

Comparing Human and Automated Agents in a Coordinated Navigation Domain

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Introduction

- Crowdsourcing lets us harness workers online to do tasks
- Can they play a game together if they can't communicate or plan?
- Are they better than Artificial Intelligence (AI)?

Methods

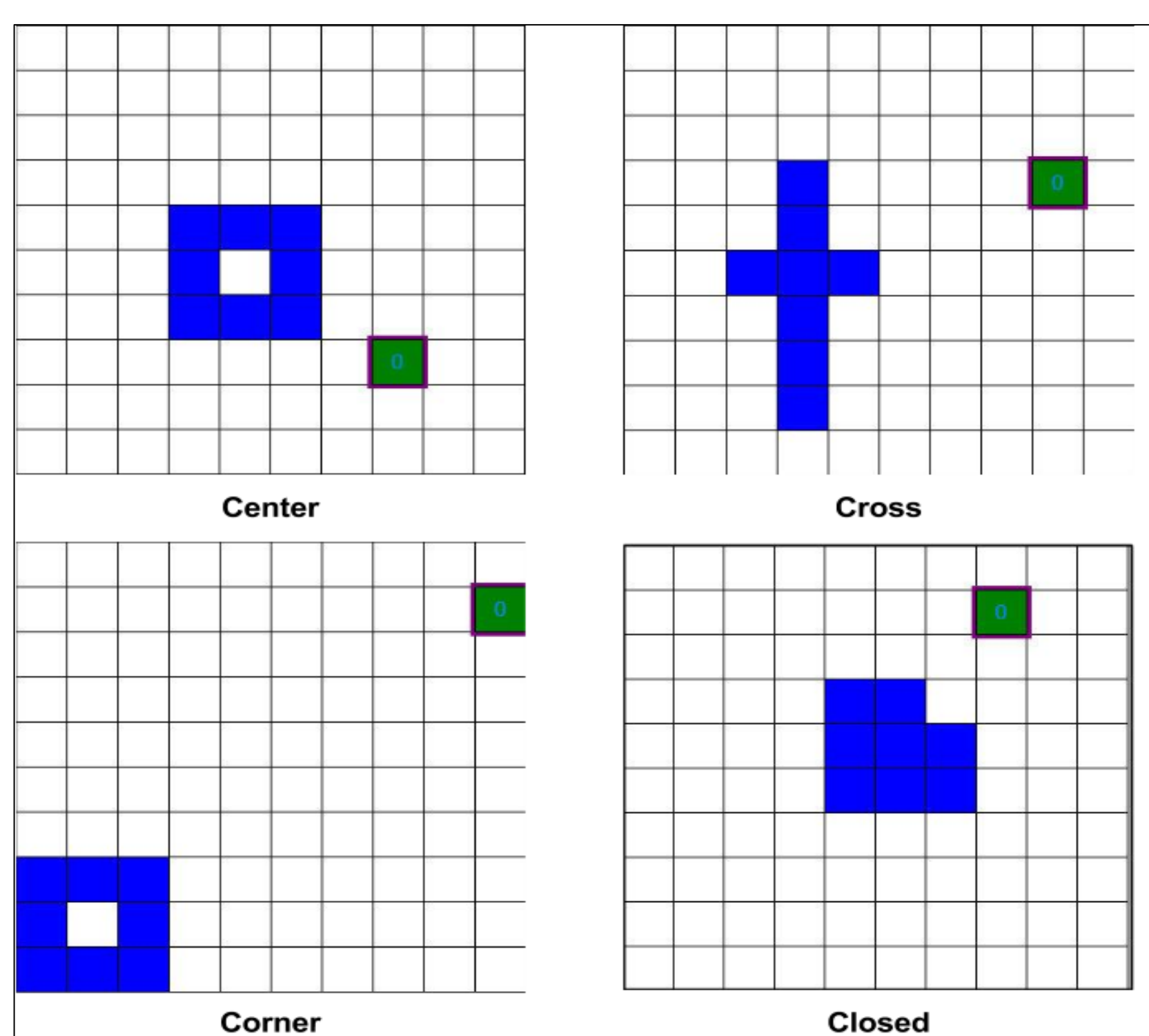
- Recruited players from Amazon's Mechanical Turk
- Players had to form the shape on the map with their pieces
- Time and move optimality (moves needed vs. moves taken) were measured

