

NICOLÁS AYOBÍ

ML Engineer ~ Data Scientist

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 Nicolas Ayobi

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SUMMARY

Experienced machine learning (ML) engineer with a 4-year background in computer vision, natural language processing, deep learning, and artificial intelligence. I recently graduated from the University of los Andes with a Master's in Biomedical Engineering, funded and mentored by Google DeepMind, and focusing on AI applications for public health. I possess academic and practical experience developing and implementing AI-based benchmarks and solutions for research and industry challenges. I seek opportunities to leverage my deep learning expertise and drive innovative products at an industrial scale.

WORK EXPERIENCE

Bogotá, Colombia
Jun/2023 – Aug/2024

Freelance Machine Learning Consultant and Developer
Plibots

- Analyzed client data and requirements and evaluated possible machine-learning solutions.
- Developed a software service with an AI trained to prevent work accidents in field operations.
- Built and trained real-time video human detection networks to run on CPUs.

Bogotá, Colombia
Jan/2021 – Aug/2024

Research Assistant in AI
Center for Research and Formation in Artificial Intelligence

- Led diverse research projects focusing on computer vision and deep learning, including vision-language integration, video analysis for surgery, and pedestrian safety.
- Formulated 4 new AI datasets along with transformers-based and CNN-based solutions.
- Published 8 articles with novel state-of-the-art models in 5 top-tier AI journals and conferences, with an acceptance rate of 77% and an oral presentation rate of 80%.

TEACHING EXPERIENCE

Bogotá, Colombia
Jan/2022 – Dec/2023

Graduate Teaching Assistant
Universidad de Los Andes

- Taught laboratory classes and practical workshops using learning contents created by me.
- Formulated theoretical and practical evaluations and provided feedback.
- Guided and mentored students in more than 15 research projects about applications of AI.

Courses Taught: *Summer School on Deep Learning Research (3 months)* • *Advanced Machine Learning (2 semesters)* • *Computer Vision (1 semester)* • *Coursera's Master's Degree in Artificial Intelligence by Uniandes (10 months)*

Bogotá, Colombia
Jan/2020 – Dec/2021

Undergraduate Teaching Assistant
Universidad de Los Andes

- Helped the teachers with course planning and learning content development.
- Assisted and guided students on class topics, projects, and assignments.
- Created practical workshops and graded assignments developed in the courses.

Courses Taught: *Introduction to Programming (1 semester)* • *Data Structures in Java (2 semesters)* • *Data Structures in Python (1 semester)* • *Image Analysis and Processing (1 semester)*

EDUCATION

Bogotá, Colombia
Jan/2022 - Dec/2023

Master's degree in Biomedical Engineering (DeepMind Scholar)
Universidad de los Andes

- Research master's degree focused on computer vision applications to public health.
- GPA: 4.87/5.0
- Relevant Courses: *Computer Vision & Advanced Machine Learning.*

Bogotá, Colombia
Aug/2017 - Dec/2021

Bachelor's degree in Biomedical Engineering (Cum Laude)
Universidad de los Andes

- Minor in Computational Mathematics and in Bioinformatics.
- GPA: 4.54/5.0; Graduation Class Ranking: 3/42
- Relevant Courses: *Data Structures, Image Analysis & Processing, Algorithmic Design and Analysis, Scientific Programming, Structural Mathematics, Object Oriented Programming.*

Sydney, Australia
Aug/2019 - Dec/2019

Undergraduate Exchange Program in Engineering
University of New South Wales

- Relevant Courses: *Signal Processing & Mechanics of the Human Body*

SKILLS

Programming Languages:
Proficient: Python, Java, Bash, MATLAB
Intermediate: HTML, CSS, SQL
Basic: R, C++

Tools & Frameworks:
Proficient: Excel, GitHub, L^AT_EX
Intermediate: Docker, AWS, Flask
Basic: Django

Machine Learning Frameworks:
Proficient: Pytorch, OpenCV, Hugging Face, NLTK
Intermediate: Scikit-Learn
Basic: Tensorflow, H2O

Artificial Intelligence Models & Algorithms
Deep Learning: LLMs, Transformers, Foundation Models, CNNs, RNNs
Machine Learning: AutoML, SVMs, Random Forest, k-NN, K-Means

Languages
English - C2 (professional level)
Spanish - native

HONOURS & AWARDS

Cum Laude Graduation By: Universidad de los Andes	Bachelor's graduation honor for GPAs in the top 3% of historical GPAs in the Engineering Faculty.
DeepMind Scholarship By: Google DeepMind	Postgraduate scholarship and mentorship provided by Google Deepmind to top 3 applicants.
Uniandinos Scholarship By: Uniandinos Association	Semestral scholarship for undergraduate students with outstanding GPAs (4 semesters).
Top 10 GPAs By: Biomedical Engineering	Semestral distinction to biomedical engineering students with the top 10 GPAs (3 semesters).

