CS534, Fall 2019
Course logistics

Course Information

- Instructor: Dr. Xiaoli Fern

  Kelley 3073, xfern@oregonstate.edu
- TAs:
  - Taylor Dinkins dinkinst@oregonstate.edu
  - Zoe Juozapaitis jragonmiris@gmail.com
- Office hour (held in Kelly unless otherwise stated)
  - Instructor: Tu Th after class 1:50 -2:30 (in class, then transiting to Kec 3073)
  - TAs: TBD, will be published on canvas
- Class Web Page – canvas access
- Class email list

  cs534-f19@engr.orst.edu

Course Materials

- Materials (links available on canvas syllabus page)
  - A Course in Machine Learning by Hal Daume III, online recourse, easy to follow
  - Mathematics for Machine Learning by Marc Peter Deisenroth, A Aldo Faisal, and Cheng Soon Ong
    - Nice intro to math foundations (Part I) with example ML algorithms (Part II)
  - *Pattern recognition and machine learning* (PRML) by Chris Bishop, much denser, not recommended for beginners
  - Machine learning by Tom Mitchell, somewhat outdated but nice reference for basic concepts

- Slides and readings will be provided on course webpage

- Online resources on machine learning
  - Check class website for links

Prerequisites

- Basic probability theory and statistics concepts: Distributions, Densities, Conditional probabilities, product rule and chain rule of probability, Expectation, Variance …
- Basic calculus, multivariate calculus: take derivatives (univariate and multivariate functions) …
- Linear algebra: vector space, matrices, norm, dot product …
- Optimization: gradient-based approach, convex/non-convex functions, constrained optimization, Lagrange multiplier …
- Knowledge of basic CS concepts such as data structure, search strategies, complexity

Please spend some time review these! Especially probability and linear algebra. It will be tremendously helpful!

Homework and late policy

- Assignments: written and implementation
- Written Assignments (10% of the grade):
  - Individual assignments, analytical and conceptual questions
    - Help toward understanding the inner working of the algorithms
    - Useful if you want to design/derive novel algorithms
    - Help toward the exams
  - Due to the size of the class, each assignment only a subset of problems will be graded based on correctness. Others will be based on completeness.
- Implementation assignments. Group assignment of up to 3 students
  - Implement learned algorithms on simulated or real data
  - Perform experiments and report and analyze results
  - Answer questions regarding experiments as well as conceptual questions.
- Late policy: Late submissions are allowed up to 48 hours past the deadline. Submitted with 24h, get 90%, submitted with 48, get 75%.

Final Grade composition

- Final grades breakdown:
  - Midterm 25%;
  - Final 25%;
  - Written Homeworks 10%;
  - Implementation 30%;
  - Participation 10% (in class problem solving);

The schedule about assignments and exams will be posted by the end of this week

How to get most out of this class?

- Make sure you are comfortable with the pre-requisite math concepts
  - They will make machine learning concepts a lot easier
  - Resources posted on canvas
- Attend the class and participate in problem solving sessions
  - Lecture notes will be posted at the beginning of the week. I would recommend students to go over the slides ahead of time and come to class with questions. This will make the lecture a lot more useful
  - Do not be afraid to ask questions both in class and off-line.
- Find the right people for group partner
  - Make arrangement early on – use class email list or canvas discussion board to seek potential partners
  - Set up regular meetup schedules for the team to work together throughout the term
  - Establish expectations for how your group will work together early on