CS 822 (Fall 2013): Machine Learning

Course Information

- Instructor: Shuiwang Ji
- Office: ECSB 3325
- E-mail: sji@cs.odu.edu
- Lecture: Tuesday, 4:20-7:00PM
- Office Hours: Tuesday, 3:20-4:20PM or by appointment
- Lecture Location: ECSB 2120
- Class Homepage: [http://www.cs.odu.edu/~sji/classes/ml-2013f/](http://www.cs.odu.edu/~sji/classes/ml-2013f/)
- Textbooks: (the textbooks will not be followed closely)

Prerequisites

Knowledge of multivariate calculus and linear algebra is required, and some familiarity with probabilities would be helpful though not essential.

Grading

- Class participation and interaction (5%)
- Assignments: 5 assignments accounting for 30%
- Exams: 2 exams accounting for 30% (each 15%)
- Project: a semester-long project accounting for 35%
Final letter grades will be assigned based on absolute percentage as follows:

- [100, 95]: A
- (95, 90]: A-
- (90, 87]: B+
- (87, 84]: B
- (84, 80]: B-
- (80, 75]: C+
- (75, 72]: C
- (72, 69]: C-
- (69, 0]: F

where [ ] denotes inclusion and ( ) denotes exclusion. The instructor reserves the right to move the thresholds down based on the distribution of final percentages, but they will not move up.

**Make-Up Tests and Late Assignments**

You are expected to submit all assignments on the due date. **Hard-copy is due before class on the due date, and code in electronic copy (if required) is due at the end of the due date.** You cannot be assigned a grade unless you submit the homework/project.

For late assignments, 10% is deducted for each day (including weekend) late for the first week after an assignment is due. An assignment submitted beyond a week will not be accepted. If you cannot attend an examination at its scheduled time, you should contact the instructor prior to the examination with doctor’s notes.

**Class Schedule (Subject to Change)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>Basics of probability and linear algebra</td>
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<tr>
<td>3</td>
<td>Dimensionality reduction, PCA, SVD, LSI</td>
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<td>4</td>
<td>K-means, hierarchical, and spectral clustering</td>
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<td>5</td>
<td>Generative models and Naive Bayes</td>
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<td>6</td>
<td>Discriminative models and logistic regression</td>
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<td>7</td>
<td>Linear models for regression and sparsity learning</td>
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<td>8</td>
<td>Support vector machines and kernel methods</td>
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<td>9</td>
<td>Deep learning and neural networks</td>
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<tr>
<td>10</td>
<td>Decision tree and ensemble learning</td>
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Academic Honesty

All assignments are strictly individual and must be your own work. The instructor reserves the right to question a student orally or in writing and to use his evaluation of the student’s understanding of the assignment and of the submitted solution as evidence of cheating. Violations will be reported to the Honor Council for consideration for punitive action. By CS Dept. policy, students found to be in violation of this rule will, at the very least, receive a failing grade in the course and may be subject to stiffer penalties.

Honor Code

All students are expected to abide by the ODU Honor Code. This means that all exams and assignments are to be the exclusive work of the student. An honor pledge will be required on all work which is to be graded.