# 6.883 Final Project Proposal: Mind-Reading Machine++

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**Overview**

In the 1950's, as described in lecture 1 of class, David Hagelbarger and Claude Shannon built the first "mind reading" machines to play the game of matching pennies [1, 2]. Rumor has it that Shannon's bot beat Hagelbarger's 55 to 45. A modern version of a "mind reading" machine (`http://www.mindreaderpro.appspot.com`) was produced by Professor Yoav Freund and his colleagues at UC Berkeley. Professor Freund's machine uses hedging algorithms and context-weighted trees.

In this project, I will produce my own "mind reading" machine that explores using expert's advice, as described on `http://www.mindreaderpro.appspot.com/about` as future work.

In short, I would like to:

1. Familiarize myself with the relevant past and current work [1, 2, 3, 4] on predicting sequences of bits
2. Implement various 'experts' and combine them into a single predictor
3. Compare my implementation against those of Hagelbarger, Shannon, and Freund.

**References**

[1] David W Hagelbarger. Seer, a sequence extrapolating robot. *Electronic Computers, IRE Transactions on*, 1:1–7, 1956.

[2] Claude E Shannon. A mind-reading machine. *Bell Laboratories memorandum*, 1953.

[3] Frans M. J. Willems, Yuri M. Shtarkov, and Tjalling J. Tjalkens. The context tree weighting method: Basic properties. *IEEE Transactions on Information Theory*, 41:653–664, 1995.

[4] Nicolò Cesa-Bianchi, Yoav Freund, David Haussler, David P. Helmbold, Robert E. Schapire, and Manfred K. Warmuth. How to use expert advice. *J. ACM*, 44(3):427–485, May 1997.