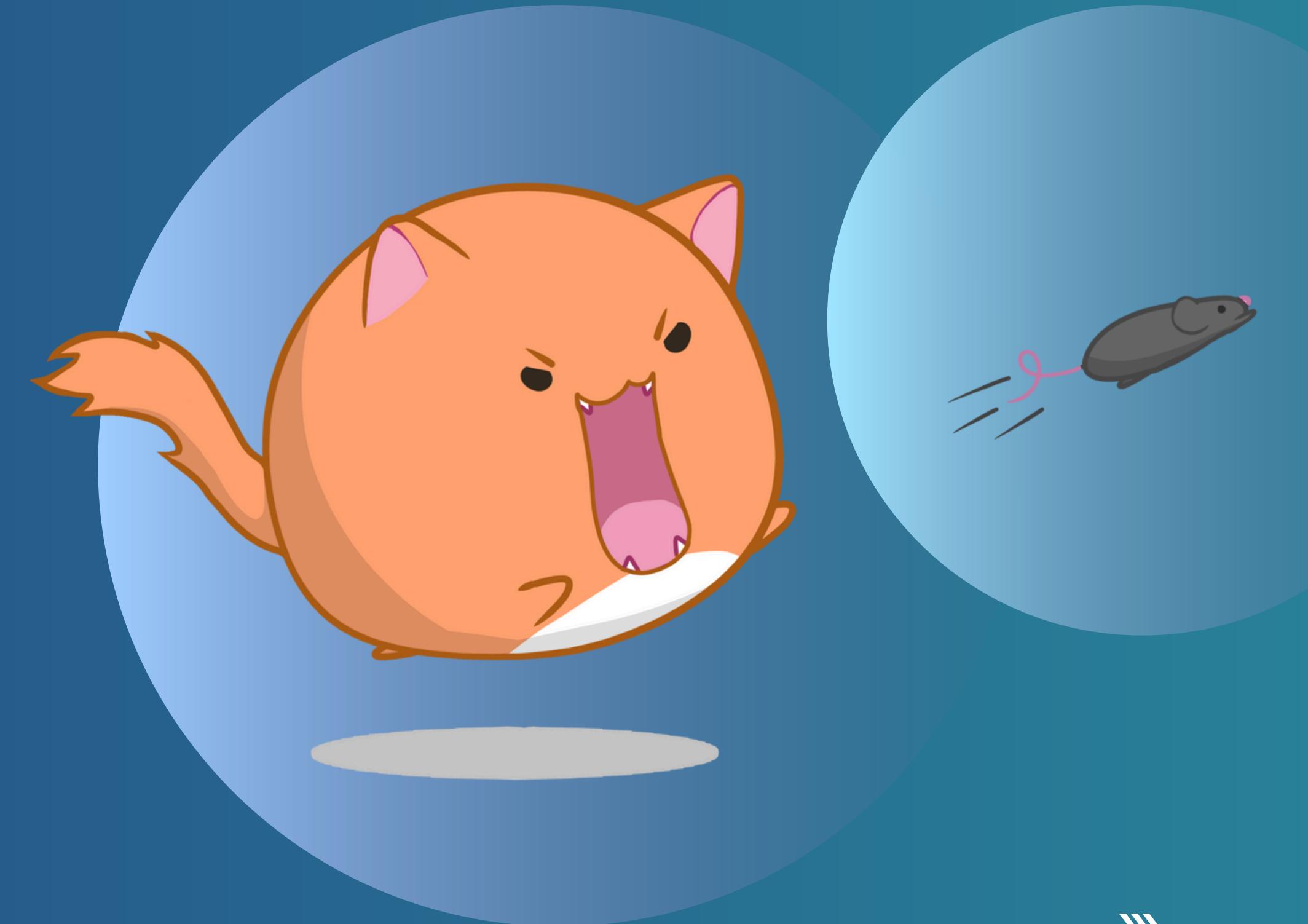


BEST CAT SPLIT-SCREEN GAME



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ABSTRACT

- A **Player vs AI Cat and Mouse Game** where you execute the mouse present in the grid.
- **Who's the best cat?**
- Winning is decided on who executes the mice first.
- Usage of **Genetic Algorithm (GA)** for strategic placement of mousetraps.
- GA improves interception rates while reducing resource utilization.



PROBLEM STATEMENT



PROBLEM:

- An obstacle based game where the player places obstacles as a **weapon** to execute the enemy within the predefined premises.

IMPORTANCE:

- Entertainment usage.
- Target interception
- Strategy Planning
- Applicable in Military defense systems, and surveillance.



