# CS3211 Project 2: OthelloX

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# 1 Introduction

## 1.1 Problem Description

Generating best moves given a board positions for the game of Othello / Reversi.

## 1.2 Terminologies

1. Depth: move taken by a player

## 1.3 Minimax algorithm

## 1.4 Evaluation functions

1. An Evaluation Function for Othello Based on Statistics
2. Evaluation Techniques Wikipedia
3. Temporal Difference (TD) based evaluation function for Othello
4. Multi-ProbCut and New Evaluation Function

1. Complexity
2. Limitations

# 2 Data Structures & Algorithms

## 2.1 Storage Techniques

## 2.2 Search algorithm

1. Best-First Minimax Search
2. Searching for Solutions in Games and Intelligence

### 2.3 Techniques to improve serialized components

### 2.4 Techniques to improve parallelization

1. Shared Hash Table
2. Distributed Alpha-Beta Search with Eldest Son Right
3. Lazy SMP
4. Parallel Alpha-Beta
5. Principal Variation Search
6. Dynamic Tree Splitting (DTS)
7. Parallel Mont-carlo tree search
8. Parallel General Game Player

## 3 Tabulation of data

### 3.1 Testing scalability of the algorithms

Scaling is measured using change in nodes per second (NPS). Speedup is measured using change in time to depth.

1. Depth of the search 2 - 8
2. Size of board 6x6, 8x10, ..., 26x26

## 4 Discussion