

# Antonio Guillen-Perez

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Passionate **machine learning** and **AI research scientist** with **+4** years of experience in **applied AI**, and **deep reinforcement learning**. During my **Ph.D.**, I have researched solving **real-world problems** such as **cooperative autonomous driving** using **multi-agent deep reinforcement learning**, pedestrian flow **forecasting** with predictive algorithms, and **health biomarker** analysis for throat cancer.

## SKILLS

### PROGRAMMING

Python, iPython Notebook  
Java, C++

### ARTIFICIAL INTELLIGENCE

Machine Learning (Sklearn)  
Deep Learning (Pytorch, Tensorflow)  
Reinforcement Learning (Gym, MuJoCo)  
AI Healthcare (healthcare.ai, PyHealth)  
Graph Neural Networks (DGL, PyG)  
Multi-Task / Multi-Modal Learning  
Imbalanced Learning  
Zero-Shot Learning  
Meta Learning  
Imitation Learning (IRL, LfO, LfD)  
Time Series Forecasting  
Natural Language Processing (BERT)

### DATA ANALYST

Data Wrangling (Numpy, Pandas)  
Data Visualization (Matplotlib, Seaborn)  
Model Interpretability (Captum)  
Statistics (StatsModels, Scipy)  
High-efficiency software (Dask, CUDA)  
Data Debugging (A/B, Logging, Unittest)  
Git and Github  
Amazon Web Services

## COURSEWORK

### Deep Reinforcement Learning

- Deep Reinforcement Learning - Nanodegree. Udacity  
- Practical Reinforcement Learning. Coursera Course Certificates  
- Practical Deep Reinforcement Learning for Coders v.1. fast.ai

### Computer Vision & Time Series

- Time Series Forecasting. Udacity  
- Sequences, Time Series, and Prediction. deeplearning.ai  
- Convolution Neural Networks in TensorFlow. deeplearning.ai  
- Deep Learning Specialization. deeplearning.ai

## LINKS

Github://AntonioAlgaida  
LinkedIn://antonioguillenperez  
Researchgate://Antonio\_Guillen-Perez  
Google Scholar://Antonio Guillen-Perez

## EXPERIENCE & EDUCATION

### PH.D. | COMPUTER SCIENCE, AUTONOMOUS VEHICLES, AND WIRELESS COMM.

Sep 2018 – Jun 2022 | UPCT | Cartagena, Murcia, Spain

- **Multi-Agent** system trained by **Deep Reinforcement Learning** techniques to control **autonomous vehicles** at intersections in a **cooperative** way using 5G
- I achieved a system capable of effectively controlling **autonomous vehicles** in urban environments that **eliminated accidents** and reduced the **waiting time** by more than **94%** using **collective intelligence**, **learning from demonstration**, and **MADRL**

### PREDOCTORAL STAY | UNIVERSITY OF CALIFORNIA, DAVIS

Jul 2021 – Jan 2022 | Davis, CA, US

- Early detection of throat cancer by biomarker analysis using **NN** specialized in **signal processing** such as **LSTM**, **transformers**, and **attention mechanisms**
- I obtained an accuracy of over **90%** and I have opened a new **research path** for new platforms capable of **detecting** an infinite **number of diseases**

### ASSOCIATE PROFESSOR | DISTRIBUTED SYSTEMS AND SERVICES

Sep 2018 – May 2022 | UPCT | Cartagena, Murcia, Spain

- Introducing the students to the concepts of **distributed systems**, such as communication between **remote processes**, **synchronization**, **coordination** and **agreement** techniques, and finally, learning about the characteristics and operation of various types of distributed services

### DOLPHIN WAVE | ML AND DATA SCIENTIST

Feb 2018 – Sep 2018 | Murcia, Spain

- Build **ML predictive** models for mobility research of **people** in closed environments
- Develop a Deep Learning **Multivariate** Time Series Forecasting technique with **Transformers** for item demands
- Visualization of **univariate** and **multivariate** clusters of people mobility and their **prediction** for **business intelligence** tools

### MS. & BS. | ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

Sep 2016 – Sep 2018 | Murcia, Spain

- Skills in electromagnetic, signal processing, communication systems (WiFi, Bluetooth, 5G, etc.), programming, circuit design, antennas, RADAR, and embedded systems.

## RELATED RESEARCH

### JOURNALS ARTICLES

- G.-P.A. & C.,M.-D., *Multi-Agent Deep Reinforcement Learning to Manage Connected Autonomous Vehicles at Tomorrow's Intersections*, 2022. IEEE Transactions on Vehicular Technology, doi:10.1109/TVT.2022.3169907.
- G.-P.A. & C.,M.-D., *AIM5LA: A Latency-Aware Deep Reinforcement Learning-Based AIM for 5G Communication Networks*, 2022, Sensors, doi:10.3390/s22062217.
- G.-P.A. & C.,M.-D., *Learning from Oracle Demonstrations – A new approach to develop AIM control algorithms based on MADRL*, Under Review. IEEE Access.

### CONFERENCE PROCEEDINGS

- G.-P.A. & C.,M.-D., *RAIM: Reinforced Autonomous Intersection Management*, In 34th Conference (NeurIPS) 2020 - Challenges of Real-World RL Workshop, Virtually.
- G.-P.A. & C.,M.-D., *How super-resolution can help connected autonomous vehicles*, VI doctoral conferences UPCT, University of Murcia. 2020. Oral communication.