PROPOSED SOLUTION

- Use a genetic algorithm to optimize:
- AI decision-making for mousetraps placement.
- Target interception and adaptive gameplay.
- Resource efficiency by minimizing mousetraps

Applications :

- Enhances game AI, defense systems, and surveillance with intelligent strategies.





METHODOLOGY

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1. Initialization

Generate random mousetrap configurations

2. Fitness Evaluation

Evaluate how each configuration intercepts the targets

3. Selection

Pick best-performing mousetrap based on fitness evaluation

4. Crossover

Combine the configurations of two parents mousetrap to create new solution

5. Mutation

Randomize mousetraps positions for diversity (mutation rate)

6. Termination

Repeat until optimal solution is found

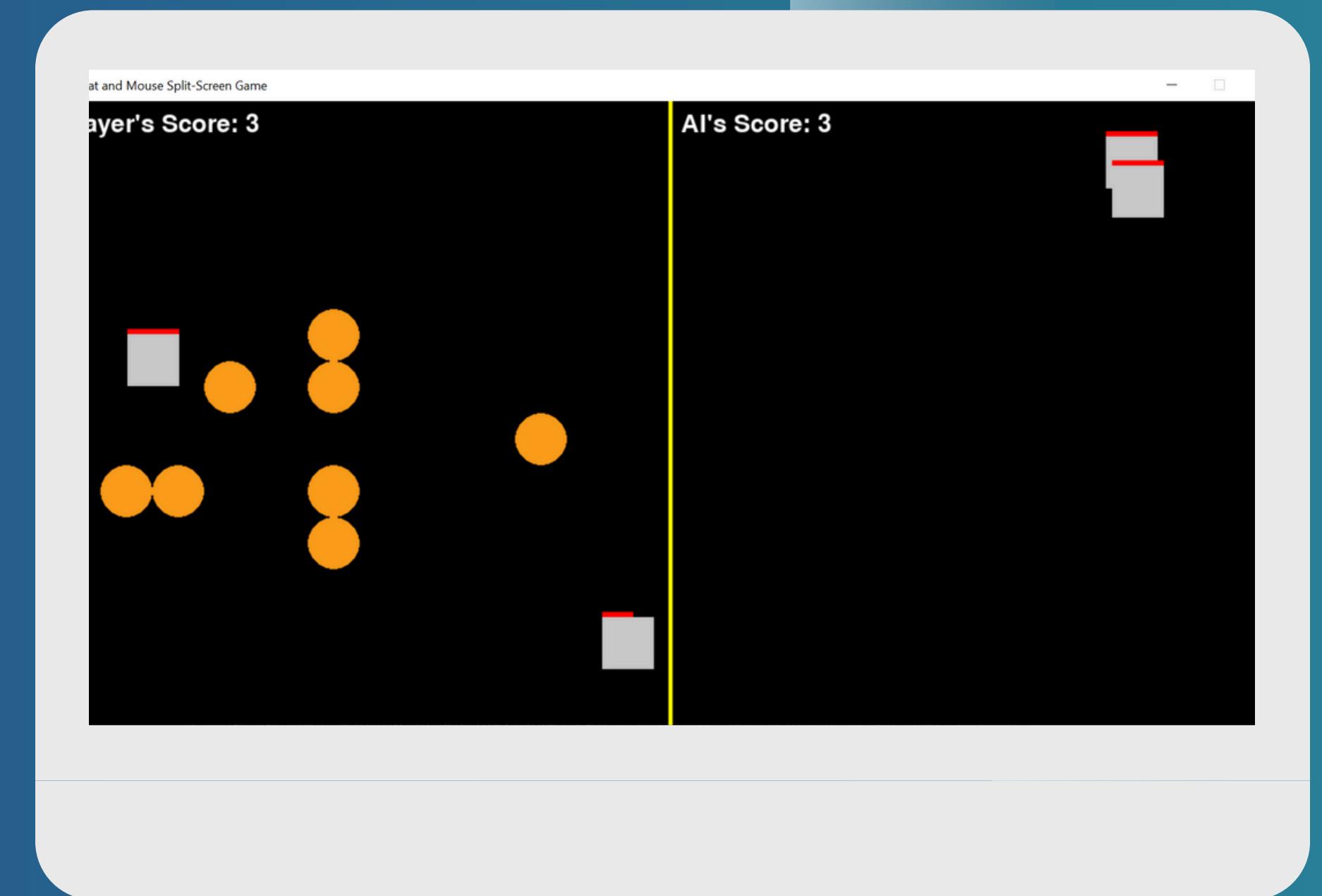


RESULTS

