Sebastian Franco Ulloa, Ph.D. **Data Scientist**

With 7 years of programming experience and a Ph.D. in biocomputational sciences, Sebastian specializes in developing pipelines to streamline and analyze large datasets. He has worked as a data scientist, data engineer and bioinformatician, honing his skills in statistical modeling, industrial software development, cloud computing and project/team management. He thrives in spaces where he can learn new technologies and spar ideas with his colleagues. Sebastian approaches challenges with an analytical and compassionate mindset, actively seeking diverse perspectives to make well-informed decisions. He describes himself as a determined problem solver with a sense of humor, while his peers see him as disciplined, goal-oriented and caring.

Contact 12

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- in sebastian-franco-ulloa
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- 💭 cebasfu93
- 🙎 Oslo, Norway

Skills ξÕ}

- Statistical analysis
- Machine learning
- Data visualization

Team management

Storytelling

Teaching

Python

- SQL
- GCP/AWS
- Docker
- Terraform
- Apache Airflow
- Apache Beam

At Languages

- Spanish
- English

Italian

Norwegian

🖶 Work Experience

Senior Al Engineer

DN Media Group. Norway.

Developed and deployed AI products using LLMs, integrating DBT, From BigQuery, and cloud-based solutions. Built NLP and time series 2025 forecasting models, contributed to Python package deployment, and managed GCP infrastructure with Terraform. Worked on data modeling, workflow automation, and cloud-based application debugging.

Senior Data Scientist - Consultant

Oslo University Hospital - Cytofit. Norway.

Developed a Python web application to clean and analyze omics data. The pipeline leveraged supervised AI methods to extract features and 2024 identify biomarkers predictive of clinical outcomes. Implemented 2023 front-end (Streamlit and Dash), database (MongoDB and PostgreSQL), API (FastAPI) and parallelization solutions to optimize the pipeline's performance. Led a team of 5 with agile methods (SCRUM). Secured 5 MNOK funding (2 MNOK from Innovation Norway).

Data Scientist and Backend Developer - Consultant Resonyx. Norway.

Analyzed terabytes of high-frequency audio data to detect anomalies 2022 and baseline variations. Developed and deployed ML/AI models to 2021 predict failures in heavy hydropower machinery. Maintained an AWS cloud infrastructure, including databases, long-term storage, roles and monitoring systems. Led a team of 7 with agile methods (SCRUM).

Researcher

Italian Institute of Technology. Italy

2021 Studied the interaction between drugs and biomolecules with ML/AI and statistical inference models, in Python. Participated in 4 drug 2017 discovery campaigns and identified hit compounds for different forms of cancer and bacterial infections. Authored 9 peer-reviewed publications and supervised 2 master's students.

Education

Ph.D. Biocomputational Sciences (cum laude)

- 2021 Italian Institute of Technology. Italy.
- 2017 Thesis title: Multiscale Modeling of Metal Nanoparticles for Biotechnological Applications.

BSc. Physics (GPA 3.59)

- 2017 University of Los Andes. Colombia.
- 2012 Thesis title: Simulations of a Weakly Self-Interacting Fluid Using Lattice Boltzmann Methods (Graded 4.00/4.00).

BSc. Chemistry (GPA 3.57)

- 2016 University of Los Andes. Colombia.
- 2011 Thesis title: Application of Molecular Mechanics for the Discovery of Novel Microbial IIA Topoisomerases Inhibitors (Graded 4.00/4.00).

Other Work Experience

Guest Researcher

Hyllerås Centre for Quantum Molecular Sciences. Norway.

2019 Parallelized data analysis routines in high-performance computing (HPC)
 2018 environments with PBS and Slurm. Honed Python skills for data analysis and visualization. Performed numerical simulations in C to study polymer
 aggregation. Worked in an international environment.

Research Intern

2016 Italian Institute of Technology. Italy.

Participated in a drug discovery campaign for antimicrobial agents. Used numerical simulations to study interactions between drugs and proteins.
 Reported weekly to the principal investigator guiding the campaign.

Part-time Professor

University of Los Andes. Colombia.

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 - Grade from students: 3.72/4.00

Teaching Assistant

2016 University of Los Andes. Colombia

2013 Imparted 3-hour weekly lectures to 20+ students as a complement to the main sessions of various courses, including Quantum Chemistry, Computational Chemistry and Physical Chemistry II.

Other Certified Education

Certified Courses on Data Science

2020 2019

2016

2011

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DataCamp Career tracks on machine learning (93 hours), data science (100 hours)

and Python programming (52 hours).

