

# Oscar Guarnizo

MACHINE LEARNING ENGINEER · JUNIOR RESEARCHER

050102, Latacunga, Ecuador

☎ (+593) 998702581 | ✉ oscar.guarnizo9619@gmail.com | 🏠 zosov.github.io | 📺 ZosoV | 📧 oscar-guarnizo

I am an IT engineer with experience in computer science and artificial intelligence. My skills rely on formal work experience and independent research related to Deep Learning, Machine Learning, and Mathematics. Currently, I ended a temporal Machine Learning Engineer position at Mobia Latam. Additionally, I work on ML projects as a part-time Junior Researcher in DeepARC Research. Despite my experience with computer vision applications, I am willing to work on any AI/ML project to broaden my knowledge.

## Education

### Yachay Tech University

B.SC IN INFORMATION TECHNOLOGY

Urcuqui, Ecuador

April 2015 - March 2020

- Received the *Cum Laude* recognition, CGPA 9.3/10, second-best grade of the promotion.

## Experience

### Machine Learning Engineer

Santiago, Chile

MOBIA LATIN AMERICA

April 2022 - Jul 2022 · 4 mos

- Developed a multistream license plate recognition system by assembling an **Nvidia deepstream** pipeline, training 3+ models with the **Nvidia TAO toolkit**, and periodically sending data streams to a **Kafka Apache** cluster for further use-cases.
- Lead a small ML team for building an end-to-end LPR system by using a Kanban method to deal with incremental software deliveries.

### Junior Researcher | Co-founder

Urcuqui, Ecuador

DEEPARC RESEARCH

June 2021 - Present · 1 yr 2 mos

- Increased and encouraged AI/ML research opportunities for young undergraduates by co-founding a non-profit organization, including the collaboration of 11 members and sending 15+ articles to international conferences and journals up to date.
- Created an international network/cooperation between the University of Pernambuco, Brazil, and Yachay Tech, Ecuador, by participating in a reinforcement learning research based on **Deep Q-Learning** for goal-oriented navigation.

### Research Intern

Thuwal, Saudi Arabia

KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KAUST)

March 2021 - Aug. 2021 · 6 mos

- Implemented **Image2StyleGAN** from scratch using **PyTorch** for adding further experimentation consisting in a cross-domain embedding between Anime and Human Faces **StyleGAN** generators, resulting in an article poster presented at **EEML Summer School 2021** organized by **DeepMind**.
- Implemented 5 subsequent image processing tasks (morphing, style transfer, expression transfer, inpainting, and super-resolution) to interpret my StyleGAN embedding results.

### Machine Learning Engineer

Santiago, Chile

DIGEVO - OMIA AI GROUP

July 2020 - March 2021 · 10 mos

- Improved the performance of a precision farming system based on **MaskRCNN** by adding 3 additional sub-tasks (tracking, counting, and spatial correlation) using TensorFlow, **OpenCV**, PyTorch, and **Pandas**.
- Increase the files formats capacity of an **Airflow ETL service** by adding 3+ transforms components to process metadata flows into a database.

### Junior Researcher | Coordinator | Undergraduate Researcher

Urcuqui, Ecuador

YACHAY SCIENTIFIC COMPUTING GROUP (SCG)

Feb 2019 - Apr 2022 · 3 yr 3 mos

- Researched an extended project for initializing an ACO algorithm with random walks and an evaluation through **PCA**, resulting in an article.
- Supervised 3+ research projects supporting undergraduate students by suggesting programming and conceptual practices, culminating in 2 thesis projects in chemistry and biology and 2 research articles on computer vision for breast cancer detection and smart agriculture.
- Researched a vanilla path planning issue based on Ant Colony Optimization (ACO) as part of my undergraduate thesis, published at LACCI 2019.

## Projects

### ALPR System

📄 SOURCE CODE

Developed the entire process (data preparation, training, deployment) for an Automatic License Plate Recognition (ALPR) system using Nvidia TAO Toolkit, Nvidia Deepstream SDK, and Kafka Apache.

