Syllabus for LIN 650

Learnability – Spring 2018

Instructor	Course
Jeff Heinz	LIN 650
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N237 SBS	TR 08:30-09:50
L160 IACS	N117 SBS
Office Hours	
TR 2:30-4:00pm and by appointment	
https://heinz-jeffrey.github.io/classes/18S/	

What is this course? Humans learn language, but little is understood about how this happens. There is disagreement about what "learning" means. We study both definitions of learnability and proposals of how natural language patterns can be learned from a computational perspective.

This is the second course in a two semester sequence. The primary focus is directed original research in grammatical inference. In particular, we will study logical characterizations of grammar and methods of learning such logical characterizations.

We will also discuss computational learning theories including, but not necessarily limited to, identification in the limit, active learning, probably approximately correct learning, and statistical learning theory. We will also discuss a range of machine learning techniques including, but not necessarily limited to, grammatical inference, minimum description length, maximizing likelihood, maximizing entropy, Bayesian inference, statistical relational learning, as well as neural networks and deep learning. Throughout the course we address the tension between theoretical, analytical approaches to learning vis a vis benchmarking on specific tasks.

Course Objectives. By the end of this course, students will be able to conduct original computational research on problems related to language learning and acquisition. They will be able to write quality research papers to be submitted for publication.

Course Materials. There is no textbook for the course. I will make readings and notes available online.

Grading. There are two components to final grades: Presentations (30%) and a final paper (70%).

Presentation. Students enrolled for n credits are expected to make n presentations in class during the semester. Presentations can relate to your own research project or other related topics in learning theory and linguistics.

Final paper. Students will write an original research paper in the course of the semester which relates to learning and learnability.

Projects can be theoretical or applied, and most likely will continue the research you began in Fall 2017. Ideally final papers will be of sufficient quality that they could be submitted to venues in computational linguistics such as the ACL, its SIGs, CMCL, and other such places. Two upcoming venues that are a good fit include:

- the 2018 LearnAut workshop: `https://learnaut2018.wordpress.com/`
- the 2018 ICGI conference: `http://icgi2018.pwr.edu.pl/`

The paper is due Friday May 11, 2018.

University Policies and Services

Disability Support Services. If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: `http://www.stonybrook.edu/ehs/fire/disabilities`

Academic Integrity. Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at `http://www.stonybrook.edu/uaa/academicjudiciary/`

Critical Incident Management. Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.