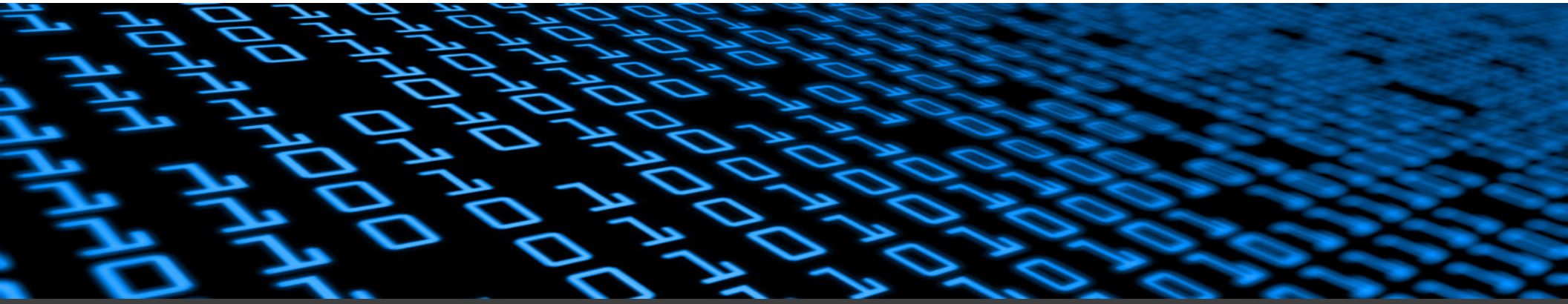

CS 6316

Machine Learning

INTRODUCTION ~ Fall 2017

Prof. Nada Basit

Lecture

- Mondays and Wednesdays
- 3:30 – 4:45pm
- Thornton E303

Contact

- Prof. Nada Basit
- Office: Rice Hall, room 405
- Email: basit@Virginia.edu (best way to get in touch!)
  - Please include "CS 6316" in email subject header!
- Office hours:
  - Tuesdays: 1:00-3:00pm
  - Wednesdays: 11:30-12:30pm
  - Other times: Available by appointment only

  These times may change – if so, an announcement will be sent out

  --- Office Hour Challenge! ---

Teaching Assistants

- Still being finalized…
- TA information as well as office hours will be announced on the "Home" tab of our Collab page

What do you think Machine Learning is?

What's it All About? Main Goal?

- Advances in computer and database technology motivate the need for estimating dependences (models) from available data.
- Often the main goal is to estimate a model providing *generalization*, i.e. good prediction for future (unseen) data.
- Such methods have been traditionally explored in such diverse fields as: Statistics (multivariate regression and classification), Engineering (pattern recognition, system identification), and Computer Science (artificial intelligence, machine learning, data mining.)

What's it All About? Main Goal?

- This course presents description of predictive data-analytic modeling methods on several different levels:
  - Conceptual/mathematical
    - fundamental concepts / principles
  - Technical
    - learning methods and applications
  - Philosophical ("philosophy of science"
    - judging the validity (*truthfulness*) of scientific theories

Textbook

- *Predictive Learning*, V. Cherkassky, 2013
- Available at UVA bookstore (soon, if not already there)
- Chapter 1 of this textbook is available on Collab Resources

- Additional reading
  - Will be posted
    - e.g. *The problems of Philosophy*, B. Russell
  - Encouraged to read from many sources

Course Topics – High Level

- Introduction
- Brief Probability Review (incl. Bayesian Decision Theory
- Basic Learning Approaches: Concepts and Theory
- Philosophical Perspectives
- Statistical Learning Theory and Learning Methods
- Classification and Regression
- Support Vector Machines
- Connectionism and Neural Networks
- Brief introduction to Deep Learning

Assessment

- Homework Assignments – 45%
- Written Assignments – 15%
- Project – 20%
- Exam – 20%

Any Questions or Concerns at this Time?