Joseph **Gallego**

PHD COMPUTER SCIENCE (ARTIFICIAL INTELLIGENCE) · CTO MUNKYS GROUP INC

Newark, Delaware

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🎓 Joseph Gallego

"We are able to respect and accept differences."

Profile

I am the software engineering manager of Munkys Group INC. It is an international company with a presence in US, Colombia, Chile, Peru among others. Currently, I develop applications where there is a broad component of computing engineering, cyber-security, statistics, and industrial engineering, using principles of Lean Manufacturing and statistics for software development. I am passionate about programming and the use of free technologies for the rapid development of web and mobile applications. Leader, with aptitudes and skills to work in a team, take responsibility, create a commitment, and of course, always be willing to change. I am interested in generating new knowledge. I teach both programming and artificial intelligence, one of the activities that I enjoy the most.

PostDoc in machine learning and remote sensing. PhD in computer science. Master in Systems Engineering from the National University of Colombia. Researcher in the area of computer science. Participant in secondary education in systems olympiads at the Universidad Antonio Nariño at national level. Student associated with the MindLab research group at the National University of Colombia, Bogotá, conducting research in Machine Learning.

Education

Frontier Development Lab - NASA - ESA
US - Europe

POSTDOC MACHINE LEARNING RESEARCH
June. 2023 - Dec. 2024

- Development of Worldwide machine learning foundational response models.

National University of Colombia
Bogotá, Colombia

PHD WITH MERITORIOUS DISTINCTION IN SYSTEMS AND COMPUTING ENGINEERING
Jul. 2019 - Jun. 2023

- Grade point average 3.9 out of 4.0.
- Teaching assistant scholarship.

Deep.AI
Bogotá, Colombia

SPECIALIZATION IN DEEP LEARNING
Jan. 2020 - Dec. 2020

- 6 Courses approved in deep learning.
- Coursera platform.

National University of Colombia
Medellín, Colombia

MASTER'S DEGREE IN SYSTEMS ENGINEERING AND COMPUTER SCIENCE
Jan. 2014 - Dec. 2016

- Grade point average 3.88 out of 4.0.
- Teaching assistant scholarship.
- Young Researcher.

National University of Colombia
Bogotá, Colombia

SYSTEMS AND COMPUTER ENGINEERING
Jan. 2008 - Dec. 2013

- Grade point average 3.74 out of 4.0.
- Winner of "mejores saber pro".
- Part of the Dean List every semester.
- Third place in graduation in systems and computer engineering.

National University of Colombia
Bogotá, Colombia

INDUSTRIAL ENGINEERING
Jan. 2008 - Dec. 2013

- Grade point average 3.66 out of 4.0.
- Winner of "mejores saber pro".
- Part of the Dean List every semester.
- First place in industrial engineering graduation.

Center Technician Institute of La Salle
Bogotá, Colombia

INTERMEDIATE EDUCATION - SYSTEMS TECHNICIAN
Jan. 2003 - Dec. 2007

- Best student in school.
- Participant and winner of systems and computer olympiads.

Papers

Latent Anomaly Detection Through Density Matrices

Joseph A Gallego, Oscar A Bustos, Fabio A González   *2024*

- This paper introduces a novel anomaly detection framework that combines the robust statistical principles of density-estimation-based anomaly detection methods with the representation-learning capabilities of deep learning models. The method originated from this framework is presented in two different versions: a shallow approach employing a density-estimation model based on adaptive Fourier features and density matrices, and a deep approach that integrates an autoencoder to learn a low-dimensional representation of the data.

INQMAD: Incremental Streaming Anomaly Detection with Density Matrices, Quantum Measurement and Density Estimation

Joseph A Gallego, Oscar A Bustos, Fabio A González   *2024*

- In our research, we propose a novel method for streaming anomaly detection based on incremental density estimation. The method uses random Fourier features and incorporates the principles of quantum measurements and density matrices. We present the definition of the method and a variant of it, that can be resembled as an exponential moving average density and a simple moving average, respectively. The method is designed to handle potentially infinite data streams and has a constant update complexity of $O(1)$.