Conclusions

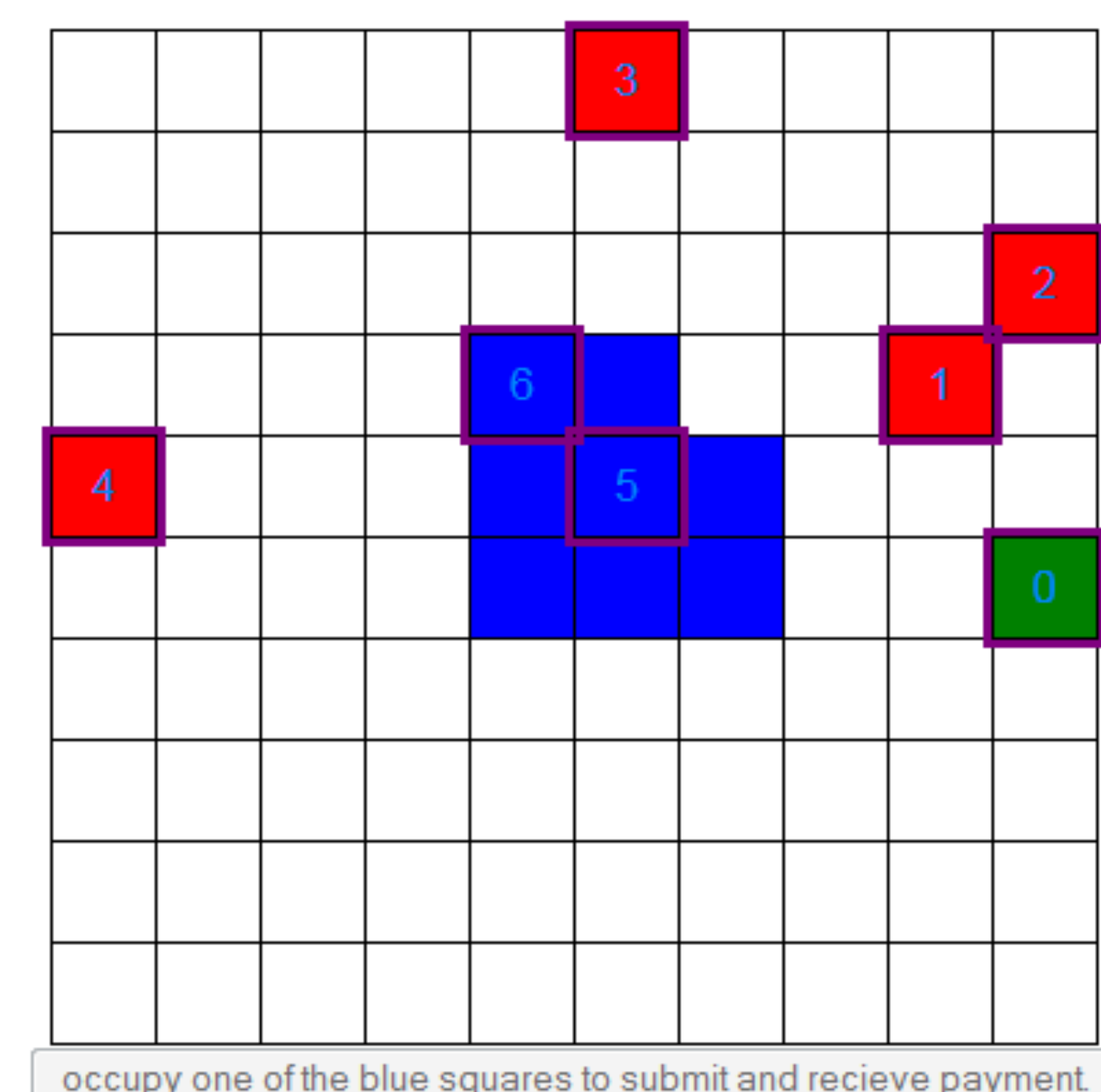
- Humans performed much slower than AI
- Humans had similar optimality to AI
- Slower movement may come from **slow learning** players (users who took much longer to play the game than normal)

Shape Tester Domain

- Similar to Pursuit Domain
- Players move to blue spots to complete a shape
- Simulates predators "cornering" a prey



The four shapes used in the Shape Tester game.



