# Jorge Muñoz

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## Summary

Machine Learning Engineer with 20+ years of experience in deep learning, LLMs, and AI systems. PhD in AI, founder of ML consultancy, and proven track record delivering production AI solutions for Fortune 500 companies. Expertise spans from cutting-edge research to scalable deployment, with strong focus on generative AI and model optimization.

## Education

**Degree in Mathematics** *October 2020 – September 2025*
*UNED*

**MBA** *October 2011 – November 2012*
*EOI (Escuela de Organización Industrial) Management School*

Part-Time MBA. Funded by EOI (see awards and prizes below). International stay at UCF for a week.

**Ph.D. in Computer Science and Artificial Intelligence** *October 2008 – October 2011*
*University Carlos III of Madrid*

- Research Focus: **Imitation learning** in video games and the development of believable NPCs
- Published papers in international conferences (CIG 2009, CIG 2010, UKCI 2010)
- Won the botprize in 2010 (Turing Test for videogames) with a Conscious Machine cognitive architecture

**Master in Computer Science and Information Technology** *October 2007 – September 2008*
*University Carlos III of Madrid*

Specialization: **Artificial Intelligence**. Funded by the university.

**Computer Science Engineering** *October 2001 – November 2006*
*University Carlos III of Madrid*

- 5 years career with specialization in **Artificial Intelligence**
- Graduated with first-class honors and the best bachelor's thesis

## Experience

**Machine Learning Engineer** *Remote (California, US)*
*Octane Security* *February 2024 – May 2025*

**LLMs** for Smart Contract Vulnerability Detection: As the first ML hire at a blockchain security startup, led development of a multi-stage LLM-based system with over 20 models covering detection, explanation, patch generation, and verification. Reduced false positives from 50% to less than 10%. Helped scale the company from 3 to 10 people.

**Machine Learning Engineer** *Remote (Argentina)*
*Realm Living* *December 2021 – June 2022*

**3D Point Cloud** Instance Segmentation: Developed prototype for large-scale indoor environment analysis, classifying points into semantic objects and grouping them into instances.

**Freelance Deep Learning Engineer/Researcher** *Remote*
*Toptal / Upwork / 10x / Others* *January 2020 – now*

- **Edge AI & Model Optimization**: Developed lightweight **deep learning** models achieving 95%+ accuracy for real-time applications. Optimized face embedding and adversarial detection models, reducing inference time by 85% and model size by 80% for mobile deployment
- **Generative AI for Personalized Content**: Built production-ready image generation pipeline using LoRA-based finetuning of Stable Diffusion models, achieving sub-60 second personalization. Led 6-month GAN training project for facial feature editing, delivering photorealistic results
- **3D World Generation with RL**: 5-month R&D project training reinforcement learning agents to generate

3D environments using Houdini. Developed novel agent architecture operating GUI interfaces directly from natural language prompts

- ○ **Privacy-Preserving Face Synthesis**: Created **GAN**-based system for synthetic face generation maintaining demographic characteristics while ensuring privacy compliance for identity protection applications

**Machine Learning Engineer** *Remote*
*NeuralX Limited* *April 2020 – September 2020*

Stock price prediction models using wavelets, **transformers**, **sequence to sequence** models.

**Founder** *Madrid, Spain*
*Serendeepia* *May 2018 – January 2020*

- ○ Founded and led Serendeepia Research, a specialized **machine learning** consultancy delivering custom AI solutions based on cutting-edge research. Built team of experts in **deep learning** and computer vision
- ○ Served as CEO and CTO, establishing remote-first culture and agile methodology. Implemented scrum and kanban workflows that improved project delivery time by 30%
- ○ Architected ML infrastructure using industry best practices: GitHub with GitFlow, Kubernetes clusters, Jenkins CI/CD, and Polyaxon for experiment management. Reduced model deployment time from weeks to hours
- ○ Scaled company from 3 to 7 engineers, delivered 15+ successful projects for Fortune 500 companies. Led development of B2C products incorporating latest **deep learning** advancements, generating $500K+ in revenue

