Antonio Guillen-Perez

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AI Research Scientist with a Ph.D. in Computer Science and 5+ years of experience in Deep Reinforcement Learning (DRL), multi-agent systems, and large language models (LLMs). Proven track record at top-tier AI conferences (NeurIPS, AAAI) and applying cutting-edge ML techniques to real-world tasks like intelligent traffic management, wireless communication optimization, sustainable data center control, and LLM robustness and refinement.

Experience

- **Hewlett-Packard Enterprise (HPE) - AI Labs** — Milpitas-San Jose, CA
  AI Research Scientist — *Sep 2022 - Present*
  - **Research on Sustainable Systems:** Led cutting-edge research on multi-agent deep reinforcement learning (DRL) to optimize data center operations, achieving significant reductions in energy consumption, carbon footprint, and water usage.
  - **LLM Research & Robustness:** Contributed to advancements in Large Language Models (LLMs) by developing ensemble-based self-refinement techniques to improve performance and mitigate hallucinations. Co-authored related work published at NeurIPS 2023.
  - **Publications & Benchmarking:** Co-authored *SustainDC: Benchmarking for Sustainable Data Center Control*, accepted at NeurIPS 2024. Contributed to AAAI 2024 and NeurIPS 2023 on projects focusing on carbon footprint reduction and sustainable AI applications.
  - **Modeling & Optimization:** Developed hybrid solutions combining DRL, genetic algorithms, and CFD surrogate models to enable real-time optimization in complex environments.

Education

- **Ph.D. in Computer Science (CUM LAUDE)** — Murcia, Spain
  Polytechnic University of Cartagena (UPCT), Spain — *Sep 2018 - Jun 2022*
  - Focus on DRL for Connected Autonomous Vehicles and urban traffic optimization.
  - Reduced waiting times (50%) and emissions (45%) at intersections using MADRL.
  - Explored 5G/6G integration and Learning-from-Demonstrations for faster MADRL training.

- **Predoctoral Researcher Visitor** — CA, USA
  University of California, Davis, CA — *Jun 2021 - Jan 2022*
  - Worked on AI for healthcare (throat cancer detection) with over 90% accuracy.
  - Co-authored a Nature - Scientific Reports publication on multimodal neural networks for disease detection. Link

Selected Publications

- **Naug, A., Guillen-Perez, A.**, et al. "SustainDC: Benchmarking for Sustainable Data Center Control." *NeurIPS 2024 (Datasets and Benchmarks)*. Link
- **Sarkar, S., Naug, A., Guillen-Perez, A.**, et al. "Sustainability of Data Center Digital Twins with Reinforcement Learning." *AAAI 2024*. Link
- **Guillen-Perez, A.**, Cano, M.-D. "Multi-Agent Deep Reinforcement Learning to Manage Connected Autonomous Vehicles at Tomorrow's Intersections." *IEEE Transactions on Vehicular Technology*, 2022. Link
- **Guillen-Perez, A.**, Cano, M.-D. "Learning from Oracle Demonstrations — A New Approach to Autonomous Intersection Management Based on Multi-Agent DRL." *IEEE Access*, 2022. Link
- S Sarkar, AR Babu, V Gundecha, **A Guillen**, S Mousavi, R Luna, ... "N-Critics: Self-Refinement of Large Language Models with Ensemble of Critics." *NeurIPS 2023 Workshop on Robustness of Few-shot and Zero-shot Learning*, 2023. Link
- S Sarkar, A Naug, RL Gutierrez, **A Guillen-Perez**, ... "Real-Time Carbon Footprint Minimization in Sustainable Data Centers with Reinforcement Learning." *NeurIPS 2023 Workshop on Tackling Climate Change with ML*, 2023. Link

Skills

- **Programming:** Python (expert), Git, Github, Docker.
- **AI Tools:** PyTorch, TensorFlow, RLLib, Ray, OpenAI Gym.
- **Modeling:** CFD tools (6SigmaDCX), Modelica/FMU for system simulations.
- **Communication:** LaTeX, Adobe Suite. Clear technical writing and presentations.