Exploring DINO: Emergent Properties and Limitations for Synthetic Aperture Radar Imagery

Joseph A. Gallego-Mejia, Anna Jungbluth, Laura Martínez-Ferrer, Matt Allen, Francisco Dorr, Freddie Kalaitzis, Raúl Ramos-Pollán   *2023*

- Self-supervised learning (SSL) models have recently demonstrated remarkable performance across various tasks, including image segmentation. This study delves into the emergent characteristics of the Self-Distillation with No Labels (DINO) algorithm and its application to Synthetic Aperture Radar (SAR) imagery. - Click Here - Research Gate

Fewshot learning on global multimodal embeddings for earth observation tasks

Matt Allen, Francisco Dorr, Joseph A Gallego-Mejia, Laura Martínez-Ferrer, Anna Jungbluth, Freddie Kalaitzis, Raúl Ramos-Pollán   *2023*

- In this work we pretrain a CLIP/ViT based model using three different modalities of satellite imagery across five AOIs covering over 10% of the earth total landmass, namely Sentinel 2 RGB optical imagery, Sentinel 1 SAR amplitude and Sentinel 1 SAR interferometric coherence. Click here - Research Gate

Exploring Generalisability of Self-Distillation with No Labels for SAR-Based Vegetation Prediction

Laura Martínez-Ferrer, Anna Jungbluth, Joseph A Gallego-Mejia, Matt Allen, Francisco Dorr, Freddie Kalaitzis, Raúl Ramos-Pollán   *2023*

- In this work we pre-train a DINO-ViT based model using two Synthetic Aperture Radar datasets (S1GRD or GSSIC) across three regions (China, Conus, Europe). We fine-tune the models on smaller labeled datasets to predict vegetation percentage, and empirically study the connection between the embedding space of the models and their ability to generalize across diverse geographic regions and to unseen data. - Click Here - Research Gate

Large Scale Masked Autoencoding for Reducing Label Requirements on SAR Data

Matt Allen, Francisco Dorr, Joseph A Gallego-Mejia, Laura Martínez-Ferrer, Anna Jungbluth, Freddie Kalaitzis, Raúl Ramos-Pollán   *2023*

- In this work, we apply a self-supervised pretraining scheme, masked autoencoding, to SAR amplitude data covering 8.7% of the Earth's land surface area, and tune the pretrained weights on two downstream tasks crucial to monitoring climate change - vegetation cover prediction and land cover classification. We show that the use of this pretraining scheme reduces labelling requirements for the downstream tasks by more than an order of magnitude, and that this pretraining generalises geographically, with the performance gain increasing when tuned downstream on regions outside the pretraining set. - Click Here - Research Gate

Quantum Kernel Mixtures for Probabilistic Deep Learning

Fabio A González, Raul Ramos, Joseph A Gallego   *2023*

- This paper presents a novel approach to probabilistic deep learning (PDL), quantum kernel mixtures, derived from the mathematical formalism of quantum density matrices, which provides a simpler yet effective mechanism for representing joint probability distributions of both continuous and discrete random variables. - Click Here - Research Gate

DEMANDE: Density Matrix Neural Density Estimation

Joseph A Gallego, Fabio A González   *2023*

- This paper presents a novel method for neural density estimation based on density matrices and adaptive Fourier features. Density matrices are commonly used in quantum mechanics to represent the quantum state of a physical system. - Click Here - Research Gate

Learning with Density Matrices and Random Features

Fabio A González, Joseph A Gallego, Santiago Toledo-Cortés, Vladimir Vargas-Calderón   *2022*

- This paper explores how density matrices can be used as a building block to build machine learning models exploiting their ability to straightforwardly combine linear algebra and probability. Quantum Machine Intelligence - Click Here - Research Gate