CAREER ACHIEVEMENTS

Outstanding Reviewer By: MICCAI 2024	Distinction for top 12 reviewers of the MICCAI 2024 Conference on medical AI.
Best Student Paper Award By: Road++ Workshop, 2023	Main author of the Best Student Paper at ROAD++ Workshop on Event Detection for Situation Awareness in Autonomous Driving, hosted at ICCV 2023.
Challenge Winner By: SAR-RARP50 Challenge, 2022	Leader of the winning team of two out of three sub-challenges and runner-up of the third sub-challenge of the SAR-RARP50 Challenge hosted at MICCAI 2022.
Challenge Runner-up By: PitVis Challenge, 2023	Advisor of the runner-up team in the multi-task sub-challenge of the PitVis Challenge hosted at MICCAI 2023.

SELECTED PUBLICATIONS

Video Analysis for Robotic Surgery	<i>Pixel-Wise Recognition for Holistic Surgical Scene Understanding</i> Nicolás Ayobi, Santiago Rodríguez, Alejandra Pérez, Isabela Hernández, et al., Pablo Arbeláez • Collaboration with Fundación Santa Fe de Bogotá. • Published in ArXiv, In revision for Medical Image Analysis 2024.	Project Repository Link
Computer Vision & NLP	<i>PiGLET: Pixel-Level Grounding of Language Expressions With Transformers</i> Cristina González, Nicolás Ayobi, Isabela Hernández, Jordi Pont-Tuset, Pablo Arbeláez. • Collaboration with Google Research Zurich. • Published in IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2023.	Project Page Link
AI for Pedestrian Safety	<i>STRIDE: Street View-based Environmental Feature Detection and Pedestrian Collision Prediction</i> Cristina González* & Nicolás Ayobi*, et al., Olga L. Sarmiento, D. Alex Quistberg, Pablo Arbeláez. • Collaboration with Drexel University. • Oral Presentation at the ROAD++ Workshop of the IEEE/CVF International Conference in Computer Vision (ICCVW) 2023.	Project Repository Link
Surgical Image Segmentation	<i>MATIS: Masked-Attention Transformers for Surgical Instrument Segmentation.</i> Nicolás Ayobi, Alejandra Pérez-Rondón, Santiago Rodríguez, Pablo Arbeláez. • Presentación oral en IEEE International Symposium on Biomedical Imaging (ISBI) 2023.	Project Repository Link
Computer Vision & NLP	<i>Panoptic Narrative Grounding</i> Cristina González, Nicolás Ayobi, Isabela Hernández, Jordi Pont-Tuset, Pablo Arbeláez. • Collaboration with Google Research Zurich. • Oral Presentation at IEEE/CVF International Conference in Computer Vision (ICCV) 2021.	Project Repository Link

INVITED TALKS

Workshop Talk	<i>Applying AI via deep learning to injury research & prevention</i>	World Safety Conference, India, 2024 (upcoming)
Master Class (Virtual)	<i>Holistic Understanding of Image-Guided Surgical Robot Intelligence.</i>	Fundación Santa Fe de Bogotá, 2023
Plenary Talk	<i>Augmented Reality and AI, the Future of Robotic Surgery.</i>	Colombian Symposium on Robotic Surgery, 2023
Industry Talk (Virtual)	<i>Towards Holistic, Multi-level and Granular Robot-Assisted Surgical Video Analysis with Vision Transformers.</i>	Olympus Corporation, Japan, 2023

ATTENDED EVENTS

Oral	International Conference of Computer Vision (ICCV) 2021
Oral	International Conference on Medical Image Computing and Computer Assisted Interventions (MICCAI) 2022
Grant	EMBS-SPS Summer School on Medical Imaging, 2023
Oral	International Symposium on Biomedical Imaging (ISBI) 2023
Oral	International Conference of Computer Vision (ICCV) 2023

COURSES & CERTIFICATES

Coursera	Introduction to Software Engineering
Coursera	Python for AI and Data Science
Coursera	Developing AI Applications in Flask
Coursera	Django Application Development With SQL and Databases
Coursera	(in progress) IBM Back-end Developer