Andrés Felipe Arias Russi

Computer Scientist, Systems Engineer and Mathematician Specializing in Machine Learning and Software Development

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EDUCATION

Universidad de los Andes — Bogotá, Colombia
B.Sc. in Systems Engineering and Computer Science — *Aug 2019 – Dec 2024*
Relevant courses: Machine Learning - Generative Models, Quantum Computing, Data Structures and Algorithms, Algorithm Design and Analysis, Business Intelligence, Computing Infrastructure, Mobile Application Development, Web Development, Database Systems

Universidad de los Andes — Bogotá, Colombia
Bachelor of Mathematics — *Aug 2020 – Dec 2024*
Relevant courses: Statistics, Probability, Differential Geometry, Topology, Mathematical Logic, Information Theory, Numerical Analysis, Theory of Computation, Pattern Recognition, Abstract Algebra, Measure and Integration Theory

SKILLS SUMMARY

- **Soft Skills**: Collaborative problem solver, effective communicator, intellectually curious, open-minded, eager to learn, adaptable to new challenges, resourceful, teamwork, and positive attitude.
- **Programming Languages**: Python (proficient), Java, JavaScript, TypeScript, Dart, MATLAB, C++ (basic).
- **Data Science**: Natural Language Processing, Artificial Intelligence, Machine Learning, Deep Learning, Statistical Modeling, Data Collection and Processing, Variational Inference, Optimal Transport
- **Software Development**: Software Design and Architecture, Human-Robot Interaction, Flask, FastAPI, React, Angular, Svelte, SQL, Flutter.
- **Programming Tools and Libraries**: PyTorch, TensorFlow, scikit-learn, Pandas, NumPy, OpenCV, LangChain, Selenium, BeautifulSoup, Docker, Git, ROS (Robot Operating System).
- **Certifications**: Deep Learning Specialization (Coursera, 2021), Machine Learning (Stanford University, 2020)
- **Languages**: Spanish (Native), English (Fluent).

RESEARCH EXPERIENCE

Cornell University - Cornell Tech — New York City, USA
Research Assistant - Prof. Angelique Taylor — *Jun 2024 – Present*

- **Enhancing Human-Robot Interaction**: Contributing to the AIRLab robotics group by designing teleoperation interfaces and integrating tools to enable autonomous and intelligent robot behavior, focusing on leveraging LLMs for improved interaction. Developing an integrated architecture enabling IP communication with different routing protocols between interfaces, robots, LLMs, and cameras, facilitating real-time data exchange and autonomous decision-making in healthcare robotics.

Universidad de los Andes — Bogotá, Colombia
Research Assistant - Prof. Rubén Manrique — *Aug 2022 – Dec 2023*

- **Natural Language Processing for Biomedical Texts**: Conducted research on leveraging NLP and LLMs to validate and generate Plain Language Summaries (PLS) of biomedical texts; performed statistical analysis and managed large biomedical datasets.

EXPERIENCE

Cornell University - Cornell Tech — New York City, USA
Research Intern - Human-Robot Interaction — *Jun 2024 – Aug 2024*

- **Integrated System Development**: Engineered an IP-based communication framework connecting user interfaces, autonomous robots, LLMs, and cameras to facilitate seamless interaction in healthcare settings.
- **Software and Interface Design**: Designed and implemented user interfaces using Svelte and FastAPI, enhancing usability for healthcare workers interacting with robotic systems.
- **Machine Learning Integration**: Integrated Large Language Models to improve natural language understanding and response accuracy between healthcare professionals and robots.
- **Collaborative Research**: Worked with multidisciplinary teams, including shadowing medical staff at NewYork-Presbyterian/Weill Cornell Medicine to align technological solutions with real-world needs.

Universidad de los Andes — Bogotá, Colombia
Teaching Assistant - Algorithm Design and Analysis — *Jan 2022 – Dec 2022*

- **Teaching Assistance**: Assisted in grading assignments, clarifying students' doubts, and providing supplementary lessons to reinforce understanding of algorithms and data structures, ensuring students grasped problem-solving techniques and algorithmic concepts.

Universidad de los Andes — Bogotá, Colombia
Secondary Professor - Differential Calculus — *Jan 2024 – Jun 2024*

- **Course Instruction**: Instructed a class of approximately 30 students in Differential Calculus, developing course materials and assessments to enhance understanding and application of key mathematical concepts.

Universidad de los Andes — Bogotá, Colombia
Robocol - Robotics Group Member — *Feb 2021 – Aug 2022*

- **Computer Vision and Team Collaboration**: Worked on image processing algorithms and deep learning models (YOLO, CNNs) for computer vision tasks in the Vision Subsystem; collaborated on robotics competitions and projects, enhancing teamwork and technical skills.

PROJECTS

- **Integrated Communication Framework for Healthcare Robotics**: Contributed to the development of an interface designed to connect with a crash cart, aiming to assist healthcare workers in emergency situations. Conducted user tests to evaluate the interface's effectiveness and worked on integrating semi-autonomous control for the robot in a 'Wizard of Oz' setup.
- **Plain Language Text Generation and Detection**: Developed linguistic analyses using statistical methods and NLP tools in Python to identify variables determining the simplicity of biomedical texts; constructed classification models and tested prompts using LLMs to generate plain language versions from professional texts.
- **Generative Models for Quasar Spectra Data**: Trained Variational Autoencoders (VAEs) to generate quasar spectra data, collaborating on data preprocessing, model training, and evaluation; gained experience in unsupervised learning and generative modeling techniques.
- **DevSavant Contest - Project Analyzer Using LLMs**: Collaborated with a team to develop a project analyzer utilizing GPT-3.5 API; learned LangChain and prompt engineering strategies like few-shot and zero-shot learning, enhancing skills in integrating LLMs into practical applications.