Computing expectation values of density matrices for quantum anomaly detection

Diego H. Useche, Oscar A. Bustos-Brinez, Joseph A. Gallego, Fabio A. González   *2022*

- This paper explores how density matrices can be used as a building block to build machine learning models exploiting their ability to straightforwardly combine linear algebra and probability. Arxiv Link - Click Here - Research Gate

Fast Kernel Density Estimation with Density Matrices and Random Fourier Features

Ibero-American Conference on Artificial Intelligence

JOSEPH A GALLEGO, JUAN F OSORIO, FABIO A GONZÁLEZ · 2022

- In this paper, we systematically evaluate the novel DMKDE algorithm and compare it with other state-of-the-art fast procedures for approximating the kernel density estimation method on different synthetic data sets. Ibero-American Conference on Artificial Intelligence - Click Here - Research Gate

Anomaly Detection through Density Matrices and Kernel Density Estimation (AD-DMKDE)

LatinX Workshop in Neurips 2022

OSCAR A BUSTOS, JOSEPH A GALLEGO, FABIO A GONZÁLEZ · 2022

- This paper presents a novel density estimation method for anomaly detection using density matrices (a powerful mathematical formalism from quantum mechanics) and Fourier features. Neurips 2022 LatinX Workshop - Click Here - Research Gate

InQMeasurement: Incremental Quantum Measurement Anomaly Detection

ICDM

JOSEPH A GALLEGO, OSCAR A BUSTOS, FABIO A GONZÁLEZ · 2022

- We present a new incremental quantum measurement anomaly detection method based on Fourier features and density matrices. The IEEE International Conference on Data Mining (ICDM) - Click Here - Research Gate

LEAN-DMKDE: Quantum Latent Density Estimation for Anomaly Detection

AAAI

JOSEPH A GALLEGO, OSCAR A BUSTOS, FABIO A GONZÁLEZ · 2023

- The method combines an autoencoder, for learning a low-dimensional representation of the data, with a density-estimation model based on random Fourier features and density matrices in an end-to-end architecture that can be trained using gradient-based optimization techniques. Arxiv - Click Here- Research Gate

Risk Automatic Prediction for Social Economy Companies using Camels

WEA

JOSEPH A GALLEGO, DANIELA MARTIN V, FABIO A GONZÁLEZ · 2022

- We proposed a prediction model based on a machine learning approach. The method was trained with the random forest algorithm with historical data provided by each SEE. Three consecutive periods of data were concatenated. WEA - Click Here - Research Gate

MLOps (Machine Learning Dev Ops)

ACIS

JOSEPH A GALLEGO, FABIO A GONZÁLEZ · 2022

- Data analytics and machine learning are changing every aspect of our lives today. Activities that were once performed entirely by humans such as disease detection, object detection, speech recognition and synthesis, among others, are now being automated using machine learning algorithms. https://sistemas.acis.org.co/index.php/sistemas/article/view/205

National Survey "Machine Learning Operations and its implementation challenges in Colombia"

ACIS

JOSEPH A GALLEGO, FABIO A GONZÁLEZ · 2022

- Data analytics and machine learning are changing every aspect of our lives today. Activities that were once performed entirely by humans such as disease detection, object detection, speech recognition and synthesis, among others, are now being automated using machine learning algorithms. https://sistemas.acis.org.co/index.php/sistemas/article/view/205

Robust kernels for robust location estimation

Neurocomputings 429, 174-186

JOSEPH A GALLEGO, FABIO A GONZÁLEZ, OLFA NASRAOUI · 2021

- This paper shows that least-square estimation (mean calculation) in a reproducing kernel Hilbert space (RKHS) F corresponds to different M-estimators in the original space depending on the kernel function associated with F. Neurocomputings - Click Here - Research Gate

