9.520/6.860: Statistical Learning Theory and Applications

• Class: Tue, **Thu 11:00 - 12:30 pm**, 46-3002 (Singleton)
  Office Hours: Friday 1:00 pm - 2:00 pm, 46-5156 (Poggio lab lounge)
  and/or 46-5165 (MIBR Reading Room)


• Contact: [9.520@mit.edu](mailto:9.520@mit.edu)

• Mailing list: [9.520students@mit.edu](mailto:9.520students@mit.edu)

• Live Stream: CBMM Youtube channel

• 9.520/6.860 will use Stellar
• Also check web (announcements) for updates
Material

Slides— will be posted (for most lectures) on the website

Videos— check CBMM

Notes—

L. Rosasco and T. Poggio, Machine Learning: a Regularization Approach, MIT-9.520 Lectures Notes, Manuscript, (will be provided)

For feedback on book (typos, errors, ...)
https://goo.gl/forms/pQcewnsAV3ICNoyr1
Faces

Instructors:
Faces

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  • Lorenzo Rosasco
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  • Sasha Rakhlin
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  • Qianli Liao
  • Morteza Sarafyazd
  • Abhimanyu Dubey
<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Title</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0</td>
<td>Thu Sep 05</td>
<td>The Course at a Glance</td>
<td>TP</td>
</tr>
<tr>
<td>Class 1</td>
<td>Tue Sep 10</td>
<td>Statistical Learning Setting</td>
<td>LR</td>
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<tr>
<td>Class 2</td>
<td>Thu Sep 12</td>
<td>Regularized Least Squares</td>
<td>LR</td>
</tr>
<tr>
<td>Class 3</td>
<td>Tue Sep 17</td>
<td>Features and Kernels</td>
<td>LR</td>
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<tr>
<td>Class 4</td>
<td>Thu Sep 19</td>
<td>Logistic Regression and Support Vector Machines</td>
<td>LR</td>
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<td>Class 5</td>
<td>Tue Sep 24</td>
<td>Learning with Stochastic Gradients</td>
<td>LR</td>
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<tr>
<td>Class 6</td>
<td>Thu Sep 26</td>
<td>Implicit Regularization</td>
<td>LR</td>
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<tr>
<td>Class 7</td>
<td>Tue Oct 01</td>
<td>Large Scale Learning by Sketching</td>
<td>LR</td>
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<td>Class 8</td>
<td>Thu Oct 03</td>
<td>Sparsity Based Regularization</td>
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<tr>
<td>Class 9</td>
<td>Tue Oct 08</td>
<td>Neural networks: Introduction, backpropagation</td>
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<tr>
<td>Class 10</td>
<td>Thu Oct 10</td>
<td>Convolutional Neural Networks</td>
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<td>Tue Oct 15</td>
<td>Columbus Day</td>
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<td>Class 11</td>
<td>Thu Oct 17</td>
<td>Statistical Learning I</td>
<td>AR</td>
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<tr>
<td>Class 12</td>
<td>Tue Oct 22</td>
<td>Statistical Learning II</td>
<td>AR</td>
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<tr>
<td>Class 13</td>
<td>Thu Oct 24</td>
<td>ERM, Uniform Convergence</td>
<td>AR</td>
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<tr>
<td>Class 14</td>
<td>Tue Oct 29</td>
<td>Sample Complexity via Rademacher Averages</td>
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<tr>
<td>Class 15</td>
<td>Thu Oct 31</td>
<td>Margin Analysis for Classification</td>
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<td>Class 16</td>
<td>Tue Nov 05</td>
<td>Local Methods</td>
<td>AR</td>
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<tr>
<td>Class 17</td>
<td>Thu Nov 07</td>
<td>Sample-Compression, Stability</td>
<td>AR</td>
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<td>Class 18</td>
<td>Tue Nov 12</td>
<td>Privacy and Information-Theoretic Stability</td>
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<td>Class 19</td>
<td>Thu Nov 14</td>
<td>Online Prediction</td>
<td>AR</td>
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<tr>
<td>Class 20</td>
<td>Tue Nov 19</td>
<td>Sample complexity of Neural Networks</td>
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<td>Class 21</td>
<td>Thu Nov 21</td>
<td>Guest lecture</td>
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<td>Class 22</td>
<td>Tue Nov 26</td>
<td>Guest lecture</td>
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<td></td>
<td>Thu Nov 28</td>
<td>Thanksgiving</td>
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<td>Class 23</td>
<td>Tue Dec 03</td>
<td>Deep Learning Theory: Approximation</td>
<td>TP</td>
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<td>Class 24</td>
<td>Thu Dec 05</td>
<td>Deep Learning Theory: Optimization</td>
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<td>Class 25</td>
<td>Tue Dec 10</td>
<td>Deep Learning Theory: Generalization</td>
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<td>Class 26</td>
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<td>Wed Dec 11</td>
<td>Project reports due</td>
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Grading policies

Problem sets (0.6)
- 4 problem sets (0.15 each)
  - 2 - 3 questions (exercises and/or MATLAB)
  - 1 week due
- Late policy on next slide
- typeset in LaTeX (template will be provided)
- Online submission by due date

Project (0.3)
- See later

Participation (0.1)
- *Attending class lectures is required!*
- Sign-in sheet will be circulated on random lectures
Problem sets

- Problem sets (0.6)
  - 4 problem sets (0.15 each)
    - 2 - 3 questions (demonstrations/exercises + short MATLAB)
    - 7 days due!
  - typeset in LaTeX (template provided)
  - online submission by due date

- Late policy
  - All students have 4 free late days (to be used on psets and project proposal)
  - You may use up to 2 late days per assignment with no penalty
  - Beyond this, we will deduct a late penalty of 50% of the grade per additional late day

- Dates (due times are 11:59 pm). Submission online (on Stellar).
  - Problem Set 1, out: Sep. 19, due: Wed., Sep. 25 (Class 07).
  - Problem Set 3, out: Oct. 31, due: Wed., Nov. 06 (Class 18).
  - Problem Set 4, out: Nov. 14, due: Wed., Nov. 20 (Class 21).

- Collaboration policy: You may discuss with others but need to work out your own solution.
This is not a data science course, so we will not consider data preparation as contributing to the grade.

report (NIPS format): 5 pages + references

Dates
• Abstract and title: Nov. 1
• Feedback and approval: Nov. 8
• Report submission: Dec. 11