of available projects will be made available mid February.

| Term Work | Post Date | Due Date |
| --- | --- | --- |
| Assignment 1 | Jan 10 | Jan 17 |
| Assignment 2 | Jan 24 | Jan 31 |
| Assignment 3 | Feb 7 | Feb 14 |
| Assignment 4 | Feb 28 | March 7 |
| Project Report | | April ? |
| Project Presentation | | April ? |

All dates are for 2017. The solutions to the assignments / project should be submitted **by 11.59pm on the date they are due**. Anything from 1 minute late to 24 hours will count as one late day.

# Course Schedule

A **tentative** schedule for this term is as follows:

| Week nb. | Date | Topic |
| --- | --- | --- |
| 1 | Jan 2 | Intro |
| 2 | Jan 9 | Linear filters, edges |
| 3 | Jan 16 | Image features |
| 4 | Jan 23 | Keypoint detection |
| 5 | Jan 30 | Matching |
| 6 | Feb 6 | Segmentation |
| 7 | Feb 13 | Grouping |
| 8 | Feb 20 | Object recognition |
| 9 | Feb 27 | Object detection |
| 10 | March 6 | Object detection, Neural Networks |
| 11 | March 13 | Stereo, multi-view |
| 12 | March 20 | Stereo, multi-view |
| 12 | March 27 | Recognition in 3D |
| 13 | April ? | Project Presentations |