Robust Estimation in Reproducing Kernel Hilbert Space

Neurips 2023 LatinX Workshop

JOSEPH A GALLEGO, FABIO A GONZÁLEZ, OLFA NASRAOUI · 2019

- Our work shows that estimating the mean in a feature space induced by certain kinds of kernels is the same as doing a robust mean estimation using an M-estimator in the original problem space - Click Here - Research Gate

Work Experience

Munkys Group Inc
Software and Machine Learning Engineer Manager

Wilmington, US

01/2012 - 07/2024

- Create a full machine learning pipeline using PyTorch and Pytorch Lightning for Generative AI using stable diffusion models and large language models for quality texture generated images which are used by 10k users.
- Create a Spring Boot application for manufacturing enterprises supporting 10k mobile devices users with 10M transactions each hour, using PostgreSQL, RabbitMQ and redis.
- Create 10 android applications using Java and Kotlin that supports 10k users. The applications has several usecases such as maintenance, quality, production, messages, payroll, biometric.
- Create a triplet network to improve the human recognition of the employees, improving the accuracy by 20% and reducing the inference time by 15%
- Create a React Application that supports 10 different applications and 10K users, using realtime communication with RabbitMQ.
- Create a hybrid infrastructure using docker, docker compose, and kubernetes to support 10k users using a hybrid infrastructure. This achived a cost reduction of 60% compared to the traditional virtual machine cloud setting.
- Lead a team of 8 developers and designers to create 10 applications using Scrum, with dealy meetings. Supporting, encourage, and solving their problems.
- Creator and developer of production software with mobile devices and IOT.
- Has designed databases, both SQL (Postgresql) and No-SQL (MongoDb
- Has led the programming group using SCRUM methodology with 15-day sprints.
- Has created machine learning models for classification, regression, anomaly detection tasks, among others.
- Has created machine learning models for clustering tasks.
- Has created machine learning pipelines using Tensorflow and Pytorch.
- Has used MLflow and Weights&Biased for logging the models.
- Has used Hydra to make the configuration of the models.
- Has developed Front-End applications using technologies such as CSS, HTML, HTML5, Javascript, AngularJs, Angular7 and React.
- Has developed Backend applications using technologies such as Java, Spring Boot, Jhipster, Flask among others.
- Has developed mobile applications on native Android with Java and Kotlin.
- Has used communication technologies between microservices with asynchronous communication with Apache Kafka.
- Has implemented databases. Performed entity-relationship model generation for several of our products.
- Has performed analysis of quantitative data generated from the Sammu application (use of tools such as linear regression, logistic regression, multifactor analysis, clustering, graphical report generation, classification).
- Participated in the construction, elaboration and subsequent analysis of Sammu customer satisfaction surveys.
- Processing of the information collected and generated by the Sammu application.
- Used different descriptive statistics tools to generate graphical reports for our clients.
- Use of computational learning tools to extract information from the data generated by Sammu customers.
- Generation of technical documents used by our developers.
- In charge of leading and supervising the weekly meetings held by the development team, where documents are generated.
- **Contact**: Daniela Martin - **Phone**: +1 302 513 5600

Trillium - Frontier development lab - ESA - NASA
Postdoc: Machine Learning Researcher

US - Europe

06/2023 - 07/2024

- Create machine learning pipeline using self-supervised learning on satellite images and improve the state of the art methods on 5% of accuracy
- Collaborate with 7 machine learning researches to create new self Clip supervised machine learning methods to improve by 10 percent state of the art methods in vegetation and biomass estimation
- Create a mask autoencoder algorithm to improve land cover classification using self-supervised learning methodology and improve by 7% the state-of-the-art-methods
- Present the results to a large audience of experts in 10 minutes showing the principal results obtained by the team
- Create a PyTorch lightning dataloader and dataset to ingress a variety of satellite images with different modalities using Geopandas, XArray and Dask and improve the reading time by 50% using Blosc compression.
- Use of model versioning with Hydra
- Using Google Cloud Platform for training using GPUs
- Using Nvidia's DGX for multi-gpu and distributed multi-gpu training
- Reading and implementing state-of-the-art models
- Daily work progress meetings
- Use of git for code versioning
- Use of best development practices
- **Contact**: Anne Jungbluth - **Email**: anne@trillium.tech

