



# Daniel Mejía Raigosa

## About me

I am a talented, excellent self-taught person eager for learning, curiosity and passion drive everything that I do, at work as well as at a personal level. As a scientist majored in physics, combined with five years working as freelance programmer, allow me to adopt and implement novel and creative solutions for complex and challenging product requirements. I have good social skills, mainly good communication that's the reason I'm eloquent, empathetic, and conciliator, I like to have open and honest communication channels. One of my convictions is that mutual aid can achieve amazing results, I perform well at teamwork and advocate for it, since I like to see my teammates grow and improve and I look for ways to support them and influence them to be better as means for my own improvement. On a personal side, I enjoy reading a lot, and a regular workout schedule keeps my body healthy. Once in a while I write about my endeavours and findings to have a place where to make auto-documentation and share interesting things, I wish I had more time to keep my blog updated

## Academic formation

2017 **Physicist**, *Universidad de Antioquia*, Medellín

Bachelor on Sciences offered by the Faculty of Exact Sciences, it is focused in formation of professionals capable of doing cutting-edge research and occupy higher education roles.

2005 **Bachiller Académico**, *I.E. La Salle de Campoamor*, Medellín

High school.

## Computation and Programming

Linux/Unix **Advanced**

Integral system administration (users, resources, services, permissions, etc.) at Linux operating systems, with emphasis at GNU/Linux Debian distributions and its derivated distributions (Ubuntu, Mint,...) I'm used to build packages from source when needed, particularly scientific libraries for simulations and general numerical operations. I handle myself really well with the Bash terminal either local or via SSH

Programming **Advanced**

Languages I have wide experience doing software development with different languages and under different paradigms: structured, Object oriented and functional programming.

**Advanced** NodeJS, Go (golang), C, C++, Latex (2ε).

**Intermediate** Python(3), shells Sh and Bash.

**Basic** Vue3, Embedded systems (PIC Microcontrollers, Arduino and compatibles, ESP32, ESP8266, STM32, RaspberryPI).

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## Technologies **Advanced**

Common technologies involved in the development of backend services and microservice-infracstructures, I've focused mainly in High Available and Heavy load microservices in the cloud

**Advanced** API REST (NodeJS with Express and KoaJS; Python with Flask, Django and Falcon; Go: pure go, reveal, go-chi, go-gorilla. Authentication with JWT), Socket.io, Websockets, Redis (in-memory store), Elasticsearch, Git.

**Intermedite** Ansible, Docker, Docker-Compose, Kubernetes (GCP), API GraphQL (NodeJS via ApolloServer, Python via DjangoGraphQL), MongoDB (Python, Go, NodeJS), PostgreSQL (Python, NodeJS, Go).

**Basic** Nginx, Basic Python Datascience Stack: Numpy, Pandas, Matplotlib, Pytorch, Scikitlearn, OpenCV, VUE3

## Cloud **Advanced**

Computing Hands on experience with Cloud platforms, specially with Google Cloud Platform (GCP), Digital Ocean (DO) and Amazon Web Services (AWS) in that order. I'm capable of managing full cloud infrascrtutue at GPC consisting of SQL databases, Kubernetes clusters, Cloud Functions, Firebase, LoadBalancing, Cloud CDNs, and Google App Engine resources with ease. I usually set continuous delivery (CD) pipelines between my source-code forges and cloud-deployed services, so the delivery is always automated and on-time

**Advanced** Google Cloud Platform, Digital Ocean.

**Intermediate** Amazon Web Services, Heroku.

**Basic** IBM.

## Experience

### Software Developer

2017 – Today **Freelance**, *Coordinator: Santiago Gaviria*, Backend Development - DevOps

As freelance programmer I've worked at many projects involving the use of different technologies. Among the most representative, interesting and challenging were,

