

Juan Camilo Vasquez-Correa,

Data Science, Machine Learning, Research, Development, Innovation

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📍 Medellín, Colombia

I have performed research and development activities in aspects related to data science and machine learning for health-care, security, and business applications during more than eight years. I am the head of research, development, and innovation at [Pratech group](#). My expertise spans machine learning, deep learning, and analysis of time-series such as audio, natural language, and those coming from a variety of sensors to model especially human behavior and consumer habits. Thanks to my interdisciplinary background, I have successful record of accomplishments in both industry and academia. My background involves the application of machine learning methods to analyze signals such as speech, handwriting, gait, energy consumption, and natural language to monitor and to detect different human traits like emotions, personality, health-states, consumer habits, among others. I have supervised as well several projects regarding the designing and development of machine learning technologies for different applications such as biometric identification, health-care modeling, and business document analysis, using information from speech, text documents, facial expression, keystroke dynamics, among others.

I am an expert on several frameworks including the standard SciPy Stack (Numpy, SciPy, Pandas, Scikit-Learn, Matplotlib), Tensorflow, Pytorch, Kaldi, Spacy, among others designed for machine learning, natural language processing, and time-series modeling.

Experience

Head of R&D&i, Pratech group, Colombia 2021–Present
Research activities related to development of natural chatbot systems and intelligent document analysis. Leading Data science projects. Leading research and innovation strategies for new product development.

Staff Researcher, Pattern recognition Lab (LME), Friedrich Alexander Universität Erlangen-Nürnberg, Germany 2018–Present
Research activities related to machine learning to model human traits from speech, handwriting, gait, and natural language. (see <https://lme.tf.fau.de/person/vasquez/>).

Lecturer, Dep. of Electronics and Telecommunications Engineering, University of Antioquia, Colombia 2016–2020
Teaching of the Bachelor course digital signal processing.

Full-stack developer and Machine Learning Engineer, Brandon Logan 2017
Development of products using AI technologies for the graphic design industry. Development of computer vision and machine learning algorithms for image analysis and recommender systems.

Software developer, Faculty of Engineering, University of Antioquia, Colombia 2016
Development of the NeuroSpeech software (see [Software](#) below). to evaluate the speech production of patients with Parkinson's disease

Graduate Visiting Scholar, Johns Hopkins University, Baltimore, USA 2016
Member of a research team in the 2016 Jelinek Memorial Summer Workshop on Speech and Language Technologies (see [JSALT2016](#)).

Intern Researcher, Telefónica Research, Barcelona, Spain 2015
Research and development of speech processing algorithms to work in noisy conditions to detect paralinguistic traits in humans.

Projects

ML energy, Colombian Ministry of Science, [IEB Colombia](#), [UPME Colombia](#) 2020
Development of machine learning methods to analyze and to characterize the energy consumption of Oil & Gas Colombian companies.

As **Machine learning researcher**, I am responsible for: detecting anomalies in the energy consumption of companies using unsupervised learning algorithms, developing and documenting software used to analyze energy consumption in smart-grids from different Colombian companies, and writing technical reports.

TAPAS, European Union's Horizon 2020 2018–2021
Training Network on Automatic Processing of PATHological Speech ([TAPAS](#)). Research and innovation programme under Marie Skłodowska-Curie actions: European Union's Horizon 2020

As an **Early Stage Researcher**, I contributed to the development of computer aided methods to model the progression of neurological diseases. Writing of technical reports

Deep Speech, University of Antioquia, Colombia 2018–2020
Analysis of architectures based on deep learning methods to evaluate and recognize traits in speech signals. I contributed to the development of deep learning techniques to recognize paralinguistic aspects from speech like emotions, presence of voice disorders, identity of the speaker, among others.

SMA², BMBF, Germany 2018–2019
Speech and Movement Analysis using your SMARt phone for neurological diseases (SMA²). I contributed to the development of **Apkinson** (see **Software** below), an app to acquire and to monitor the neurological state of Parkinson's disease patients using speech, hand movements, and fine-motor skills.

