**Prediction of a Chess Endgame**

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**Project Description:**

We would like to propose a third approach: formulate the problem of deciding the result of a chess position as a classification problem. Toward this end we will implement and test a variety of classification algorithms for our data set, and attempt to justify the performance of our algorithms by comparing the mathematical theory behind each of them to the peculiarities of our problem. We would also like to see how these algorithms perform on reparameterizations of our data (for example, it may be that the exact location of each piece is more information than we need, and that the Manhattan distances between the pieces can tell us just as much about the true class label), and we would like to try simpler class label spaces (e.g. use 2 class labels instead of 18: either a position is won for white or it's drawn). Finally, we will comment on the feasibility of using classification as a technique for deciding the result of positions with more than 3 pieces.

**Reference:**

<http://archive.ics.uci.edu/ml/datasets/Chess+%28King-Rook+vs.+King%29>

**Time Line:**

May 4th 🡪 Proposal Due

May 23rd 🡪 Midterm Report Due

May 30th 🡪 Final Presentation

June 8th 🡪 Final Report Due

**Responsibilities:**

Mike: TBD

Adam: TBD

Greg: TBD

**Milestones:**

1. Project Kickoff
   1. Understand our Problem & Objectives
   2. Summarize Relevant Research Papers
   3. Decide on what method(s) we will use
2. Modeling
   1. Create formal Math Notation for our problem
   2. Write down derivations
   3. Create update function
   4. Write down algorithm in Math Terms
3. Simulation
   1. Create MATLAB Work Directory (with \*.mat files)
   2. Create Training code
   3. Create Evaluation code
   4. Tune
4. Midterm Report
   1. Write up
   2. Create supporting figures/graphs
5. Presentation
   1. Write up
   2. Create supporting figures/graphs
   3. Practice
6. Final Report
   1. Write up
   2. More figures/graphs
   3. Polish