CMPUT 654
Online learning

Csaba Szepesvári
University of Alberta
Plan for today

- Introduction/admin
- Expectations
- Requirements
- Course outline
- Games
Schedule!

- **Time:** MWF 12:00-12:50
- **Room:** CSC B41

Change??

- **Time:** TR, Afternoon any time
- **Room:** CSC B43
Office hours

- appointment: Csaba.Szepesvari@ualberta.ca
- stop by
- Room: Ath331
- Phone: x2-8581
Information sources

- Course web page:

- Book
Expectations
Theory vs. Practice

“He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.”

Leonardo da Vinci
Questions, questions...

- “The outcome of any serious research can only be to make two questions grow where only one grew before.”
  Thorstein Veblen

- “"Obvious" is the most dangerous word in mathematics.”
  Eric Temple Bell
Understanding

- There are no deep theorems -- only theorems that we have not understood very well.

Goodman, Nicholas P.
Practice

“\textit{In mathematics you don’t understand things. You just get used to them.}”

John von Neumann
Requirements, grading

3 options for grading

1. Regular assignments (50%), final oral exam (50%)
2. Solve any of the assignments rated as difficult (100%)
3. Regular assignments (50%), project work (50%)

see pdf
Course outline

- Online learning: minimize loss while learning compared to baseline: Regret
- Results under statistical assumptions
  - Bandits: Gittins, UCB
- No statistical assumptions:
  - sequence prediction with expert advice
  - convex (parameter) optimization
  - bandits: exploration/exploitation tradeoff
  - reactive opponents
  - pattern recognition
  - linear classification
Time for the games!

1. Mindreader:  
   [http://seed.ucsd.edu/~mindreader/index.html](http://seed.ucsd.edu/~mindreader/index.html)

2. Dowry problem:  