# BRENDA SANCHEZ
Software Engineer

1techieSanchez@gmail.com · http://github.com/1BrendaSanchez · http://linkedin.com/-brenda-sanchez

## Pirate Intelligent Agent for Treasure Hunt

*Key Skills: Reinforcement Learning, Deep Q-Learning, Neural Networks*

- Created an intelligent agent to navigate a maze and locate hidden treasure using a **deep Q-learning algorithm**.
- Designed a neural network to approximate **Q-values**, enabling the agent to predict optimal actions based on rewards and penalties.
- Implemented an **8x8 matrix environment** representing the maze, with cells for open paths, obstacles, and the treasure location.
- Trained the agent using **experience replay**, improving decision-making by learning from past experiences while reducing overfitting.

## Reinforcement Learning and Pathfinding

*Key Skills: Exploration vs. Exploitation, Algorithm Optimization, Hyperparameter Tuning*

- Balanced **exploration** (trying new paths) and **exploitation** (using known best paths) to ensure efficient learning.
- Tuned hyperparameters such as **learning rate**, **discount factor**, and **epsilon decay** to improve model performance.
- Used the **Bellman equation** to iteratively update Q-values based on state-action rewards, optimizing the pathfinding process.

## Ethical Considerations in AI

*Key Skills: AI Ethics, Bias Mitigation, Responsible Development*

- Ensured that the AI agent operated **fairly and efficiently**, without favoring specific paths based on biased assumptions.
- Prioritized **algorithm transparency**, documenting decision-making processes to ensure ethical deployment.
- Highlighted the importance of **user trust** by focusing on software reliability, secure data handling, and responsible AI practices.

## Real-World Applications and Impact

*Key Skills: AI Problem-Solving, Intelligent Systems, Innovation*

- Demonstrated how **reinforcement learning** can solve complex navigation problems applicable to **robotics**, **autonomous systems**, and **supply chain optimization**.
- Applied AI algorithms to a **dynamic environment**, showing how intelligent agents can adapt to real-world challenges through continuous learning.

## Key Outcomes and Impact

- Successfully trained an AI agent to **outperform human players** in navigating complex maze environments.
- Enhanced understanding of **deep reinforcement learning**, **neural networks**, and **algorithmic problem-solving**.
- Developed expertise in **ethical AI design**, ensuring fair, unbiased, and user-centric intelligent systems.