National University of Colombia
Computer Programming

Bogotá, Colombia

08/2022 - 07/2023

- Preparation of master classes, tests and activities.
- Evaluation and grading of midterm exams.
- Contact: Luis Fernando Niño - Phone: +57 300 269 3300

Comware

Bogotá, Colombia

KNOWLEDGE TRANSFER LECTURER IN THE PROJECT DEVELOPMENT OF THE PREDICTIVE MODEL OF CRIME FOR THE CRIMINAL

12/2021 - 01/2022

ANALYSIS CENTER OF THE CRIMINAL INVESTIGATION DEPARTMENT AND INTERPOL

- Pedagogical design, construction of educational content, planning and execution of the knowledge transfer program. execution of the knowledge transfer program
- Pedagogical design, construction of educational content, planning and execution of the sessions and workshops of the machine learning module in the knowledge transfer program.
- Elaboration of the instructional scripts and approach of the learning activities based on the competency map and what is described in the syllabus.
- Design of the activities to be developed in a synchronous distance, active-participative and demonstrative-explanatory way, by means of strategies of adoption and use of emerging technologies that incorporate methodologies of learning-by-doing and application of knowledge to problems and cases of the real environment, making use of the concepts and best practices acquired in the development of these experiences.
- Ensure that the knowledge transfer program is developed on the basis of meaningful learning experiences for participants, integrating at least, the following activities: - Guided workshops and discussion groups. - Virtual content, video tutorials and learning capsules. - Simulation and evaluation of real cases and contextual problems.
- Conducting the keynote lectures for the four sessions that make up the machine learning module.
- Contact: Comware - Phone: +57 1 638 21 00

National University of Colombia

Bogotá, Colombia

TEACHING SUPPORT FOR "MACHINE LEARNING AND BIG DATA" DIPLOMA COURSE

08/2019 - Present

- Support to the teacher in teaching activities.
- Grading of assignments, assignments and projects.
- Development and remote face-to-face teaching.
- Contact: Fabio Gonzalez - Phone: +57 300 2693621

Etraining

Bogotá, Colombia

MACHINE LEARNING MODULE LEADER AND EXPERT IN CHARGE OF THE SESSIONS

09/2021 - 10/2021, 05/2022 - 10/2022

- Pedagogical design, construction of educational content, planning and execution of the knowledge transfer program.
- Perform the pedagogical design, content construction, planning and execution of the sessions and workshops of the machine learning module in the program for knowledge transfer in BLOCKCHAIN AND DATA ANALYTICS FOR DIGITAL INDUSTRY.
- Development of the instructional scripts and approach of the learning activities based on the competency map and what is described in the syllabus.
- Design of the activities to be developed in a synchronous distance, active-participative and demonstrative-explanatory manner, through strategies of adoption and use of emerging technologies that incorporate learning-by-doing methodologies and application of knowledge to problems and cases of the real environment, making use of the concepts and best practices acquired in the development of these experiences.
- Ensure that the knowledge transfer program is developed on the basis of meaningful learning experiences for participants, integrating at least, the following activities: - Guided workshops and discussion groups - Virtual content, video tutorials and learning capsules - Simulation and evaluation of real cases and contextual problems
- Support in the development of the sessions for the execution of the knowledge transfer to the 220 beneficiary companies through the EN-SÉÑAME platform provided by Etraining, in the topics under its responsibility. Consequently: - Conducting the master lectures for the four sessions that make up the machine learning module - Participating in the development of information collection instruments to beneficiary companies - Delivering inputs for reports
- Delivery of inputs for the diagnostic reports prepared by Etraining on the beneficiary companies of the program in the topics under its responsibility according to the guidelines given by the person in charge delegated by Etraining for the preparation of the final report, as follows: - Participation in the structuring of instruments to identify opportunities for the application of machine learning in the value chain of each company - Participation in the structuring of instruments to identify opportunities for the application of machine learning in the business model - Review and analysis of information presented by the companies with initiatives for application on the value chain and business model.
- Contact: Alexandra Hernández - Phone: +57 310 6899 9867

