

Deep Learning and Computer Chess

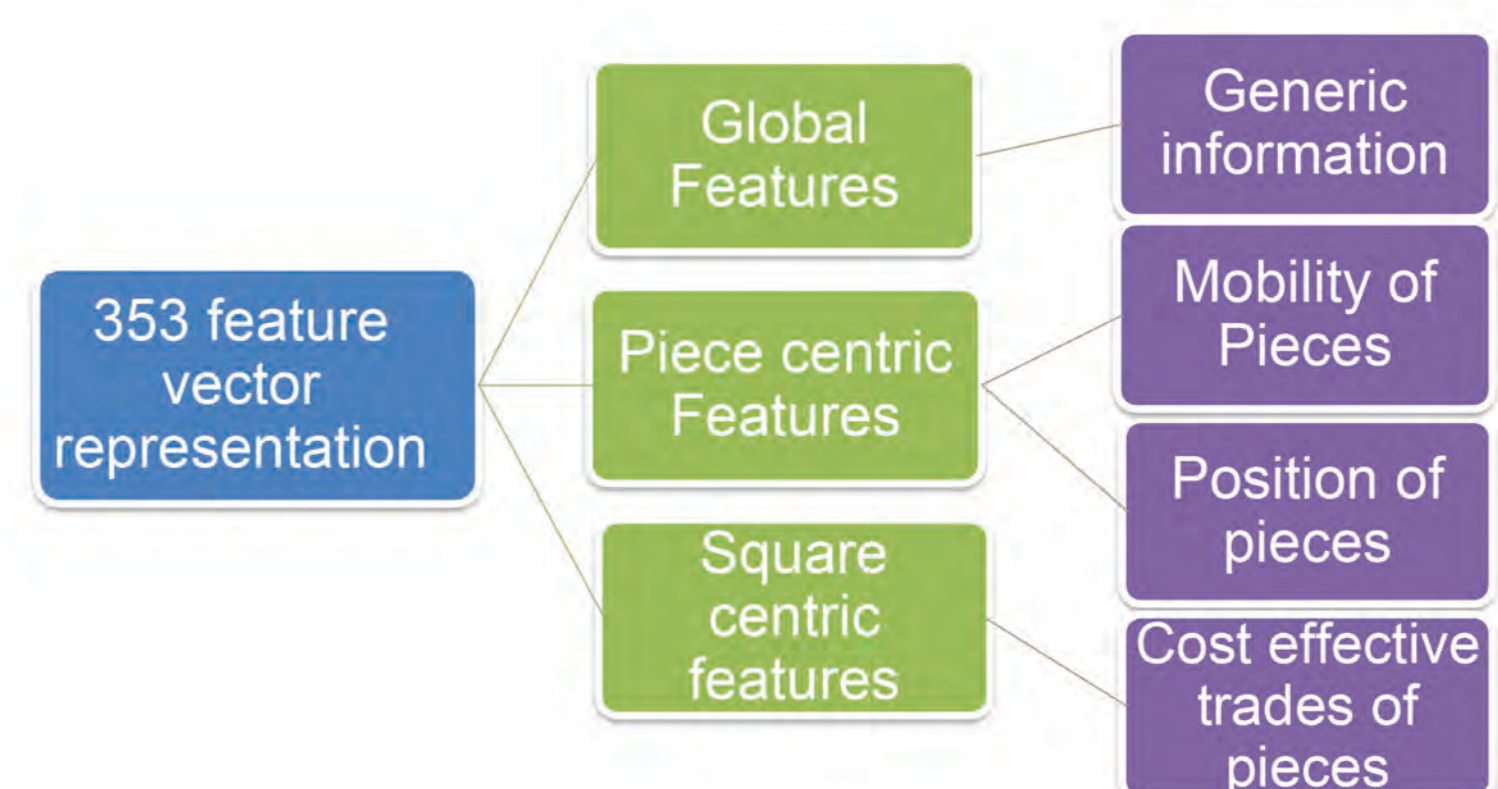
A deep learning based chess engine

Student: Ng Zhen Wei

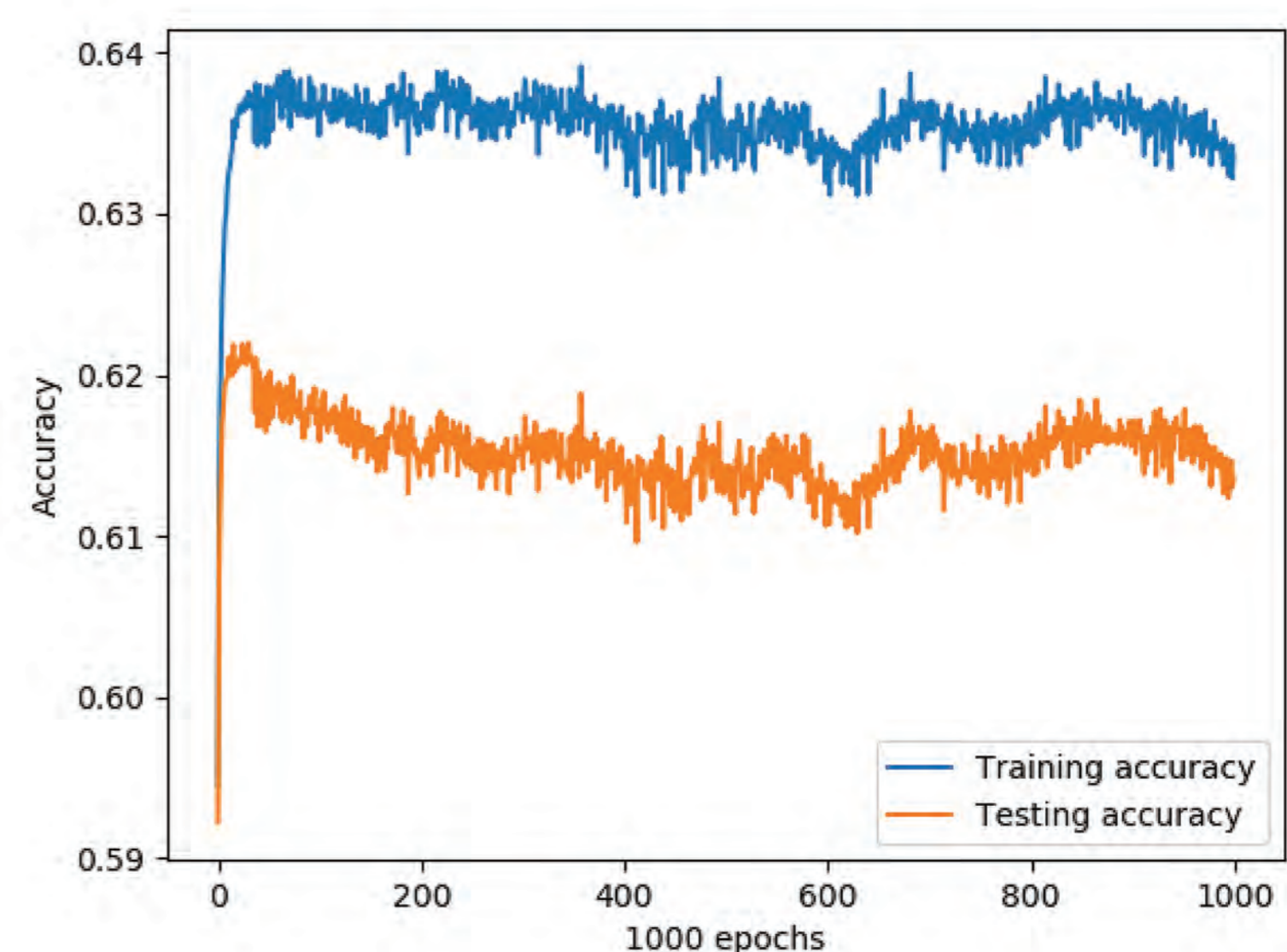
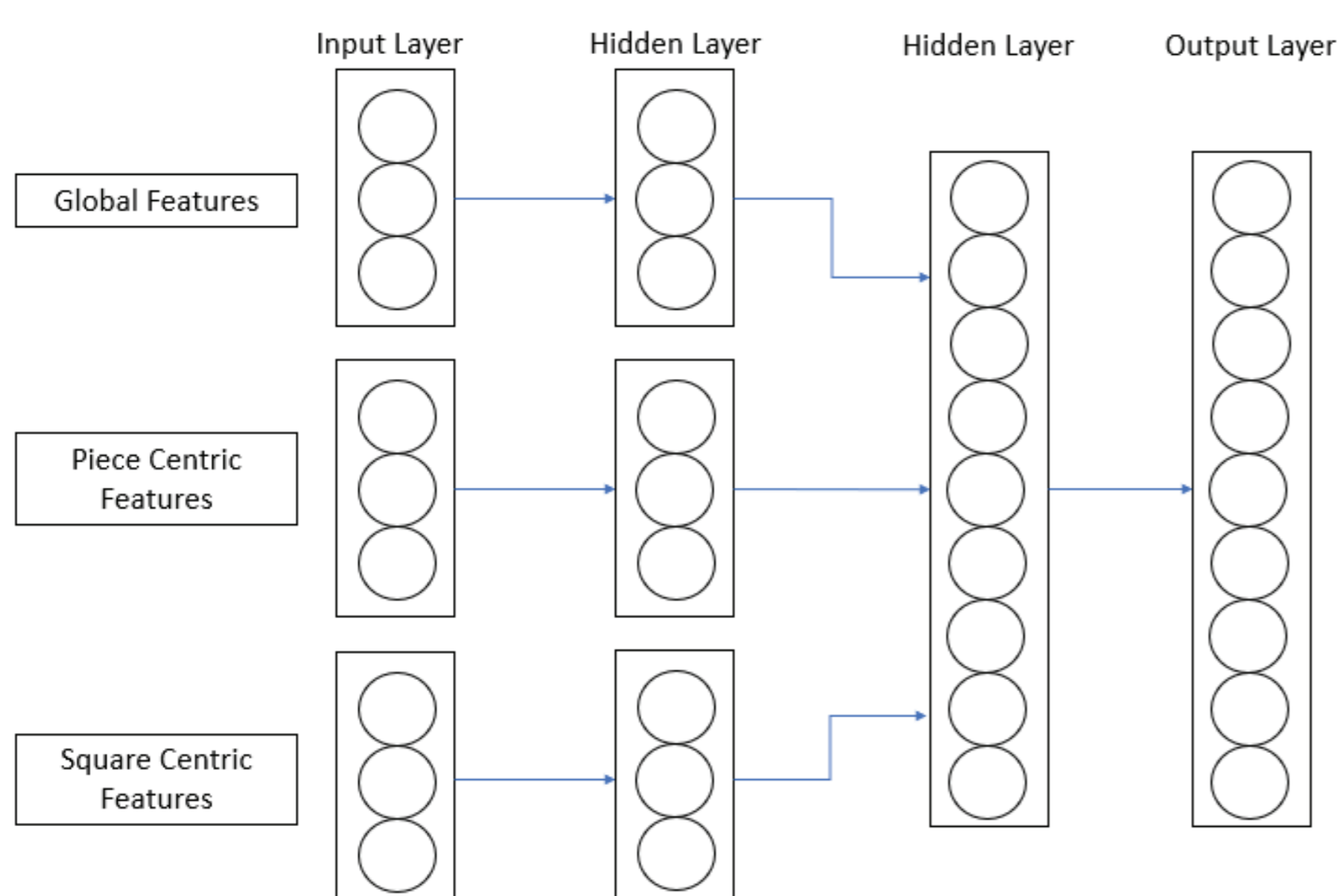
Supervisor: Assoc Prof He Ying

Chess has been around since the 15th century. Players have relied on tactics and skills to play and compete in Chess games and tournaments. Today, digitization has brought Chess playing to computers along with the development of Chess engines. There are different types of chess engines such as the minimax search based chess engine and the neural network based chess engine. This project focuses on the evaluation function using a deep learning and neural network based approach.

Feature extraction was performed to extract 353 features which were classified into 9 labels. These labels represent the state of the current board. Using supervised learning, a 3 layered deep neural network was developed as an evaluation function to evaluate the state of the board.



Label	0	1	2	3	4	5	6	7	8
Board Status	White is winning	White has decisive advantage	White is much better	White is better	Even	Black is better	Black is much better	Black has decisive advantage	Black is winning



The neural network was able to develop an evaluation function which produces a test accuracy of 0.6. It is highly possible that the feature representations were restricting the learning of the neural network. An end to end model could possibly be implemented in the future whereby the neural network takes in the FEN record as input and automatically figure out the features of its encoder.