- The integration of AWS API Gateway, AWS Rekognition, ElasticCompute and AWS Lambda functions for a login system using face recognition. This project lasted three months
- Integrated a simple Access Management server using Python Falcon and MongoDB. Worked for three months
- Integrated an hybrid microservices backend consisting of a central API written in pure Go (Go + MongoDB) that received GeoTiff rasters and communicated with services written in Python (Flask and Falcon) that made data analysis over input data. This project lasted six months.
- Migrated a Django (python) REST API to GraphQL (django-graphql). Involved for four months
- Worked for a recommender system deployed at GCP, build over several microservices and workflows
  - It used a kubernetes clusters (at GCP) with PostgreSQL + ExpressJS for API management, KoaJS + Elasticsearch stack for recommendations.
  - A data ingestion and analysis pipeline (an ETL) ran each weekend starting on fridays. The ETL was spawned using tailored cloud scripts and Google Cloud Scheduler events, the process of spawning the ETL consisted of creating kubernetes clusters at GCP, start a set GCE nodes for analysis, preparing Elasticsearch indices (a new index each weekend), finally the ETL pipeline was triggered and all the relevant details of the execution where notified using a custo made Slack channel, so any details or issues could be addressed if needed. I was responsible of the design and implementation of the spawning process described above (the GCP resource allocation usin client APIs, SlackAPI and Elasticsearch integrations).
  - The data was generated using both images and text descriptions as inputs for a pipeline compromised of Flask Servers with Deeplearning algorithms (using Tensorflow and Pytorch), custom Go tooling for general RGB color space clustering, and word processing over the descriptions. I was responsible of

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setting up the Flask servers, the custom Go tooling and the Pytorch implementations, which used fine-grained analysis over image regions of interests (ROI) to get the desired outputs of the models.

- Each monday, as part of the automation described earlier, a synchronization process ran and kept the production data with fresh information and clean, since the outdated information was removed. The process alerted via slack of the progress and results of the ETL process so adjustments could be made if needed. My client was very satisfied since each monday at 8AM (GMT-5) we could see new live data at production.
- I was the main developer of the KoaJS + Elasticsearch component of this system, which was the core of the recommendations engine implemented at that time.

This has been one of my longest participations on a project, also one of the most challenging due to the nature and complexity of the system. My involvement spanned two and half years.

- A backend consisting of a GraphQL server (ApolloGraphQL) + MongoDB and InfluxDB databases ingesting time series and reporting changes on data via email and push notifications. The challenges of this project are the integrations with the InfluxDB REST API, setting up high availability MongoDB replica set and an InfluxDB relay to have replication (both on client's nodes). Also, setting up a notification module that used the webpush and sendmail (with custom domain) in order to have notify the user of timely and relevant events. I've been working on this for roughly two years and a half.

### Research Groups

2010 – 2021 **Biophysics Research Group (Grupo de Biofísica)**, *Director: Marco A. Giraldo C.*, Facultad de Ciencias Exactas – Universidad de Antioquia, Role: Researcher - Graduated student

**Marco Antonio Giraldo Cadavid.**

**Phone:** (4)219 56 30.

**E-mail:** mantonio.giraldo@udea.edu.co

**Address:** Calle 67 # 53 - 108 – Bloque 6, oficina 431 – Medellín

2011 – 2021 **Physiology and Biochemistry Group - PHYSIS (Grupo de Fisiología y Bioquímica PHYSIS)**, *Director: Juan Camilo Calderón V.*, Facultad de Medicina – Universidad de Antioquia, Role: Researcher - Graduated student

**Juan Camilo Calderón Vélez.**

**Phone:** (4)219 60 30.

**E-mail:** jcalderonv00@yahoo.com

**Address:** Carrera 51D # 62 - 29 – Medellín

### Research Projects

2012 – 2013 **Undergraduate Thesis**, “*Diseño y modelación in silico de la vía de señalización de CDK5 involucrada en la hiperfosforilación de  $\tau$* ”, Escuela de Microbiología y Bionálisis – Universidad de Antioquia, Grupo de Neurociencias de Antioquia, Role: Advice and Simulations

Presented by: **Alejandro Uribe Arias.**

**E-mail:** uribealej@gmail.com

**Asesor:** MSc. John Fredy Castro Álvarez, Candidato PhD. Del Grupo de Neurociencias de Antioquia (2013)

2011 – 2017 **Proyecto CODI**, “*Estudio del acoplamiento excitación-contracción en músculo esquelético de mamífero según el tipo de fibra en condiciones de reposo y fatiga*”, Facultad de Medicina – Universidad de Antioquia, Role: Student researcher  
Under supervision of: **Juan Camilo Calderón Vélez**.  
**Teléfono:** (4)219 60 30.  
**E-mail:** jcalderonv00@yahoo.com

2014 **Project**, “*Diseño y construcción de un Foto-biorreactor de columna de burbujeo con monitoreo de concentración de microalgas en tiempo real*”, Universidad de Antioquia, Role: Research and electronics  
Main researchers: Gerardo Gutierrez G., Daniel Mejía R.