Certified Online Course on Leadership and Innovation

MIT Professional Education

2020
40-hour course on how to incorporate IT technologies into business roadmaps. Technologies included AI, blockchain, IoT, cloud computing and cybersecurity. Coordinated three discussion forums, three reflection essays and two exams with other international participants.

Modern Physics at All Scales Summer School

Leiden University. The Netherlands.

Program for undergraduate students to explore various research disciplines and applied physics under the guidance of leading experts. It • included talks, hands-on lab tours and cultural exchange events.

Special Achievements

Full scholarship from Becas Santander to enroll in an online course from the *Massachusetts Institute of Technology (MIT)*. The scholarship covered the enrollment fee of \$2,300 of the MIT - Leading Digital Transformation certified course.

 Winner of the research grant HP10CR7KHL from the Italian SuperComputing Resource Allocation-Class C (ISCRA-C). Earned 25,000 core hours from the SuperComputing Applications and Innovation (SCAI) center.



Scikit-learn TensorFlow/Keras Pandas Numpy SQLAlchemy/SQLite Psycopg Pydantic FastAPI Dash-Plotly Streamlit Matplotlib Seaborn Pytest/Unittest GCP **BigQuery Cloud Storage Cloud Functions** IAM **API** Gateway Artifact Registry PubSub PostgreSQL TimeScaleDB **GitHub** Actions MKDocs

Sphinx

- Markdown/ReStructure Text
- JupyterLab

VSCode

Scientific Publications

- Franco-Ulloa, S., Cesari, A., Zanoni, G., Riccardi, L., Wallace, J., Mascitti, B. B., Rastrelli, F., Mancin, F. & De Vivo, M. Rational Design of Gold Nanoparticle-based Chemosensors for Detection of the Tumor Marker 3-Methoxytyramine. 2025. *Chem. Sci.* 16: 6282-6289.
- (Cover article) Franco-Ulloa, S., Cesari, A., Riccardi, L., De Biasi, F., Rosa-Gastaldo, D., Mancin, F., De Vivo, M. & Rastrelli, F. Molecular Mechanisms Underlying Detection Sensitivity in Nanoparticle-Assisted NMR Chemosensing. 2023. J. Phys. Chem. Lett. 14 (30): 6912-6918.
- (Cover article) Franco-Ulloa, S., Riccardi, L., Rimembrana, F., Grottin, E., Pini, M. & De Vivo, M.
 NanoModeler CG: A Tool for Modeling and Engineering Functional Nanoparticles at a Coarse-Grained Resolution. 2023. J. Chem. Theory Comput. 19 (5): 1582-1591.
- (Cover article) Pecina, A. Rosa-Gastaldo, D., Riccardi, L., Franco-Ulloa, S., Milan, E., Scrimin, P., Mancin,
 F. & De Vivo, M. On the metal-aided catalytic mechanism for phosphodiester bond cleavage performed by nanozymes. 2021. ACS Catal. 11 (14): 8736-8748.
- (Cover article) Franco-Ulloa, S., Guarnieri, D., Riccardi, L., Pompa, P. P. & De Vivo, M. Association mechanism of peptide-coated metal nanoparticles with model membranes: A coarse-grained study. 2021. J. Chem. Theory Comput. 17 (7): 4512-4523.
- (Co-first author) Morillas-Becerril, L., Franco-Ulloa, S., Fortunati, I., Marotta, R., Sun, X., Zanoni, G., De
 Vivo, M. & Mancin, F. Specific and nondisruptive interaction of guanidium-functionalized gold nanoparticles with neutral phospholipid bilayers. 2021. Commun. Chem. 93: 4.
- Mestizo, P. D., Narváez, D. M., Pinzón-Ulloa, J. A., Torres Di Bello, D., Franco-Ulloa, S., Macías, M. A., Groot, H., Miscione, G. P., Suescun, L. & Hurtado, J. J. Novel complexes with ONNO tetradentate coumarin Schiff-base donor ligands: X-ray structures, DFT calculations, molecular dynamics and potential anticarcinogenic activity. 2020. *Biometals*. 34: 119-140.
- Franco-Ulloa, S., Tatulli, G., Løland-Bore, S., Moglianetti, M., Pompa, P. P., Cascella, M., De Vivo, M. Dispersion state phase diagram of citrate-coated metallic nanoparticles in saline solutions. 2020. Nat. Comm. 11: 5422.
- Ortega, J. A., Arencibia, J. M., Minniti, E., Byl, J. A. W., Franco-Ulloa, S., Borgogno, M, Genna, V., Summa,
 M., Bertozzi, S. M., Bertorelli, R., Armirotti, A., Minarini, A., Sissi, C., Osheroff, N. & De Vivo, M. Novel, potent, and druglike tetrahydroquinazoline inhibitor that is highly selective for human topoisomerase II α over β. 2020. J. Med. Chem. 63 (21): 12873-12886.
- Arencibia, J. M., Brindani, N., Franco-Ulloa, S., Negro, M., Kuriappan, J. A., Ottonello, G., Bertozzi, S. M., Summa, M., Girotto, S., Bertorelli, S., Armirotti, A. & De Vivo, M. Design, synthesis, dynamic docking, biochemical characterization, and in vivo pharmacokinetics studies of novel topoisomerase II poisons with promising antiproliferative activity. 2020. J. Med. Chem. 63 (7): 3508-3521.
- (Cover article) Franco-Ulloa, S., Riccardi, L., Rimembrana, F., Pini, M. & De Vivo, M. NanoModeler: A webserver for molecular simulations and engineering of nanoparticles. 2019. J. Chem. Theory Comput. 15 (3): 2022-2032.
- Torres, J. F., Macías, M. A., **Franco-Ulloa, S.**, Miscione, G. P., Cobo & J., Hurtado, J. J. Cu(II) and Zn(II) complexes with dinitrobenzoates and pyrazolyl ligands: structural and thermal stability influence of N– H moiety. **2019**. *Crystal Growth and Design*. 19 (6): 3348-3357.
- **Franco-Ulloa, S.**, La Sala, J., Miscione, G. P. & De Vivo, M. Novel bacterial topoisomerase inhibitors exploit Asp83 and the intrinsic flexibility of the DNA gyrase binding site. **2018**. *Int. J. Mol. Sci.* 19 (2): 453.
- **13** Franco-Ulloa, S., Ramos-Guzmán, C. A. & Miscione, G. P. The evolution of drug design and the role of computational methods: Playing to be God. **2016**. *Hipótesis*. 21: 40-49.