**Remote Machine Learning Engineer** *San Francisco, USA*
*Chute* *January 2016 – August 2018*

- ○ Solely responsible for processing 1M+ social media images daily (Instagram, Twitter) in real-time. Led **machine learning** infrastructure that scaled to handle platform acquisition by major media company in August 2018
- ○ Built multilabel image classification system with **TensorFlow** and **TensorFlow Serving**, achieving 90%+ accuracy across 50+ categories. Migrated from Caffe to **TensorFlow** for improved performance
- ○ Developed aesthetic scoring model in **TensorFlow** correlating 85%+ with human aesthetic ratings for automated content curation
- ○ Created perceptual hash models using **deep learning** for duplicate detection
- ○ Built end-to-end Python library for training, testing and deploying **TensorFlow** and Caffe models with automated CI/CD pipeline
- ○ Implemented spam filter and user topic detection using Word2Vec embeddings and clustering algorithms in Go

**Remote contractor as Machine Learning Researcher** *San Jose, CA, USA*
*Good AI Lab* *June 2017 – April 2018*

I was in charge to create **Deep Learning** research projects that run in ClusterOne for promoting and testing the platform. For example: Personalized Medicine: Redefining Cancer Treatment with deep learning ↗

**Android lead developer** *London and remote*
*March 2013 – September 2017*

Android lead developer in startups in London (Quipper, Shopcade) and as a remote contractor (Appgree).

**Entrepreneur period** *Madrid, Spain*
*December 2010 – February 2013*

Founded Comaware (Machine Consciousness for games) and Howmaths (AI for math problem solving).

**Visiting research** *Copenhagen, Denmark*
*Center for Computer Games Research, IT University of Copenhagen* *September 2009 – January 2010*

AI research for video games using eye tracking systems and character control.

**Research staff in training** *Madrid, Spain*
*University Carlos III of Madrid* *October 2007 – September 2011*

Supervised bachelor's thesis. Rated as exceptional teacher by students (2008).

**Software developer**                                                          *Madrid, Spain*
                                                                   *December 2006 – August 2007*

Software developer at GTD Ingeniería de Sistemas y Software and Secosol soluciones y domótica.

## Technical Skills

**AI/ML Frameworks & Libraries:** PyTorch, TensorFlow, Transformers (Hugging Face), Stable Diffusion, LangChain, Sentence Transformers, scikit-learn, XGBoost, Caffe, ONNX, TensorFlow Serving
**Generative AI & LLMs:** OpenAI API, Claude API, Llama, Mistral, LoRA fine-tuning, RAG systems, Vector Databases (Pinecone, Weaviate, ChromaDB), Prompt Engineering
**Programming Languages:** Python, C++, Go, Kotlin, Java, Ruby, TypeScript, JavaScript, Bash
**Infrastructure & Cloud:** AWS (EC2, S3, Lambda, SageMaker), GCP (Compute Engine, Cloud Run, Vertex AI), Docker, Kubernetes, Jenkins, GitHub Actions, Terraform
**Data & Tools:** PostgreSQL, MongoDB, Redis, Git, Jupyter, Weights & Biases, MLflow, Polyaxon, FastAPI, Flask, Ruby on Rails

## Awards and prizes

**Winner team of the Human-Like Bot contest**                                        *2011*

Winner project (Comaware) in the national contest for university entrepreneurs organized by EOI. Awarded with an MBA at EOI and a study trip to Silicon Valley.

Winner team of the 5th contests of ideas for creating scientific and technological based companies of the University Carlos III of Madrid with the project Comaware. Six months of incubation in the business incubator of University Carlos III of Madrid.

**Winner team of the 2K BotPrize 2010 international contest**                          *2010*

The 2K BotPrize is an adaptation of the Turing test to video games. Monetary prize of a $2,000 and a trip to 2K studios in Canberra, Australia.