National University of Colombia

Bogotá, Colombia

DATA STRUCTURES TEACHER

08/2020 - 06/2022

- Preparation of master classes, tests and activities.
- Evaluation and grading of midterm exams.
- Contact: Luis Fernando Niño - Phone: +57 300 269 3300

National University of Colombia

Bogotá, Colombia

CREATION OF MATERIAL FOR AGILE METHODOLOGIES AND MACHINE LEARNING COURSE

08/2021 - 12/2021

- Development of interactive material, presentations, workshops, projects, among others.
- Contact: Fabio Gonzalez - Phone: +57 300 2693621

National University of Colombia - Colombian Technology Minister

Bogotá, Colombia

COMPUTER PROGRAMMING AND SOFTWARE DEVELOPMENT LECTURER

08/2021 - 12/2021

- To provide professional services as a specific trainer cycle 1 and 2 in the framework of the inter-administrative agreement of the inter-administrative agreement No 782 of 2021, teaching classes in the languages Python and Java. Python and Java
- Provide professional services as facilitator 1 level - cycle ii and iii in the framework of the project "contract for the provision of professional services as facilitator 1 level - cycle ii and iii in the framework of the project of the project "service provision contract no 0246 of 2020 subscribed between the Tecnalia Colombia Foundation and the national university of colombia".
- Contact: Juan Carlos Torres Phone: +57 300 372 3702

National University of Colombia - General Comptroller's Office of the Republic *Bogotá, Colombia*

Natural Language Processing Lecturer *08/2021 - 12/2021*

- To provide professional services as a lecturer within the framework of the project "inter-administrative contract 374 of 2020 subscribed between the comptroller general's office de la republica y la universidad nacional de colombia"
- OSE No. 2409 de 2020 Empresa QUIPU: 2018 - 01/12/2020 a 10/12/2020
- Contact: Felipe Restrepo - Phone: +57 304 5762504

National University of Colombia - Supersolidaria *Bogotá, Colombia*

Development of a machine learning system for Supersolidaria *08/2021 - 12/2021*

- Professional services to support machine learning analytics and solution development of the development of solutions of the Supersolidaria's Think Tank in the framework of the the framework of the project called "Structuring of a thinking center in solidarity economics in solidarity economy"
- Contact: Hernan Ceballo - Phone: +57 312 5035901

National University of Colombia *Medellín, Colombia*

Programming fundamentals lecturer *07/2015 - 05/2016*

- Preparation of master classes, quizzes and activities.
- Evaluation and grading of midterms.

Minciencias - National University of Colombia *Bogotá, Colombia*

Young Researcher *01/2014 - 12/2015*

- Development of an artificial intelligence system for video
- Contact: Fabio Augusto González Phone: +57 300 269 36 21

Munkys SAS *Bogotá, Colombia*

Administrative and Financial General Manager *01/2007 - 12/2011*

- Contact: Ilda María Mejía Duque Phone: +57 320 451 92 28

National University of Colombia *Bogotá, Colombia*

Office Assistant *01/2010 - 06/2010*

- Computer maintenance, software installation, software update.

