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DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
Spring 2024
CT-361
Artificial Intelligence & Expert System
Section B

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CT-22060
Batch 2022

Video link
https://drive.google.com/file/d/11sAnmJDFiGgL5-IheAk8xQlwOfnXdsQY/view?usp=sharing

Comparison of Minimax and Alpha-Beta Pruning

In this experiment, we compared the performance of the **Minimax** algorithm and its optimized version with **Alpha-Beta Pruning** for solving Tic-Tac-Toe.

- **Minimax Algorithm** evaluates all possible moves in the game tree, leading to a high computational cost as it explores every possible outcome.

- **Alpha-Beta Pruning** optimizes Minimax by pruning branches of the game tree that won't influence the final decision, significantly reducing the number of nodes evaluated.

Benchmarking Results:

- **Minimax Time**: 6.38 seconds

- **Alpha-Beta Pruning Time**: 0.25 seconds

Conclusion:

Alpha-Beta Pruning is 6.13 seconds faster than Minimax, demonstrating a significant improvement in efficiency. By eliminating unnecessary calculations, Alpha-Beta Pruning optimizes the search process, making it much faster without sacrificing the optimality of the decision-making.