### Covariance Tensor

📄 SOURCE CODE

Developed a method to extract image features using tensor decomposition to model data in one step-forward by programming CNN for classification using Keras (TensorFlow), published at IEEE Access.

### Medium Blog

📄 OSCAR-GUARNIZO

Created a blog on Medium to increase my professional exposure by publishing regular posts about Deep Learning, Machine Learning, and Learning Techniques.

## Skills

### SKILLS

Spanish (Native) | English (TOEFL C1 - 104/120)

### Confident

Python | Latex | C | PyTorch | Tensorflow | Nvidia Deepstream | Nvidia TAO Toolkit

### Familiar

Matplotlib | Pandas | OpenCV | Docker | Kafka | Amazon AWS | Airflow | Unix

### COURSEWORK

Artificial Intelligence & Neural Networks  
Fundamentals of Programming\*  
Databases Management  
Operating Systems  
Functional Programming\*\*  
Computer Graphics & Image Processing  
Probabilities and Statistics\*\*

### MOOC TRAINING

Deep Learning Specialization  
Video AI Applications on Jetson Nano  
Machine Learning  
Data Structures + Algorithms  
Learning How to Learn  
Neuromatch Deep Learning Academy 2021  
\*Teaching Assistant  
\*\*Research Assistant

## Publications

---

### PUBLISHED

- Fonseca R, **Guarnizo O**, Suntaxi D, Cadiz A, Creixell W. *Convolutional Neural Network Feature Extraction Using Covariance Tensor Decomposition*. IEEE Access. 27 Apr 2021; pp. 9:66646-60. (Open Access, Peer-reviewed)
- J. Pereira, D. Suntaxi, **O. Guarnizo**, F. Villalba, and D. Almeida. *Comparison between Two Novel Approaches in Automatic Breast Cancer Detection and Diagnosis and its Contribution in Military Defense*. Springer, Singapore, 2021; pp. 12. (Peer-reviewed)
- **O. Guarnizo** and I. Pineda. *Three Dimensional Adaptive Path Planning Simulation Based On Ant Colony Optimization Algorithm*. The Sixth IEEE Latin American Conference on Computational Intelligence LA-CCI, IEEE. 11 Nov 2019; pp. 1-6. (Peer-reviewed)
- J. R. González, F. P. Zhapa, **O. V. Guarnizo** and F. Ortega-Zamorano. *Successive Adaptive Linear Neural Modeling for Equidistant Real Roots Finding*. Third Ecuador Technical Chapters Meeting (ETCM), IEEE. 15 Oct 2018; pp. 1-6. (Peer-reviewed)

**NOTE** : conferences and presentations about my research work can be found in  [RESEARCH](#) and my  [PORTFOLIO](#).

## Leadership & Awards

---

- 2022 **Best Research Poster Award - EEML Summer School 2022**, Award Recipient at [Vilnius, Lithuania](#) · [Virtual](#).  
Awarded as a top 5/100 best research poster during the EEML Summer School 2022 poster sessions organized by DeepMind
- 2021 **Scientific Computing Summer School 2021 Organizer**, Organizing Committee Member at [Urcuqui, Ecuador](#) · [Virtual](#).  
Coordinated the SCG summer school 2021 plan to increase the exposure of the research group by addressing machine learning topics and reaching around 300 national/international applications, including Ecuador, India, Greece, Colombia, among others.
- 2021 **Deep Learning and Computer Vision Instructor**, Associate Instructor at [Urcuqui, Ecuador](#) · [Virtual](#).  
Lectured 23+ undergraduate students 4 hours per week during two months on an “Introduction to Deep Learning and Computer Vision” course by imparting deep learning fundamentals, particularly studying convolutional neural networks and transfer learning.
- 2020 **Higher Education Scholarship**, Scholarship Recipient at [Ibarra, Ecuador](#).  
Hold a scholarship covering \$22,000 for all undergraduate expenses from 2015-2020, conferred to outstanding students by Instituto de Fomento del Talento Humano (IFTH) & SENESCYT.
- 2019 **Top Finalist - International Tournament (TuApp 2019)**, Finalist at [Tabasco, Mexico](#).  
Selected as a top 60/200 finalist in an international innovation contest for high-achieving Latinx talent in tech by presenting an app based on computer vision and augmented reality for license plate recognition.
- 2019 **Volunteer ENES Training Program**, Associate Instructor & Volunteer at [Ibarra, Ecuador](#).  
Lectured 15+ low-income high school students 4 hours per week during 4 months for the higher education admission exam by imparting fundamental math concepts and problems, reaching 90% students obtaining high scores of over 900/1000.
- 2018 **Top Finalist - International Tournament (TuApp 2018)**, Finalist at [Lima, Peru](#).
- 2017 **Volunteer Program: Use and Diffusion of Technologies**, Volunteer at [Quito, Ecuador](#).
- 2017 **Yachay Open Source Software Club**, Member at [Urcuqui, Ecuador](#).  
Participated in weekly meetings and programs for encouraging the usage of open-source software tools in society and build networks on and off-campus by organizing yearly the Latin American Festival of Open Source Installation - Flisol.

