

EE 379K (16720)
Data Science Laboratory

Instructors:

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TAs:

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Office hours: Mondays 1 - 2 pm, Thursdays 2 - 3 pm, EER 6.820

Lectures: T.Th. 12:30-2:00 in ECJ 1.214

Six lab sections. Five in EER 0.818, and one in EER 1.512. Sign up for one section.

The emerging field of data analytics and, more broadly data science, is transforming engineering, healthcare, scientific discovery and many industries ranging from Agriculture to Telecommunications. In this class we are going to discuss how to use data to build models to perform prediction and inference. Topics: Predictive modeling. Regression and Classification. Data cleaning and preprocessing. Feature engineering. Unsupervised methods. Principal Component Analysis. Data clustering. Model selection and feature selection. Entropy and Information theory. Neural Networks and Deep Learning. Machine learning for signals and time-series data.

Requirements: The class will have a significant hands-on component on working with real data, performing modeling and prediction. Laptops with wifi access, Python, Numpy, Pandas and Scikit installed are required. Additional tools will be discussed when introduced.

Course Material:

Online resources will be posted on Canvas, and also on the course web page:

<http://users.ece.utexas.edu/~dimakis/DataScienceLab.html>

Additionally we recommend:

ISL Book: An Introduction to Statistical Modeling (G. James et al.),

And other materials we will refer to in each class as needed.

Grading:

- Labs reports and Quizzes: 35%
- Midterm Kaggle, 20% One week towards the end of February (TBD)
- In-class midterm: 15% -- Thursday, April 5th
- Final Project: 30%. Teams of 4.
 - The project includes a report and presentation
 - 40% of the project grade will be from the presentation. These will take place in the last one or two class days, but in the evening to allow for more time, and for pizza. Plan for 5-8 pm in Room TBA.
 - 60% of the project grade will be from the report.
 - Project proposal -- who's on your team, what you want to do and with which data set(s) you plan to use. Due Date: Tuesday, April 10th
- There will be no final exam.

Class Policy Rules

1. If you got a very low grade in the diagnostic quiz you must refresh this material again and consider if you are well prepared for this class.
2. This is a very large class. Unfortunately, we cannot modify pre-requisite requirements on a student by student basis.
3. In each lecture you are required to bring a laptop or another device you use to take canvas quizzes with. *In each lecture we may ask you to take an in-class canvas quiz.*
4. Lab reports will be completed in teams of 2. Teams should be in the same lab section.
5. Late homeworks and lab reports: You can be late up to 2 hours. After that, no late homeworks and lab reports will be accepted.
6. Sign up for one lab section. Each lab section has a specific number of seats. You must have a partner in the same lab section for the lab reports.
7. Attending your lab section is not mandatory. You have to obviously turn in your lab report to get graded. Do not attend another lab section since each lab room has a specific number of seats.
8. Write all FULL names and UT EIDs on each lab report and project report.
9. Discussion of homework and lab reports is encouraged. Please be absolutely sure to submit your own solutions that you type yourself.
10. When submitting a lab report or a project report on canvas, EVERY participating student in that report should upload the materials on canvas, not only one of them.
11. Your project report submission will be a blog post. If you have large data sets, don't worry – we will help find the resources to help you post this. For some examples, of past projects, you can see some reports are here:
<http://users.ece.utexas.edu/~dimakis/DataScienceLab.html> see 'Some Final Projects from Spring 2017'.

12. Do not leave cloud-running instances on if you are not using them. You will lose your credits quickly.

University Honor Code

"The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community."

College of Engineering Drop/Add Policy

The Dean must approve adding or dropping courses after the fourth class day of the semester.

Students with Disabilities

UT provides upon request appropriate academic accommodations for qualified students with disabilities. Please contact the Office of Dean of Students at 471-6259 or ssd@uts.cc.utexas.edu.

Emergency Preparedness

Every member of the university community must take appropriate and deliberate action when an emergency strikes a building, a portion of the campus, or entire campus community. Emergency preparedness means we are all ready to act for our own safety and the safety of others during a crisis.

Students requiring assistance in evacuation must inform the instructor in writing of their needs during the first week of class. This information must then be provided to the Fire Prevention Services office by fax (512-232-2759), with "Attn. Mr. Roosevelt Easley" written in the subject line.

You may want to bookmark the emergency Web site <http://www.utexas.edu/emergency/> because it is updated with information during actual emergencies or campus closures.

The university collects cell phone numbers from members of the campus community for emergency text messages. You can sign up for campus text alerts online. If you would like more information regarding emergency preparedness, visit

<http://www.utexas.edu/safety/preparedness>