Jefferson Rodríguez | System Engineer / Computer science

+57 (321) 417-1645 | jefferson.rc94@gmail.com | https://jeffersonrodriguezc.github.io

Bucaramanga – Santander – Colombia

Summary

Critical thinker with a strong mathematical, probability and statistical background and proven skills in Computer Vision (CV), Natural language processing (NLP), Machine & Deep Learning (ML & DL) and Artificial Intelligence (AI). Additionally, extensive research experience in areas such as image and video processing, biomedical, text processing and cybersecurity. I am currently interested in starting a PhD and working in the domains of vision-language or graph neural networks.

Skills & Abilities

- Excellent **problem-solving** person.
- Extensive experience in **MLOPs**
- +7 years programing in **python**
- +6 years of experience in **ML & DL**
- +1 year working on **GNN.**
- Excellent skills in libraries such as **Tensorflow**, **keras**, **Pytorch**, **PySpark**, **PyG** and **DGL**, etc.
- +6 years of **research** experience
- Excellent expertise in **vision-language** models

Education

Systems and computer engineering (MS) Aug 2018 — Apr 2021

Universidad Industrial de Santander, Colombia.

Degree project oriented to the continuous translation of sign language sentences in video to text using deep neural encoder-decoder architectures (Convolutional and Recurrent network architectures with attention).

System Engineer (BS) Nov 2013 — Jun 2018

Universidad Industrial de Santander, Colombia.

Degree project oriented to pattern recognition in videos for sign language word classification using Bag of features, clustering techniques and Support Vector Machines.

Research & Teaching experience

Professor in data science - EIG Business School | Postgraduate Department Oct 2023 — Present

Las palmas de gran Canaria, Spain - Remote

I teach two courses in the master's program in data science with a minor in artificial intelligence, in collaboration with the Universidad Internacional del Ecuador (UIDE):

- Data science advanced visualization course:
  Visualization of key concepts and data types using the most relevant Python libraries: matplotlib, ggplot2, plotly, pandas, seaborn, bokeh, nvd3, NetworkX and PySpark GraphFrames.

- Neural Networks – Deep Learning:
  Introduction and implementation of deep neural networks, such as Convolutional neural networks (CNN), Recurrent neural networks (RNN), and Generative adversarial networks (GANs).

Teaching & CV Research Assistant — Biomedical imaging, vision & learning lab — Oct 2016 — Apr 2021
Universidad Industrial de Santander, Colombia

My main responsibilities and achievements were:

- I developed the **practical and theoretical contents** of the artificial intelligence and machine learning courses for undergraduate students. [repo]
- **I co-led undergraduate projects** related to machine learning and deep learning for image and computer vision in biomedical applications.
- **I wrote several research proposals** on computer vision to participate in funding programs.
- **Leader of the research** line on sign language recognition and translation in video.

Work experience

Data scientist | Research — Appgate | A cybersecurity company — Sep 2021 — Present
Bogotá, Colombia - Remote

I work together with the research team for the creation and improvement of models for:

- Dynamic face authentication systems using **convolutional deep learning** architectures.
- Behavioral Biometrics Authentication systems using a **Siamese neural network**.
- Anti-impersonation techniques using **user behavior information**.
- Detection of fraudulent banking transactions using **Pyspark** & **Vaex.**

- Use of **MLOps** tools such as **DVC**, **MLFlow** and **Feast** for data versioning, features, models, and experiment tracking.
- Modelling banking fraud transactions as a Graph network using **PyG** and **DGL** libraries.

Data scientist | Research — Data Analytics Center | A government institution Aug 2020 — Sep 2021
Alcaldía de Bucaramanga, Colombia

The main activities carried out were:

- I developed models for estimating Covid-19 cases and hospital bed occupancy using **XGBoost** algorithm and recurrent neural networks. [repo]
- I developed models and explanatory tools for the analysis of comorbidities in patients with COVID-19 using **SHAP** values and **GRADCAM** strategies. [repo]

Noteworthy CV publications

Rodríguez, J. & Martínez, F. (2018). *A Kinematic Gesture Representation Based on Shape Difference VLAD for Sign Language Recognition*. **Computer Vision and Graphics**. ICCVG, Poland, 2018. [link]

Rodriguez, J. & Martínez, F. (2021), *How important is motion in sign language translation*? **IET Computer Vision**, 15: 224-234. [link][code]

Rodríguez, J. & Martínez, F. (2018). *Towards On-Line Sign Language Recognition Using Cumulative SD-VLAD Descriptors*. **Colombian Conference on Computing**. CCC, Colombia, 2018- [link]

Rodríguez, J. *et al.* (2021). *Understanding Motion in Sign Language: A New Structured Translation Dataset*, **Asian Conference on Computer Vision**, ACCV, Japan, 2020. [link][code]

Rodríguez, J. *et al.*, *A Covid-19 Patient Severity Stratification using a 3D Convolutional Strategy on CT-Scans*, **IEEE 18th International Symposium on Biomedical Imaging**, ISBI, France, 2021. [link][code]

Moreno A., Rodriguez J. & Martínez F., *Regional Multiscale Motion Representation for Cardiac Disease Prediction*, **XXII Symposium on Image, Signal Processing and Artificial Vision**, STSIVA, Colombia, 2019. [link]

Moreno A., Rodriguez J. & Martínez F., *Kinematic motion representation in Cine-MRI to support cardiac disease classification*, **Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization**, 2022. [link]

Ruano J, Arcila J, Romo-Bucheli D, Vargas C, Rodríguez J, Mendoza Óscar, Plazas M, Bautista L, Villamizar J, Pedraza G, Moreno A, Valenzuela D, Vázquez L, Valenzuela-Santos C, Camacho P, Mantilla

D, Martínez F. *Deep learning representations to support COVID-19 diagnosis on CT slices*. **Biomedical**, 2021, 42(1):170-83. [link]

Awards and Honors

Meritorious M.Sc. thesis

Awarded date: 06 April 2021

Granting organization: *Universidad Industrial de Santander*

Relevant CV projects

DeepSARS Software Co-author.

Automatic deep learning system for early identification and monitoring of patients at risk of acute respiratory distress syndrome (ARDS).

I participated as a researcher and author in the creation of the *DEEPSARS* software (Patented), a system for the detection and monitoring of patients with COVID-19 using CT, RX medical images and computer vision. *This software was financed by the national government of Colombia and implemented in two local hospitals*. [more][certificate]

Start date: April 2020 – End date: December 2020

Sponsored event participations

Khipu: Latin American meeting in Artificial Intelligence, Uruguay, 2019

Poster: Sign Language Translation using Motion Filters and Attention Models [link]

Sponsoring company: Globant

Pycon: Python Conference, Bogotá, 2023

Sponsoring company: Appgate