Oral and Poster Scientific Presentations

- 1 Invited speaker at the Intelligent Health Conference. 2024. Norway.
- Speaker at the Properties and Functionalities of Nanometer and Sub-Nanometer Sized Quantum 2 Objects Gordon's Research Conference, 2019. Switzerland.
- Poster presentation at the New Perspectives of Nanostructured Devices and High-Resolution 3 Characterization Techniques Gordon's Research Seminar. 2019. Switzerland.
- Poster presentation at the Nucleic acid immunity: from cellular mechanisms to new technologies 4 SIBBM seminar. 2019. Italy.
- Speaker at the Challenges in modelling and simulations of nanoparticles in complex environments 5 CECAM workshop. 2019. Italy.
- Poster presentation at the Translational and Health Informatics: Implications for Drug Discovery 6 EuroQSAR Symposium. 2018. Greece.
- Poster presentation at the Multiscale modelling in electrophysiology: from atoms to organs CECAM 7 workshop. 2018. Switzerland.
- Poster presentation at the 1st Protein Structure, Function, and Drug Discovery School. 2017. 8 Colombia.
- Speaker at the 42nd Theoretical Chemists of Latin Expression Congress. 2016. Uruguay. 9
- 10 Speaker at the 6th National Congress of Theoretical and Computational Chemists. 2016. Colombia.
- Speaker at the 2nd Colombian Congress of Biochemistry and Molecular Biology. 2016. Colombia. 11

Volunteering

2024

2019

Peer Reviewer

Journal of Chemical Theory and Computation

Reviewed one manuscript per month on computational biology and assess their potential for publication.

Teacher 2021

Foundation for Educational Equity. Colombia

2020 Designed a year-long introductory Python course targeting high school students in remote areas of Colombia with limited internet access. Provided slides and recorded teaching sessions.

Quiero Mentoría ("I Want Mentorship") Program

2021 Uniandinos - Alumni Association. Colombia

University of Los Andes. Colombia

2020 Provided mentorship to 2 undergraduate mentees for a total of 6 hours per month and assisted them in their transition to a professional working environment or postgraduate programs.

Board Member at the Student's Council

2015 2013

Participated in the final decision-making process for students' academic and disciplinary matters, involving approximately ten cases per week.

Teacher/Fundraiser 2013

SOSAndes - Students Offering Support. Colombia 2012 Raised ca. 300€ giving physics classes to build shelters for underprivileged communities in Colombia.