## Certificates

---

- 2022 **Deep Learning Specialization**, Virtual Student at [Coursera](#) · [Virtual](#).  
Working on the specialization, including 5 courses: 1. Neural Networks and Deep Learning, 2. Improving Deep Neural Networks, 3. Structuring Machine Learning Projects, 4. Convolutional Neural Networks, and 5. Sequence Models (ended 3/5 courses until now).
- 2022 **Building Video AI Applications at the Edge on Jetson Nano**, Virtual Student at [Nvidia Deep Learning Institute](#) · [Virtual](#).
- 2022 **Machine Learning**, Virtual Student at [Coursera](#) · [Virtual](#).
- 2022 **Master the Coding Interview: Data Structures + Algorithms**, Virtual Student at [Udemy](#) · [Virtual](#).
- 2022 **Learning How to Learn: Powerful mental tools to help you master tough subjects**, Virtual Student at [Coursera](#) · [Virtual](#).
- 2021 **Neuromatch Summer School 2021**, Interactive Student & Project Lead at [Los Angeles, United States](#) · [Virtual](#).  
Selected as an international participant for a three-week intensive training program based on theoretical DL modeling and computational techniques, culminating in a transfer learning project for MRI Tumor Classification using PyTorch and Kaggle Dataset.
- 2021 **Eastern European Machine Learning Summer School 2021**, Apprenticeship at [Budapest, Hungary](#) · [Virtual](#).  
Selected as one of 500+ international participants for a one-week highly competitive summer school on Deep Learning and Reinforcement Learning organized by DeepMind based on leadership potential and research skills, submitting an article reproduction *Image2StyleGAN*.
- 2021 **Vilnius Machine Learning Workshop 2021**, Apprenticeship at [Vilnius, Lithuania](#) · [Virtual](#).  
Participated in a two-day workshop on Deep Learning, Reinforcement Learning, and Causal Inference for supporting the ML community.
- 2021 **International Summer School on Deep Learning 2021**, Apprenticeship at [Gdańsk, Poland](#) · [Virtual](#).  
Selected as one of 300 participants international-wide for a one-week summer school on modern Deep Learning for high-achieving talent in research based on leadership and academic success.
- 2021 **Workshop on Mathematical Introduction to Reinforcement Learning**, Apprenticeship at [Lahore, Pakistan](#) · [Virtual](#).  
Selected as one of 100 participants international-wide for a three-day practical workshop on RL mathematical fundamentals, reviewing model-based, value-based, and policy-based methods, connecting with two RL experts.
- 2020 **GMTK Game Jam 2020**, Apprenticeship at [Virtual Space](#).  
Developed a retro video game in 48 hours named “Ride to the Heaven”
- 2018 **Workshop on Implementation of Genetic Algorithms in Wolfram**, Apprenticeship at [Cuenca, Ecuador](#).
- 2017 **Workshop on HPC, Big Data and Application I & II - IBM Ecuador**, Apprenticeship at [Urcuqui, Ecuador](#).