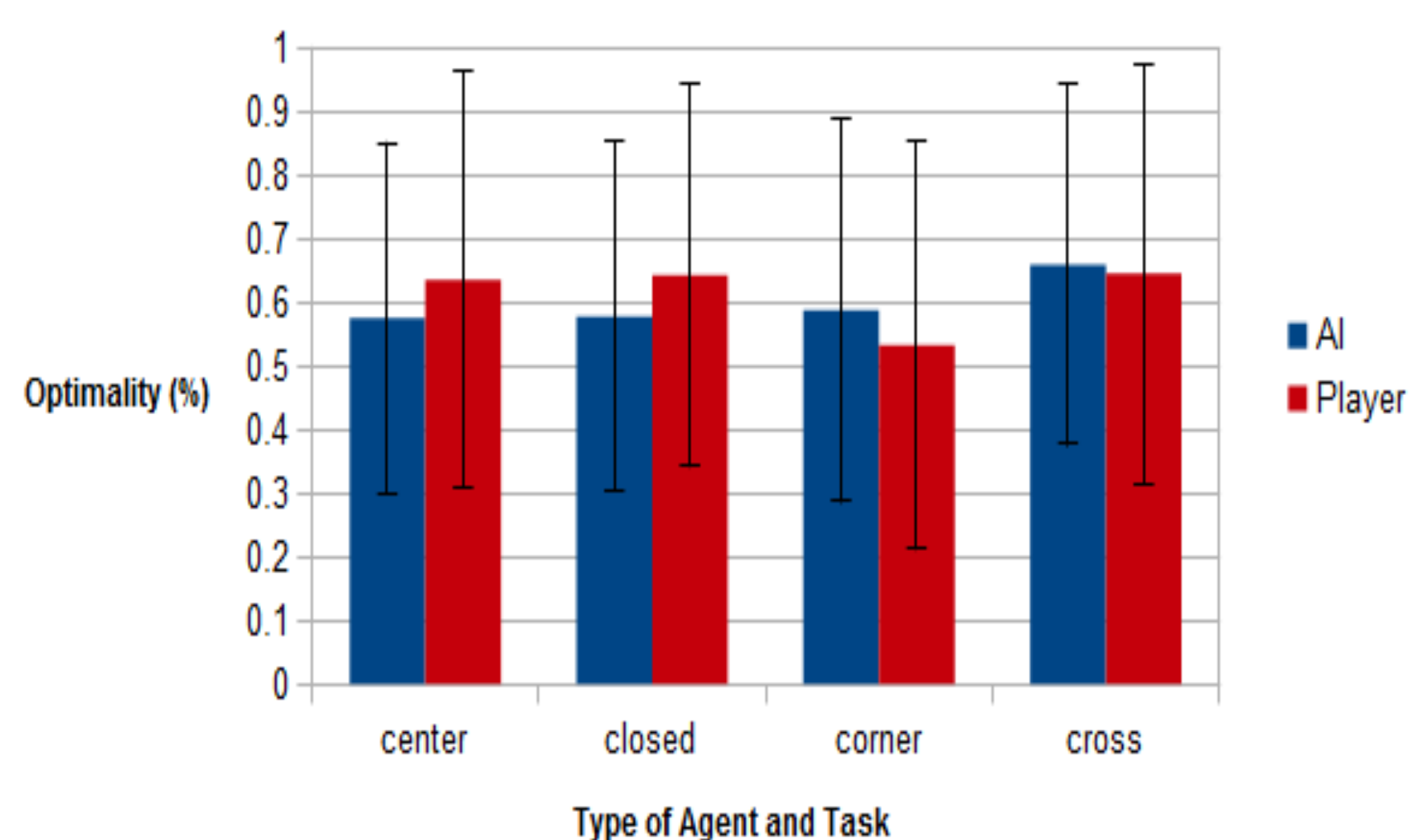
An example of the ShapeTester board mid-game from the perspective of player 0.