Winner of the Car Set-up Optimization competition (using TORCS as simulator). $500 prize.

**Rated by the students as an exceptional teacher**                                   *2008*

Congratulated by the University Carlos III of Madrid.

**Graduated with first-class honours and best bachelor's thesis**                     *2006*

**Scholarship for outstanding academic achievement**                                  *2005*

Scholarship for outstanding academic achievement in the course 2005-2006.

**Finalist in the national Spring Mathematics Contest**                               *1999*

Finalist in the fourth edition of the national ***Spring Mathematics Contest*** held at the University Complutense of Madrid.

**Finalist in the national Spring Mathematics Contest**                               *1998*

Finalist in the third edition of the national ***Spring Mathematics Contest*** held at the University Complutense of Madrid.

## Media Appearances

**Killer Bots Are Getting Human** ⬈                                          *October 2010*

John Bohannon. Science. Vol 330. no. 6000. pp. 30-31. **Science**

**The Awakening of Conscious Bots** ⬈                                        *October 2010*

*Inside the Mind of the 2K BotPrize 2010 Winner*, **aigamedev.com**

**Unreal Tournament 2010** ⬈                                               *September 2010*

*Narrowing the Gap between Human and Bot.* Surfdaddy Orca. **h+ magazine**

**Un equipo español queda en primer lugar del 2K BotPrize 2010** ⬈          *September 2010*

*A Spanish team win the 2K BotPrize 2010.* Lektu / Microsiervos. **lainformacion.com**

## Talks

**Conciencia Artificial en Videojuegos** *March 2011*

Guest speaker in the VI Days of Imaginática 2011. University of Sevilla. *Machine consciousness in video games: designing more human-like machines.*

## Publications

**Predicting microbiomes through a deep latent space** *2021*

García-Jiménez, Beatriz; *Muñoz, Jorge*; Cabello, S.; Medina, J.; & Wilkinson
Bioinformatics, 37(10), 1444-1451.

**Personalized Medicine: Redefining Cancer Treatment with deep learning** *2017*

*Jorge Muñoz*

**Towards imitation of human driving style in car racing games** *2012*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
Believable Bots, 289-313, Springer Berlin Heidelberg

**A machine consciousness approach to the design of human-like bots** *2012*

Raúl Arrabales, *Jorge Muñoz*, Agapito Ledezma, German Gutierrez, Araceli Sanchis
Believable bots, 171-191, Springer Berlin Heidelberg

**¿Máquina o humano?** *2011*

Raúl Arrabales Moreno, *Jorge Muñoz Fuentes*
May 2011, Investigación y Ciencia: Edición Española de Scientific American

**Multi-objective evolution for car setup optimization** *2010*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
September 2010, Proceedings of the 10th Annual Workshop on Computational Intelligence, Essex, England

**A human-like TORCS controller for the Simulated Car Racing Championship** *2010*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
August 2010, Proceedings 2010 IEEE Conference on Computational Intelligence and Games, Copenhagen, Denmark

**Controller for TORCS created by imitation** *2009*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
September 2009, Proceedings 2009 IEEE Conference on Computational Intelligence and Games, Milano, Italy

**Evolutionary genetic algorithms in a constraint satisfaction problem: Puzzle Eternity II** *2009*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
June 2009, Proceedings 10th International Work-Conference on Artificial Neural Networks, Salamanca, Spain

**Evolutionary techniques in a constraint satisfaction problem: Puzzle Eternity II** *2009*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
May 2009, Proceedings 2009 IEEE Congress on Evolutionary Computation, Trondheim, Norway

**Evolutionary genetic algorithms in a constraint satisfaction problem: Puzzle Eternity I** *2008*

*Jorge Muñoz*, German Gutierrez, Araceli Sanchis
May 2008, Proceedings 2008 IEEE Congress on Evolutionary Computation, Trondheim, Norway