

# MCS 548 – Mathematical Theory of Artificial Intelligence

## Fall 2014

### Projects and Presentations

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## 1 Project idea

By 3pm on 11/7/14, email me a proposed project idea and the names of the collaborators working together. Additionally, write a paragraph or so describing what problem you will be attempting. Your project is subject to my approval. I expect you will spend at least  $37.5 \frac{n+1}{2n+1}$  hours per person on this project, where  $n$  is the number of people working together *who are registered for the class*.<sup>1</sup> I only need to receive one email per group.

The project must be an *attempt* to solve any open problem in learning theory. Places to look for problems include recent proceedings from conferences. Specifically, open problems or directions from any paper from COLT or ALT; the learning papers in STOC, FOCS, ITCS or SODA; or the theory-oriented papers from ICML, NIPS, or AISTATS should be suitable. If you need guidance picking a project, please email me.

Your project grade will (eventually) be based on demonstrated effort and the quality of the final write-up.

## 2 Presentations

Presentations of papers for this class will be during the days 11/20, 11/25, and 12/2. Please list the presentation dates by order of preference, and email me this ordering by 11/14, *together with your choice of paper to present* (the paper choice will be subject to my approval). I will assign presentation slots in the order I receive requests. Presentations are to be related to your project choice and must be done individually. Students working in groups will present *different* papers (related to the same project), and their presentation grade will be assigned based only on their own presentation.

Presentations will be done on the white-board and will begin strictly on-time. Presentations on 11/20 and 11/25 will be 20 minutes each, and the presentations on 12/2 will be 25 minutes each. 5 minutes will be allotted for questions. You must have a deeper understanding of the paper than you are able to present, and this will be elucidated in the question period. Many of the possible papers are complicated, so you will not be able to present them in full, or even in much detail. Some papers are so difficult that you may not be able to understand them fully, and that is okay too – the more difficult the paper, the more leeway you will have. Nonetheless, your goal will be to 1) clearly explain the problem being solved, 2) explain the state of the art before the paper, 3) explain what advance the paper made, 4) in as much detail as time allows, give an overview of how the result was obtained, and 5) be prepared to answer questions from your audience. You will not be responsible for knowing any advances that were made after the appearance of the paper you are presenting

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<sup>1</sup>Students auditing the class may also participate in doing the projects.