

UNDERGRADUATE ARTIFICIAL INTELLIGENCE SEMINAR

September 27, 2011

4:00 – 6:00 pm: Presentations - BA1180

4:15 – 4:35	Computer Vision	David Fleet, Fernando Flores-Mangas
4:35 – 4:55	Machine Learning	Richard Zemel, Danny Tarlow
4:55 – 5:15	Computational Linguistics	Graeme Hirst, Varada Kolhatkar
5:15 – 5:35	Knowledge & Representation	Fahiem Bacchus, Tyler Lu
5:35 – 5:55	Computational Biology	Michael Brudno, Misko Dzamba

6:00 – 7:30 pm: Reception – BA3200

Talk to graduate students: ask them about their research, courses, grad school. Free food!

(* *Thank you to the organizers: Sven Dickinson, Zoya Gavrilov, Sheila McIlraith, Francois Pitt, Richard Zemel*

Want to get involved in research?

Note: graduate schools look closely at your undergraduate research experience when choosing who to accept. You might want to start looking for research opportunities early on... or perhaps you're just keen on learning something new, seeing what a career in research would be like, and exploring the opportunities out there:

- Apply for a paid summer internship (NSERC USRA) with one of the CS profs – more info: www.cs.toronto.edu/~pgries/usra/usra.html (applications for this year will be out mid-March)
- Not eligible for NSERC? (e.g. International Student), apply for the University of Toronto Excellence Awards (UTEA): applications for this year will be out mid-March, similar to NSERC
- Try some research and get course credit for it (CSC494/495) – find out how by visiting the Computer Science Undergraduate Office (or e-mail: ug@cs.toronto.edu)
- OR e-mail the professor of your choice and ask how you can participate in their research!

Want to learn more?

Liked this seminar, and looking for more like it? There are tons of A.I.-related seminars that take place all throughout the year – you just have to know where to look:

- Distinguished Lecture Series (open to everyone): 11 am, BA 1180 on the following days: Oct. 11, Nov. 15, Feb. 7, Feb. 28, Mar. 6 (check out: <http://web.cs.toronto.edu/Assets/DCS+Digital+Assets/dls2011.pdf>)
- Research in Action Showcase: the CS department showcases its projects at the beginning of April (stay tuned)
- Undergraduate Summer Research Poster Session (August)

Mailing Lists: ask to get added if you want to get e-mails about seminars:

	<i>schedule</i>	<i>who to e-mail, to get added</i>
Machine Learning	thurs (mon) 11:00 am	dtarlow@cs.toronto.edu
Computer Vision	fri 11:00 am	www.cs.toronto.edu/vis/seminars
Computational Linguistics	wed 10:30 am	gh@cs.toronto.edu
Knowledge & Representation	wed 12-2 pm	alexia@cs.toronto.edu
Computational Biology	compbio@cs.toronto.edu	brudno@cs.toronto.edu

Join the Undergraduate Artificial Intelligence Group (UAIG) -> e-mail uoft.uaig@gmail.com

Interested in A.I. courses?

Note: you don't have to be in third or fourth year to take these courses – as long as you have the prerequisites (or can get them waived), you're all set!

CSC320H1 - Introduction to Visual Computing: A unified introduction to image synthesis and image analysis aimed at students with an interest in computer graphics, computer vision or the visual arts. Focus on three major topics: (1) visual computing principles - computational and mathematical methods for creating, capturing, analyzing and manipulating digital photographs (raster algorithms, image acquisition, basic image processing, image warping, anti-aliasing); (2) digital special effects - applying these principles to create special effects found in movies and commercials; (3) visual programming - using C/C++ and OpenGL to create graphical user interfaces for synthesizing and manipulating photographs.

CSC321H1 - Introduction to Neural Networks and Machine Learning: The first half of the course is about supervised learning for regression and classification problems and will include the perceptron learning procedure, backpropagation, and methods for ensuring good generalisation to new data. The second half of the course is about unsupervised learning methods that discover hidden causes and will include K-means, the EM algorithm, Boltzmann machines, and deep belief nets.

CSC384H1 - Introduction to Artificial Intelligence: Theories and algorithms that capture (or approximate) some of the core elements of computational intelligence. Topics include: search; logical representations and reasoning, classical automated planning, representing and reasoning with uncertainty, learning, decision making (planning) under uncertainty. Assignments provide practical experience, both theory and programming, of the core topics.

CSC401H1 - Natural Language Computing: Introduction to techniques involving natural language and speech in applications such as information retrieval, extraction, and filtering; intelligent Web searching; spelling and grammar checking; speech recognition and synthesis; and multi-lingual systems including machine translation. N-grams, POS-tagging, semantic distance metrics, indexing, on-line lexicons and thesauri, markup languages, collections of on-line documents, corpus analysis. PERL and other software.

CSC411H1 - Machine Learning and Data Mining: An introduction to methods for automated learning of relationships on the basis of empirical data. Classification and regression using nearest neighbour methods, decision trees, linear models, and neural networks. Clustering algorithms. Problems of overfitting and of assessing accuracy. Problems with handling large databases.

CSC412H1 - Probabilistic Learning and Reasoning: An introduction to probability as a means of representing and reasoning with uncertain knowledge. Qualitative and quantitative specification of probability distributions using probabilistic graphical models. Algorithms for inference and probabilistic reasoning with graphical models. Statistical approaches and algorithms for learning probability models from empirical data. Applications of these models in artificial intelligence and machine learning.

CSC418H1 - Computer Graphics: Identification and characterization of the objects manipulated in computer graphics, the operations possible on these objects, efficient algorithms to perform these operations, and interfaces to transform one type of object to another. Display devices, display data structures and procedures, graphical input, object modelling, transformations, illumination models, primary and secondary light effects; graphics packages and systems. Students, individually or in teams, implement graphical algorithms or entire graphics systems.

CSC420H1 - Introduction to Image Understanding: Introduction to fundamental concepts in image understanding, the subdiscipline of artificial intelligence dealing with the automation of visual tasks by computer. Exploration of a number of real-world image interpretation problems, as motivation for key low- and intermediate-level vision algorithms. A course project will include the construction of a number of practical vision systems.

CSC485H1 - Computational Linguistics: Computational linguistics and the understanding of language by computer. Possible topics include: augmented context-free grammars; chart parsing, statistical parsing; semantics and semantic interpretation; ambiguity resolution techniques; discourse structure and reference resolution. Emphasis on statistical learning methods for lexical, syntactic and semantic knowledge.

CSC486H1-Knowledge Representation and Reasoning: Representing knowledge symbolically in a form suitable for automated reasoning, and associated reasoning methods: first-order logic, entailment, the resolution method, Horn clauses, procedural representations, production systems, description logics, inheritance networks, defaults and probabilities, tractable reasoning, abductive explanation, the representation of action, planning.

Additional note: you don't have to be a graduate student to take some amazing graduate-level courses. As long as you have the necessary background, you can petition to get into a graduate course (find out how by talking to the Computer Science Undergraduate Office). The graduate-level course descriptions are available here: http://web.cs.toronto.edu/program/gc/2011-2012_Course_Descriptions.htm