**CSE 6389 Advanced Topics**

Spring 2017

**Instructor(s):** Heng Huang

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**Office Hours:** **Mon 2pm-6:50pm**

**Section Information:** CSE6389

**Time and Place of Class Meetings:** PH 207

**Description of Course Content:** In this course, we will study the cutting-edge advanced research topics in machine learning and data mining by reading and discussing a set of research papers. The main objective of this course is to cover the underlying mathematical concepts and representative algorithms, paper reading, and implementation.

**Student Learning Outcomes:** Understanding the advanced machine learning algorithms, present and discuss newly published ICML, NIPS, KDD papers in classes.

**Required Textbooks and Other Course Materials:** Published ICML, NIPS, KDD papers.

**Descriptions of major assignments and examinations:** CSE6363 is requested.

**Attendance:** The attendance is strongly recommended

**Other Requirements:** A class presentation is required

**Grading**:

|  |  |
| --- | --- |
|  | Based on the class presentations and discussions. |

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wweb.uta.edu/aao/fao/>).

**Disability Accommodations: UT** Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD).** Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities, (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364.

**Counseling and Psychological Services, (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

**Title IX:** *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit*[*uta.edu/eos*](http://www.uta.edu/hr/eos/index.php)*. For information regarding Title IX, visit* [www.uta.edu/titleIX](http://www.uta.edu/titleIX).

**Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents’ Rule* 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University.

**Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

**Student Support Services**:UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to [resources@uta.edu](mailto:resources@uta.edu), or view the information at <http://www.uta.edu/universitycollege/resources/index.php>

## Course Schedule

* Week 1 (Jan. 23):
  + NMF lecture (Hongchang Gao)
* Week 2 (Jan. 30):
  + SVM Optimization (Xiaoqian Wang)
* Week 3 (Feb. 6):
  + The time will be used for paper selection and presentation preparation
* Week 4 (Feb. 13):
  + Deep Learning I (De Wang)
* Week 5 (Feb. 20):
  + Deep Learning II (Kamran Ghasedi)
* Week 6 (Feb. 27):
  + Michail Theofanidis, [Learning Hand-Eye Coordination for Robotic Grasping with Deep Learning and Large-Scale Data Collection](https://people.eecs.berkeley.edu/%7Esvlevine/papers/grasp_iser.pdf)
  + Michail Theofanidis, [Deep networks for motor control functions](http://journal.frontiersin.org/article/10.3389/fncom.2015.00032/full)
* Week 7 (Mar. 6):
  + Ashwin Ramesh Babu, [Matrix Completion with Queries](http://cs-people.bu.edu/natalir/papers/kdd2015.pdf)
  + Zhifei Deng, [Scaling Distributed Machine Learning with the Parameter Server](http://www.cs.cmu.edu/%7Emuli/file/parameter_server_osdi14.pdf)
* Week 8 (Mar. 13):
  + Spring Break
* Week 9 (Mar. 20):
  + Jianjin Deng, [Efficient Mini-batch Training for Stochastic Optimization](http://www.cs.cmu.edu/%7Emuli/file/minibatch_sgd.pdf)
  + Qicheng Wang, [Pegasos: Primal Estimated sub-GrAdient SOlver for SVM](http://ttic.uchicago.edu/%7Enati/Publications/PegasosMPB.pdf)
* Week 10 (Mar. 27):
  + Ashwin RameshBabu
  + Xin Miao, [Generative Adversarial Nets](http://papers.nips.cc/paper/5423-generative-adversarial-nets.pdf)
  + Lin Yan, [Two-Manifold Problems with Applications to Nonlinear System Identification](http://www.cc.gatech.edu/%7Ebboots3/files/twoManifold.pdf)
* Week 11 (Apr. 3):
  + Sanika Gupta, [Online Instrumental Variable Regression with Applications to Online Linear System Identification](http://www.cc.gatech.edu/%7Ebboots3/files/OIVR_AAAI.pdf)
  + Zhifei Deng, [Stochastic Dual Coordinate Ascent with Adaptive Probabilities](http://jmlr.org/proceedings/papers/v37/csiba15.pdf)
* Week 12 (Apr. 10):
  + Sanika Gupta, [Deep Visual Analogy-Making](http://papers.nips.cc/paper/5845-deep-visual-analogy-making.pdf)
  + Xin Miao, [Fast and Robust Parallel SGD Matrix Factorization](http://dm.postech.ac.kr/MLGF-MF/fp352.pdf)
  + Lin Yan, [Scalable Machine Learning Approaches for Neighborhood Classification Using Very High Resolution Remote Sensing Imagery](https://www.cise.ufl.edu/%7Eanand/pdf/KDD15_cameraready.pdf)
* Week 13 (Apr. 17):
  + Jianjin Deng
  + Qicheng Wang, [Stochastic Optimization with Importance Sampling for Regularized Loss Minimization](http://jmlr.org/proceedings/papers/v37/zhaoa15.pdf)
* Week 14 (Apr. 24):
  + Rodrigo Linhares, [Action-Conditional Video Prediction using Deep Networks in Atari Games](http://papers.nips.cc/paper/5859-action-conditional-video-prediction-using-deep-networks-in-atari-games.pdf)
  + Rodrigo Linhares, [Multiview Triplet Embedding: Learning Attributes in Multiple Maps](http://jmlr.org/proceedings/papers/v37/amid15.pdf)
* Week 15 (May 1):
  + Shirin Shirvani, [GraphChi: Large-Scale Graph computation on Just a PC](http://www.select.cs.cmu.edu/publications/paperdir/osdi2012-kyrola-blelloch-guestrin.pdf)
  + Shirin Shirvani, [Collaborative Deep Learning for Recommender Systems](http://arxiv.org/pdf/1409.2944v2.pdf)

“*As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Heng Huang.”*

**Emergency Phone Numbers**: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.

For non-emergencies, contact the UTA PD at 817-272-3381.

Library Home Page <http://www.uta.edu/library>

Subject Guides <http://libguides.uta.edu>

Subject Librarians <http://www.uta.edu/library/help/subject-librarians.php>

Course Reserves <http://pulse.uta.edu/vwebv/enterCourseReserve.do>

Library Tutorials <http://www.uta.edu/library/help/tutorials.php>

Connecting from Off- Campus <http://libguides.uta.edu/offcampus>

Ask A Librarian [http://ask.uta.edu](http://ask.uta.edu/)

The subject librarian for your area can work with you to build a customized course page to support your class if you wish. For examples, visit <http://libguides.uta.edu/os> and <http://libguides.uta.edu/pols2311fm> .