Syllabus
COSC-579-x – Computer Vision – Fall 2017

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Office Hours: Daily hours will be entered on Course Calendar (or by appointment)

TAs: TBD (see Course Calendar for office hours)

Course Description: This course provides a comprehensive introduction to computer vision including image acquisition, low-level vision, and high-level vision. Image acquisition topics may include camera geometry, radiometry, illumination, noise, stereopsis, and affine transformations. Low-level vision topics may include, convolution, Fourier Transform, filters, operators, and feature generation. High-level vision topics may include detection, classification, segmentation, spatial relations, spatio-temporal models, object tracking, deformable models, and graph-based models.

Required Prerequisites: Mathematical Statistics and Linear Algebra

Some existing knowledge of Machine Learning and Image Processing is preferable, but a brief review will be provided.

Required Texts (each available on web):

- Szeliski, Computer Vision: Algorithms and Applications, Springer, 2010
  - http://szeliski.org/Book/
- Prince, Computer Vision: Models, Learning, and Inference, Cambridge, 2012
  - www.computervisionmodels.com
- Goodfellow, Bengio and Courville, Deep Learning, MIT Press, 2016.
  - http://www.deeplearningbook.org
- Nielsen, Neural Networks and Deep Learning, 2015.
  - http://neuralnetworksanddeeplearning.com/

Recommended Readings:

- Horn, Berthold K.P. Robot Vision. The MIT Press, 1986

- Forsyth and Ponce, Computer Vision: A Modern Approach, Prentice Hall, 2011.
- Bishop, Pattern Recognition and Machine Learning, Springer 2006.
- Vapnik, Statistical Learning Theory, Wiley, 2006.
- Duda, Hart, Stork, Pattern Classification, 2nd edition, Wiley, 2000.

Articles:

- **See course website**

Grading:

- Exams (2 total): Total 50% of your grade (25% each). There is no cumulative Final Exam.
- Final Project: 25% of your grade.
- Exercises: Assignments (25%).

Grading Scale:

Grade	*Range*
A	[94,100]
A-	[90,94)
B+	[87,90)
B	[83,87)
B-	[80,83)
C+	[77,80)
C	[73,77)
C-	[70,73)
D	[60,70)
F	[0,60)

Final Project: The final project will be implemented in Matlab or Python (or an agreed upon programming language). Students will implement or extend a state-of-the-art computer vision algorithm and will present their results in-class.

Assignments: Assignments will have theoretical / mathematical portion and coding / applicative portion.

Exams:

- Approximately 1 hour long
- No notes, no outside resources, …

- Make-up exams can be scheduled in extreme circumstances, when notice is provided well in advance of the exam date. ***The format of a make-up exam is to-be-determined and may be oral.***

Attendance and Expectations: Attendance is essential. You will be responsible for everything covered in class. If you need to leave the classroom during a lecture feel free to do so as quietly as possible. Please turn off cell phones or set them to vibrate prior to the start of class. Food and drinks are not allowed in the classrooms.

Academic Honesty: I am required to report any suspicion of academic dishonesty to the Honor Council.

Exams must be entirely your own work. During exams, you are not allowed to view any other students work, show any other student your work, or engage in any discussion. Exams will be closed book and closed notes unless otherwise specified.

All homework assignments must be the result your own effort.

Weekly Class Schedule: It is possible that inclement weather, such as a snow emergency; or some other event could shut down the Georgetown campus. If that happens our class will meet as scheduled using Zoom.

Course topics, administrative guidelines, and other specifics discussed in this syllabus are subject to change. Notice of any changes will be provided in class.