VOT, University of Antioquia, Colombia 2018–2020
Phonetic analysis and automatic detection of voiced onset time in speech signals for health-care applications. I contributed to the creation of artificial intelligence-based methods to detect the voiced onset time in speech signals, and use it to detect and to evaluate the presence and degree of pathological speech.

Health Connection, Colombian Ministry of Communication Technologies 2017
Study to measure the level of Communication and information technologies (TICs) in the public Health Services institutions of Colombia.
As **Software developer**, I was in charge of developing a web application to collect data about communication and information technology usage of all public Hospitals in Colombia. I participated in developing data visualization strategies from the Hospitals

Multimodal PD, University of Antioquia, Colombia 2017-2019
I developed machine learning models to evaluate the neurological state of patients affected by Parkinson's disease using data from speech, handwriting, and gait.

Emotions, COLCIENCIAS, Colombian government 2014-2015
Automatic recognition of emotion from speech signals in non-controlled environments. I developed machine learning models to recognize emotions from speech. Writing scientific publications.

Education

Doktor Ingenieur (Ph.D.), Dep. of Informatik, Friedrich Alexander Universität Erlangen-Nürnberg, Germany, & University of Antioquia, Colombia 2018–Present

Master in Telecommunication Engineer, Dep. of Electronics and Telecommunications Engineer, University of Antioquia, Colombia 2016

Bachelor in Electronics Engineer, Dep. of Electronics and Telecommunications Engineer, University of Antioquia, Colombia 2013

Software

Phonet 2019
Python framework based on bidirectional gated recurrent neural networks for phoneme recognition and to compute phonological posterior probabilities from speech signals.

Pronoun-Game 2019
Teaching a Child Pronunciation while Learning about Environmental Threats. Alexa skill designed during the INTERSPEECH Hackaton 2019 (Graz, Austria), where I got the first price of the jury panel.

Apkinson 2019
Android application for the continuous monitoring of the neurological state of patients with Parkinson's disease.

Disvoice 2018
Python library to extract features from speech signals.

NeuroSpeech 2018
Open source software platform designed to perform speech analysis of people with neuro-degenerative disorders.

Programming Languages

- Python: 7+ years
- Linux-Bash: 5+years
- C/C++: 3+years
- Android: 3+years
- Java: 3+years
- GIT (version control): 3+years

Tools/Frameworks

Pytorch (Python), Tensorflow (Python), Scikit-learn (Python), Kaldi (Bash), FastAPI (Python), Pandas, Numpy, MongoDB, Matplotlib, PowerBI, Docker, Spark, LaTeX, and cloud computing platforms such as IBM Cloud and Azure databricks.

Teaching

Lecturer , MisionTIC2022 Programming Fundamentals, Ministry of Communication technologies of Colombia, https://www.misiontic2022.gov.co/portal/	2021
Lecturer , Digital Signal Processing Bachelor course, Dep. of Electronics and Telecommunication Engineer. University of Antioquia Course content available online here	2016-2020
Lecturer , Deep Learning for speech and natural language processing Seminar, University of Antioquia	2021
Lecturer , Artificial Intelligence for Pharmaceutical Applications Master course, Department of Pharmaceutical chemistry, University of Antioquia	2019

Languages

- Spanish:** Native proficiency
English: Full professional proficiency
German: Limited working proficiency

Awards and Achievements

2019 Best paper award: Iberoamerican Congress on Pattern Recognition (CIARP). Paper: *Convolutional Neural Networks and a Transfer Learning Strategy to Classify Parkinson's Disease from Speech in Three Different Languages*

2019 First prize INTERSPEECH hackaton, designing of a skill for Alexa devices ([Pronoun-game](#) (see [Software](#)))

2017 IEEE Travel grant for the International Conference on Acoustics, Speech, and Signal Processing (ICASSP).

2015 International Speech and Communication Association Student travel grant to attend INTERSPEECH conference.

2014 Young Researcher and Innovator COLCIENCIAS.

Personal interests

Science, Technology, Traveling, Music Production, Trading, Cooking, Sports

Publications

50+ publications in peer-reviewed conference proceedings and journals in topics related to machine learning, time-series modeling, and natural language processing.

The complete list of my publications can be found [here](#)