- Higher interception rate (95%).
- Fewer mousetraps usage

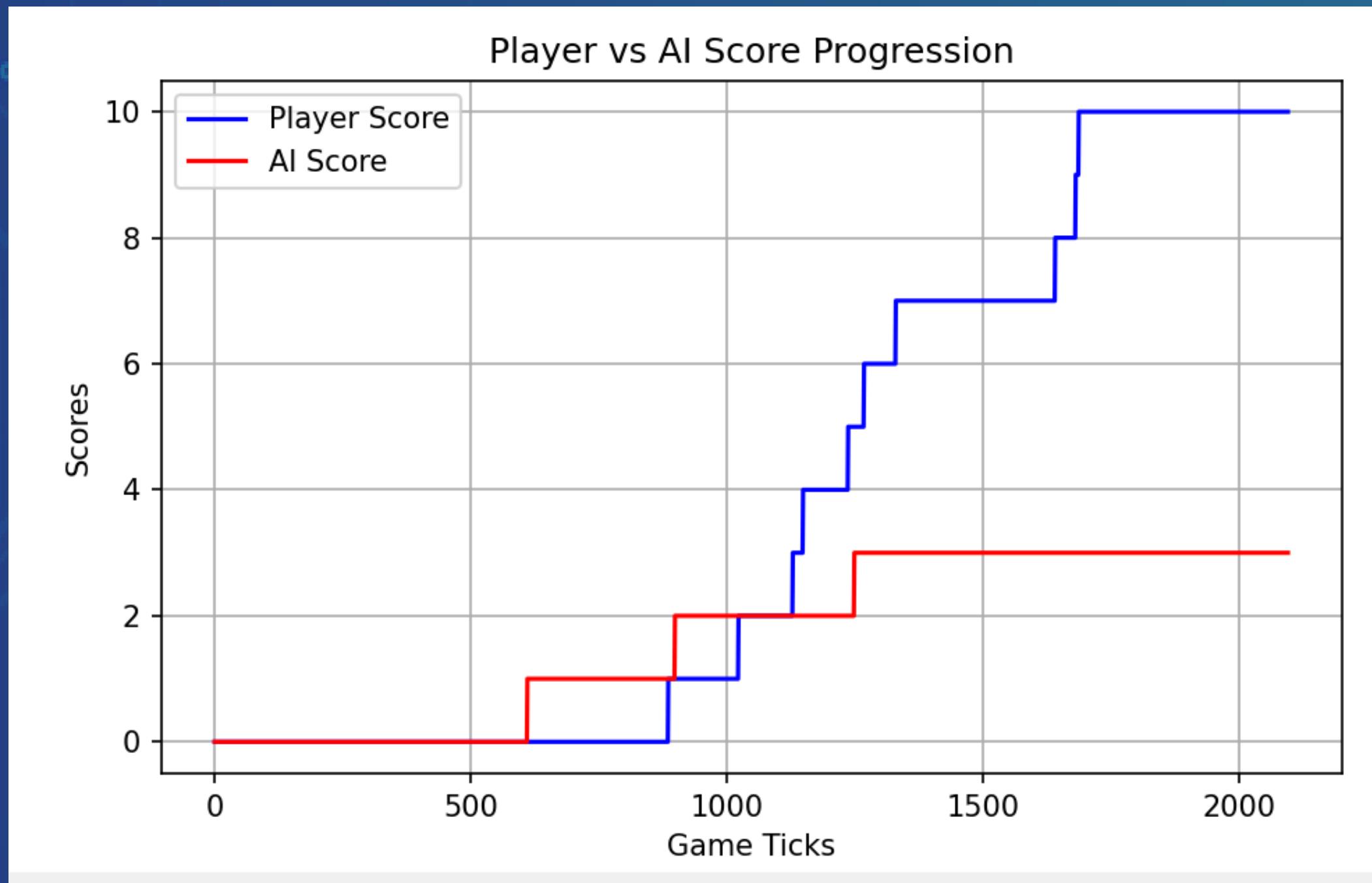
KEY FEATURES:

- Time to execute all mice
- No. of Mice killed by Player and AI.



GRAPH

08/11



score_logs_20241217_103415.csv

	Tick	Player_Score	AI_Score
1	1	0	0
2	2	0	0
3	3	0	0
4	4	0	0
5	5	0	0
6	6	0	0
7	7	0	0
8	8	0	0
9	9	0	0
10	10	0	0
11	11	0	0





FUTURE IMPROVEMENT

- Real-time Optimization: Enhance dynamic decision-making during gameplay.
- Dynamic Scenarios: Introduce obstacles to simulate more complex environments.
- Algorithm Comparisons: Evaluate performance against other algorithms like PSO and ACO.



CONCLUSION

GA optimizes mousetraps placement by:

- Improving target interception efficiency.
- Reducing the number of resources (towers) needed.
- Enhancing AI decision-making for better game strategies.





THANK YOU!