2015 **Project**, *Genomics and Transcriptomics Cooperation between Grupo de Biofísica and el Grupo de Herpetología, Faculty of Exact and Natural Sciences*, Universidad de Antioquia, Role: Software development and simulations, proposed algorithms and implemented them in order to find DNA sequences exploiting HPLC and GRID DNA and HPC (High Performance Computing) infrastructure available. The deliverables performed computations on a fraction of the expected time, algorithms of my own, implementation at C++.

### Academic Exchange

2012 **Venezuela**, *Cellular Physiology Laboratory Internship*, IVIC (Instituto Venezolano de Investigaciones Científicas), Role: Student internship  
Learning experimental protocols in skeletal muscle physiology. Calibration of intracellular fluorescent dyes of *single wavelength* kind.  
Internship under the advice of PhD. Carlo Caputo and Msc. Pura Bolaños – IVIC, PhD. Juan Camilo Calderón – Facultad de Medicina - Universidad de Antioquia.

### Given courses

2016 **Tutor**, *IESONLINE*, Medellín, Intensive course on GNU/Linux systems and git version control  
Design of course contents on GNU/Linux systems, the linux terminal and general system administration, with an introduction to the use of GIT version control. The course had a length of 8 hours  
**IESONLINE:** departamentotecnico@iesonline.com.co

### Volunteering

2011 – 2013 **Comité Académico**, *Revista de Divulgación Científica Mínima Acción*, Medellín, Non paid  
General editing and content moderation of contents for the magazine, caring for the scientific rigor and seriousness

2013 **Cómo detectamos las partículas subatómicas?**, *Biblioteca EPM*, Medellín, Non paid  
Activity directed to high-school teachers, consisting in how to build a homemade cosmic-ray detector in the classroom so the students could see subatomic particles. The activity was part of the *Workshop on scientific divulgation on modern physics* offered by the *Mínima Acción*. magazine

2011 **Primer Congreso de Divulgación Científica**, *Universidad de Antioquia*, Medellín, Non paid  
Logistics

2010 **IX Juegos Suramericanos**, Medellín, Non paid  
Protocol volunteer at different contests

2009 **XIX Campeonato Sudamericano de Mayores y IX Infantil, Junior y Sub 21 de Karate Do**, Medellín, Non paid  
Logistics and general volunteering.

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## Others

- 2009 **Karate-Do Instructor**, *INDER Medellín*, Medellín, Proyecto del Presupuesto Participativo y la Liga Antioqueña de Karate-Do  
Karate-Do instructor for the project: *Clubes de Karate Do y Judo en Guayabal Modelo de Desarrollo Humano y Convivencia Ciudadana*.  
**Juan David Cañon Montaño**. Licenciado en Matemáticas y Física de la Universidad de Antioquia. Cinturón Negro 3 Dan en Karate Do. Instructor de Karate Do – Universidad de Antioquia. Instructor de Karate Do – Colegio Mayor de Antioquia. Ex-presidente de la Liga Antioqueña de Karate Do  
**Teléfono:** 300 610 00 32.

## Languages

- Español **Mother tongue**  
English **Fluent**  
Fluent at speaking, writing and reading

## Congresses and seminars

- 2013 Course: Curso de Actualización en Genómica, Transcriptómica y Proteómica. 1 y 2 de Octubre de 2013. Corporación de Ciencias Básicas Biomédicas (CBB). Universidad de Antioquia. Medellín. Asistente.  
2013 Course: Simulations of the dynamics of biomolecules using the GROMACS package. 4, 5, 11, 12, y 13 de Junio de 2013. Universidad de Antioquia. Medellín. Asistente.

## Pair Reviewed Research

Juan C. Calderon, Daniel Mejía Raigosa, Marco Giraldo, Pura Bolaños, and Carlo Caputo. Calibration of  $Ca^{2+}$  transients obtained with the fast  $Ca^{2+}$  and  $Mg^{2+}$  dye magfluo-4. *Biophysical Journal*, 104(2):293a, February 2013.

John Fredy Castro-Alvarez, Sergio Alejandro Uribe Arias, Daniel Mejía Raigosa, and Gloria Patricia Cardona Gomez. Cyclin-dependent kinase 5, a node protein in diminished tauopathy: a systems biology approach. *Frontiers in Aging Neuroscience*, 6(232), 2014.

D Mejía-Raigosa, AF Milán, MA Giraldo, and JC Calderón. A new set of equations for the simplified calibration of fluorescence  $Ca^{2+}$ ; transients in skeletal muscle fibers. *Journal of muscle research and cell motility*, 42(2):161—168, June 2021.