Valentina Roquemen Echeverri

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Phone: +57 322 619 4547   **Citizenship**: Colombia

Research interests	Development of computational methods for data-driven modeling, medical data analysis, machine learning and its applications to healthcare.

Education

Universidad de Antioquia   Medellín, Antioquia

BSc Physics   April 2015 – Present

Mentors: Clara Mosquera-Lopez, Ph.D., Prof. Jorge Mahecha

GPA: 4.46/5.0

Note: Highest grade: 5.0. Passing grade: 3.0.

Honors and awards

Best Advanced Student in the Physics Program for 2020. (Universidad de Antioquia)	2020
Dean's List for the Term 2019-1 (Universidad de Antioquia)	2019
Dean's List for the Term 2017-2 (Universidad de Antioquia)	2017
Dean's List for the Term 2017-1 (Universidad de Antioquia)	2017
Valedictorian (Colegio La Presentación Envigado)	2014

Research experience

Telluscope Project

Mentors: Dr. Clara Mosquera-Lopez (OHSU)   December 2020 – Present

Objective: To develop new algorithms for detection and classification of abnormal heart sounds using acoustic data collected from a digital stethoscope.

Results: An AI-powered tool for automatic heart sound quality assessment and segmentation. Our segmentation method distinguishes S1/S2 heartsounds with an area under the curve (AUC) of 97.1%. One paper under review for publication in the 2021 IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM 2021)

Grupo de Óptica y Fotónica

Mentors: Dr. Edgar A. Rueda (Universidad de Antioquia)   September 2018 – November 2020

Objective: To detect imperfections in GEM foils using diffraction patterns analysis and machine learning tools.

Results: A neural network that performs a binary classification of diffraction patterns of simulated GEM foils. The network has a validation accuracy of 90%.

Grupo de Óptica y Fotónica

Mentors: Dr. Edgar A. Rueda (Universidad de Antioquia)   June 2018 – March 2020

Objective: To demonstrate experimentally a new physical principle that explains interference without using wave superposition.

Results: A device that allows measuring the diffraction pattern of microwaves.

Poster · ***Estudio de técnica de difracción para la determinación de imperfecciones en Gas Electron Multipliers***   November 2019

XVI Encuentro Nacional de Óptica y VII Conferencia Andina y del Caribe en Óptica y sus Aplicaciones (ENO – CANCOA 2019)

Additional education · **Techniques in Artificial Intelligence II**   August 2018 – November 2018

Introduction to Machine Learning.

Multi-layer Perceptron, Convolutional Neural Networks and Recurrent Neural Networks, using Tensorflow.

Techniques in Artificial Intelligence I   February 2018 – June 2018

Mathematics and conceptual basis for Machine Learning theory.

Basic Neural Networks building (perceptron).

Management and database analysis using Scikit-learn.

Techniques for Physical Sciences IV   August 2017 – November 2017

Parallel programming for high performance computing (OpenMP, MPI, CUDA C).

Techniques for Physical Sciences II   February 2017 – June 2017

VPython introduction.

Basic simulations on Blender.

Parallel computing introduction using CUDA C.

Techniques for Physical Sciences I   February 2016 – June 2016

Arduino encoding introduction.

Statistics basic concepts for data analysis.

Webpage encoding oriented to databases.

Industry experience · **CNV Construcciones,** *Área Control Gestión*   Medellín, Antioquia

Auxiliar Control Gestión   April 2021 - Present

Data science and process automation.

Developed an algorithm to automatically process emails describing construction tenders according to relevance. The company receives about 200 of such emails weekly. This was previously processed by a employee who spent 5 minutes reading and raking each email, and now, the algorithm processes the entire inbox in a matter of minutes.

Skills

Programming
Proficient in: Python, LaTeX, Arduino, C++, and C.
Familiar with: CUDA C, PHP.

Languages
Spanish (native), English (advanced)

Service and outreach

Colectiva FEMCEN   August 2021 – Present
This collectivity aims to promote the study of science by women. In particular, I helped to design a programming module in python language, and I taught a workshop in Pandas (Python's library).

OSA Student chapter   November 2018 – September 2021
of the Universidad de Antioquia
The chapter organized activities to divulge optics to people that do not have access to scientific knowledge, kids in particular.

Professional memberships

Sociedad Red Colombiana de Optica   September 2019 – September 2021
Attended the XVI Encuentro Nacional de Óptica y VII Conferencia Andina y del Caribe en Óptica y sus Aplicaciones (ENO – CANCOA 2019)

Extracurricular projects

Real-time car detection with plate detection   December 2019
Real-time car detection with license plate number detection.
Jetson TX2 and Foscam FI9800P camera were used as hardware.

Other interests

Trekking, cooking, and crafting