Software

Incremental Anomaly Detection using Quantum Measurements *US*

Learning with Density Matrices and Random Fourier Features *2022*

- Github: https://github.com/Joaggi/Incremental-Anomaly-Detection-using-Quantum-Measurements

LEAN-DMKDE: Quantum Latent Density Estimation for Anomaly Detection *US*

Learning with Density Matrices and Random Fourier Features *2022*

- Github: https://github.com/Joaggi/qaddemadac

Anomaly Detection with Density Matrix Kernel Density Estimation *US*

Learning with Density Matrices and Random Fourier Features *2022*

- Github: https://github.com/Joaggi/anomaly-detection-density-matrix-kernel-density-estimation

Fast Kernel Density Estimation *US*

Learning with Density Matrices and Random Fourier Features *2021*

- Github: https://github.com/Joaggi/Fast-Kernel-Density-Estimation-with-Density-Matrices-and-Random-Fourier-Features

Quantum Measurement Classification *US*

Learning with Density Matrices and Random Fourier Features *2021*

- Github: https://github.com/fagonzalezo/qmc

Robust Estimation in Reproducing Kernel Hilbert Space *Bogota, Col*

Robust Kernels *2019*

- Github: https://github.com/Joaggi/Robust-kernels-for-robust-location-estimation

Undergraduate Thesis *Bogota, Col*

Prototype of a Distributed Language for Agents *2013*

- Github: https://github.com/Joaggi/Prototype-of-a-distributed-language-for-agents

Posters

NeurIPS 2023 *New Orleans, USA*

Exploring DINO: Emergent Properties and Limitations for Synthetic Aperture Radar Imagery *Dec. 2023*

- Presentation of research in self-supervised learning
- Winner of travel award to present work

NeurIPS 2023 *New Orleans, USA*

Fewshot learning on global multimodal embeddings for earth observation tasks *Dec. 2023*

- Presentation of research in self-supervised learning

NeurIPS 2023 *New Orleans, USA*

Exploring Generalisability of Self-Distillation with No Labels for SAR-Based Vegetation Prediction *Dec. 2023*

- Presentation of research in self-supervised learning

NeurIPS 2023 *New Orleans, USA*

Large Scale Masked Autoencoding for Reducing Label Requirements on SAR Data *Dec. 2023*

- Presentation of research in self-supervised learning

Association for the Advancement of Artificial Intelligence AAAI 2023 *Washington DC, USA*

LEAND: Quantum Latent Density Estimation for Anomaly Detection (Student Abstract) *Feb. 2023*

- Presentation of research in anomaly detection
- Winner of travel award to present work

Association for the Advancement of Artificial Intelligence AAAI 2023 *Washington DC, USA*

Doctoral Consortium *Feb. 2023*

- Presentation of doctoral research

LatinX in AI Research Workshop co-located with the Thirty-Third Neural Information Processing Systems (NeurIPS) *New Orleans, USA*

Anomaly Detection through Density Matrices and Kernel Density Estimation (AD-DMKDE) *Nov. 2022*

- Presentation of research in anomaly detection
- Winner of travel award to present work

LatinX in AI Research Workshop co-located with the Thirty-Third Neural Information Processing Systems (NeurIPS) *Vancouver, Canada*

Robust Estimation in Reproducing Kernel Hilbert *Dic. 2019*

- Presentation of research in robust estimation
- Winner of travel award to present work

Fundación COPEC-UC - International Seminar on Artificial Intelligence *Sant. de Chile, Chile*

Robust Estimation in Hilbert and Krein Spaces with Reproducing Kernel *Nov. 2018*

- Presentation of master's thesis in research seminar on artificial intelligence

Honors and medals

2023	**Selected as one of the researcher for developing generalizable SAR image method**, Frontier Development Lab sponsorship by NASA and ESA	*Europe*
2020	**Selected as one of the 17 best entrepreneurs of Colombia**, Young Leaders of the Americas Initiative fellowship	*U.S.A*
2018	**Generation 20 extension winner**, Start-Up Chile	*Chile*
2018	**Generation 20 winner**, Start-Up Chile	*Chile*
2014	**Third place graduation in computer and systems engineering**, Universidad Nacional de Colombia	*Bogotá, Colombia*
2014	**First place industrial engineering graduation**, Universidad Nacional de Colombia	*Bogotá, Colombia*
2013	**Best Saber Pro in Computer and Systems Engineering**, Colombian Higher Education Examination	*Bogotá, Colombia*
2013	**Best Saber Pro Industrial Engineering**, Colombian Higher Education Examination	*Bogotá, Colombia*
2006	**2do Puesto**, National Programming Olympics	*Bogotá, Colombia*
2005	**4to Puesto**, National Programming Olympics	*Bogotá, Colombia*
2007	**Best student of the whole school**, Instituto tecnico central de la Salle	*Bogotá, Colombia*

