Introduction to Machine Learning
CSE474/574: Course Introduction

Varun Chandola <chandola@buffalo.edu>

26 Jan 2015

Class Details
Syllabus
Textbooks
Grading
Gradiance
Python
Socrative Online
Honor Code
Checklist and Resources

Outline

1. Class Details

2. Syllabus

3. Textbooks

4. Grading

5. Gradiance

6. Python

7. Socrative Online

8. Honor Code

9. Checklist and Resources

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Class Details

- Lecture Information
  - Monday, Wednesday, Friday (9.00 - 9.50 AM)
  - 121 Cooke Hall
- **Recitations** - Undergraduates Only
  1. 3.00 - 3.50 PM Monday, *Norton 209*
  2. 8.00 - 8.50 AM Friday, *Davis 113A*
- Recitation sessions will be announced on Monday lectures
  - No recitation this week.
- Class web page
  - http://www.cse.buffalo.edu/~chandola/teaching/machinelearning.html
  - https://piazza.com/buffalo/spring2015/cse574cse474/home

Instructor

- Varun Chandola
  - http://www.cse.buffalo.edu/~chandola
  - Email: chandola@buffalo.edu
  - Office: 113K Davis Hall
  - Phone: (716) 645-4747
- Office Hours: 10.15 AM - 12.15 Noon (Mondays)

Teaching Assistants

- Dangyang Chen
    - Email: dangyangc@buffalo.edu
    - Office Hours: Thursdays 3.00 PM - 4.00 PM (Davis 302)
- Radhakrishna Dasari
    - Email: radhakri@buffalo.edu
    - Office Hours: Fridays 10.00 AM - 10.50 AM (Davis 302)
- Jialiang Jiang
    - Email: jjiang6@buffalo.edu
    - Office Hours: Thursdays 11.00 AM - 12.00 PM (Davis 302)

Piazza

- Primary medium of communication
- All announcements, teaching notes, slides, polls, etc. will be made available through Piazza.
- Questions?
  1. General post to all (*Name will be visible*).
     - Choose appropriate folder.
  2. Private post to instructor, TA.
- Interact.

Piazza Incentive

- Top 3 contributors (questions *or* answers) will get recognized
- Award - *To be decided*

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Topics Covered

Theoretical Machine Learning

- Concept Learning
- Mistake Bound Online Learning
- Vapnik-Chervonenkis Dimension
- PAC Learning
- Statistical Learning Theory

Machine Learning Tools

- Bayesian Inference
- Expectation Maximization
- Optimization

Machine Learning Algorithms

- Linear Regression
- Linear Classification
- Neural Networks
- Support Vector Machines
- Kernel Methods
- Latent Space Models (PCA)
- Mixture of Models
- Bayesian Networks

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Textbooks

- No prescribed text
- Primary references
- Optional reading list
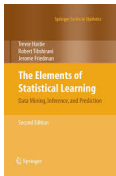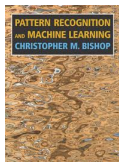
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Grading

- Grading Scheme
    - Short weekly quizzes using Gradiance (12) – 30%
    - Programming Assignmentss (3) – 30%
    - Homeworks (1) – 10%
    - Final Exam (in-class, open book/notes) on 05/13/2014 – 30%
- All components will be individually curved

- Final grade:

A	$[92.5, 100]$	B-	$[72.5, 77.5)$
A-	$[87.5, 92.5)$	C+	$[67.5, 72.5)$
B+	$[82.5, 87.5)$	C	$[62.5, 67.5)$
B	$[77.5, 82.5)$	C-	$[57.5, 62.5)$

- Use **UBLearns** for **all** electronic submissions

Grading for Undergraduates

- Top 10 Gradiance quiz scores will be considered
- Undergraduate homework will have one less problem
- Same final exam and programming assignments
- Undergraduate students **can only partner with** other undergraduate students

Final Exam

- Material covered in Gradiance quizzes (and maybe homeworks and programming assignments)
- All multi-choice objective problems
- No partial credit

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Gradiance

- An online quiz system
- One quiz per week released on Monday by 8.59 AM and due next Sunday by 11.59 PM
- 3 - 4 multiple choice problems about topics covered that week
- A warm up quiz (ungraded) is posted
- 5-minute delay between successive submissions
- Only 3 tries allowed, maximum score will be used

Gradiance Enrollment

- Go to http://www.newgradiance.com/services
- Register and use the class token **425B9733**
- **Make sure you register using the username posted to you by the instructor**

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Python

- All programming assigments and class demonstrations using Python
- Resources:
  - Installing python, ipython
  - More about ipython notebooks
  - Python for Developers, a complete book on Python programming by Ricardo Duarte
  - An introduction to machine learning with Python and scikit-learn (repo and overview) by Hannes Schulz and Andreas Mueller

Github Repo

- `https://github.com/ubdsgroup/ubmlcourse`
- `http://nbviewer.ipython.org/github/ubdsgroup/ubmlcourse/tree/master/notebooks/`

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Socrative Online

- Online student response system
    - Random number generator!
- http://m.socrative.com/student/
- Enter class ID - 259432
- Optional

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Academic Integrity and Honor Code

- http://www.cse.buffalo.edu/shared/policies/academic.php

Machine Learning Honor Code

- Against the ML honor code to:
  1. Collaborate on Gradiance quizzes
  2. Collaborate or cheat during Final Exam
  3. Submit someone else's work, **including from the internet**, as one's own for any submission
  4. Misuse Piazza forum
- You are allowed to:
  1. Have discussions about homeworks. Every student should submit own homework with names of students in the discussion group explicitly mentioned.
  2. Collaborate in groups of 2 or 3 for programming assignments. One submission is required for each group.
- Violation of ML honor code and departmental policy will result in an automatic F for the concerned submission
- Two violations $\Rightarrow$ fail grade in the course

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1. Sign-up for Piazza
2. Sign-up for Gradiance, try warm-up quiz
3. Read the department's academic integrity policy

Resources

- Piazza - piazza.com/buffalo/spring2015/cse574cse474/home
- Youtube Channel -
  www.youtube.com/channel/UCaTscKv-pyj4ypU2KG3OMDg
- Course slides and handouts -
  www.cse.buffalo.edu/~chandola/machinelearning.html
- Github Repo - github.com/ubdsgroup/ubmlcourse
- Notebooks - nbviewer.ipython.org/github/ubdsgroup/
  ubmlcourse/tree/master/