Results

Move Optimality

- AI and human agents performed with comparable optimality

Average Optimality vs Type of Agent and Task

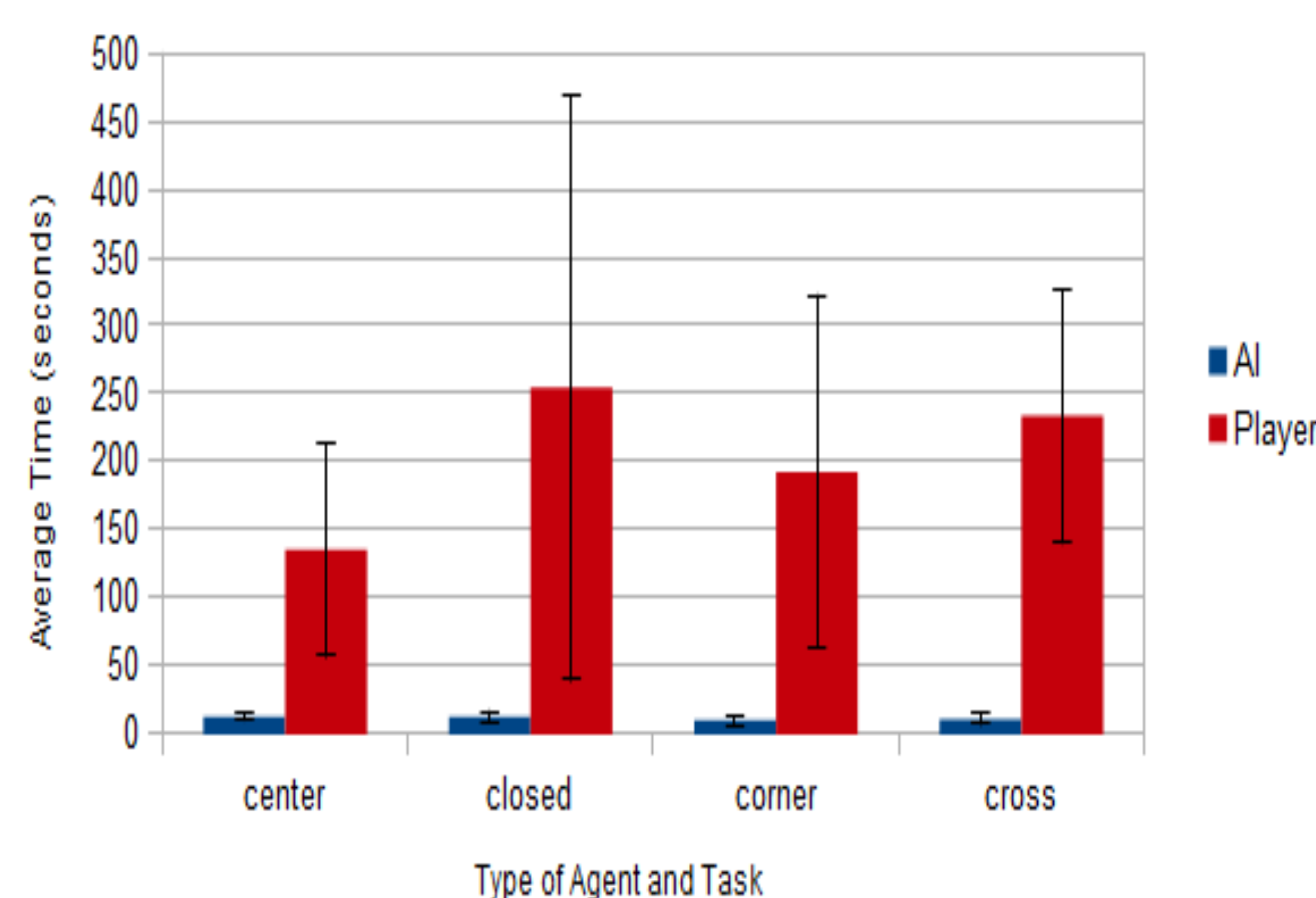


Human and AI agents have similar move optimality across all tests.

Time to Completion

- AI finished the ShapeTester game faster than humans in all cases.

Average Time vs Type of Agent and Task



Human agents showed more variation in the time needed to complete the task, but still took much longer than AI.

References

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2. Barrett, S.; Stone, P.; Kraus, S.; and Rosenfeld, A. 2013. Teamwork with limited knowledge of teammates.
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