Skills

MlOps	MlFlow, DVC, PyTorch, Tensorflow, Jax, Keras, Sklearn, Pandas, Numpy, Matplotlib, Seaborn, PyPlot, Linux
DevOps	Google Cloud, AWS, Docker, Kubernetes, Terraform, Jenkins, Git
Back-end	SpringBoot, Spring Framework, FastAPI, Flask, Django, REST API, R, Matlab
Databases	PostreSQL, MySQL, MongoDB, Cassandra, HBase, SQlite, SqlAlchemy, Datastore, Hadoop, PySpark
Front-end	React, Redux, HTML5, LESS, SASS, Javascript, Angular, AngularJs
Programming	Python, JAVA, Javascript, Kotlin, C, C++, Matlab, LaTeX, Visual Basic
Languages	Spanish (Nativo), English (C2), French (B2), Italian(A1)

Program Committee

2021	**Jury**, Digital Entrepreneurship Incubator - Colombo Americano	*Bogotá, Colombia*
2020	**Mentor**, Entrepreneurship Program - Innovation Center Faculty of Engineering University of Santiago de Chile	*Sant. de Chile, Chile*
2018	**Mentor and Jury**, Entrepreneurship Program - GearBox	*Sant. de Chile*

Extracurricular Academic Activities

2020	**Machine Learning**, How to win a Kaggle competition	*Coursera*
2020	**Machine Learning**, Improving Deep Neural Networks	*Coursera*
2020	**Software Development**, Front-End Web Ui Frameworks and Tools: Boostrap 4	*Coursera*
2020	**Machine Learning**, Bayesian Statistics: From Concepts to Data Analysis	*Coursera*
2020	**Machine Learning**, Sequence Model	*Coursera*
2020	**Machine Learning**, Convolutional Neural Networks	*Coursera*
2020	**Machine Learning**, Structuring Machine Learning Projects	*Coursera*
2020	**Machine Learning**, Neural Networks and Deep Learning	*Coursera*
2019	**Software Development**, Kotlin for Java Developers	*Udemy*
2019	**Machine Learning**, Curso de reinforcement learning dictado por Microsoft	*Edx*
2016	**Machine Learning**, The analitic edge	*Coursera*
2016	**Software Security**, Software Security	*Coursera*
2016	**Software Security**, Usable Security	*Coursera*
2015	**Software Development**, Software process and agile practices	*Coursera*
2015	**Machine Learning**, The Data Scientist's Toolbox	*Coursera*
2015	**Machine Learning**, Pattern Discovery in Data Mining	*Coursera*
2014	**Machine Learning**, Massive Data Mining	*Coursera*
2013	**Machine Learning**, Machine Learning	*Coursera*
2013	**Machine Learning**, Learning from data	*Edx*
2013	**Machine Learning**, Introduction to statistics	*Edx*
2013	**Machine Learning**, Introduction to Statistics	*Coursera*
2013	**Computer Science**, Introduction to Theoric computation	*Udacity*
2012	**Machine Learning**, Model thinking	*Coursera*
2011	**Universidad Nacional De Colombia**, Italian language elective course	*Bogotá, Colombia*
2011	**Language**, English iTEP international test test of english proficiency Certificate level B2	*Bogotá, Colombia*
2011	**Language**, English level B2 T&T teaching and tutoring college of colombia	*Bogotá, Colombia*
2005	**Instituto Técnico Central de la Salle**, III mathematics meeting Liceo Brother Miguel de la Salle	*Bogotá, Colombia*