Consultant at Expert Analytics AS. PhD in biocomputational sciences with a background in physics and chemistry. My areas of interest include data science, machine learning, object-oriented programming, molecular dynamics, drug discovery, nanomaterials, and the theory of evolution. My values are based on the scientific method, critical thinking, and teaching. I am an analytical and compassionate person prompt to hear different perspectives on the same problem, to consolidate them into the most informed and reasonable judgement possible.

Work History

2021-03 – Present
Consultant
Expert Analytics. Oslo, Norway
- Implement mathematical models and data science solutions to innovate and optimize industrial processes

2018-01 – 2021-02
Research collaborator – PhD fellow
Italian Institute of Technology (IIT). Genoa, Italy
- Employed atomistic and coarse-grained molecular dynamics simulations for studying functionalized metallic nanoparticles interacting with biomacromolecules
- Targeted human and bacterial DNA topoisomerases for the development of novel anticancer and antimicrobial compounds
- Collaborated with the research groups of Dr. Pier Paolo Pompa, Prof. Fabrizio Mancin, and Prof. Federico Rastrelli in the development of nanoparticle-based technologies
- Applied statistical methods to analyze hundreds of gigabytes of data

2018-09 – 2018-12 and 2019-09 – 2019-12
Guest researcher
Hylleraas Centre for Quantum Molecular Sciences. Oslo, Norway
- Scientist at the Hylleraas Centre for Quantum Molecular Sciences directed by Prof. Trygve Helgaker
- Collaborated with the research group of Prof. Michele Cascella in the study of charged colloids aggregation
- Developed skills in data processing and analysis with Python

2016-01 – 2016-06
Part-time professor
University of Los Andes. Bogotá, Colombia
- Successfully devised and delivered training in analytical chemistry and laboratory practices for a diverse group of undergraduates. Feedback from the students gave me a teaching grade of 3.72/4.00
- Graded over 50 assignments per week including lab reports, workshops, quizzes, and exams

2013-08 – 2016-12
Teaching assistant
University of Los Andes. Bogotá, Colombia
- Instructed weekly 2-hour lectures to 10-50 students on general, theoretical, computational, and physical chemistry topics
- Created a safe learning environment for students while promoting an ethical classroom code-of-conduct

Sebastian Franco Ulloa, PhD

Committed problem solver

Contact

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Languages

Spanish

English

Italian

Norwegian

2013-07 – 2013-12 **Accompaniment program tutor**
University of Los Andes. Bogotá, Colombia

- Tutored five freshmen students in science-related subjects (chemistry, physics, mathematics, and biology) monitoring their progress, issues, and concerns related to university life

Education

2017-11 – 2021-03 **PhD in biocomputational sciences**
Italian Institute of Technology (IIT). Genoa, Italy

- Graduated with honors (*cum laude*, perfect score)
- Thesis title: "Multiscale Modeling of Metal Nanoparticles for Biotechnological Applications."
- Published six articles (plus two submitted and two in preparation) in peer-reviewed journals on innovative research
- Developed skills at proposing research questions, designing experiments, programming, and data analysis

Combined critical thinking, problem-solving, and creativity to attend specific research questions

2018-09 – 2020-08 **Data science certificates of accomplishment**
DataCamp, Inc. Online

- A 245-hour course covering supervised and unsupervised learning with scikit-learn Python's toolkit and SQL database querying
- Developed skills in data processing, data visualization, linear/logistic models, SVM, CART, XGBoost, NLP, and deep learning

2020-05 – 2020-06 **Online course "Leading Digital Transformation"**
Massachusetts Institute of Technology (MIT) – Professional Education

- A 6-week online course on the implementation of artificial intelligence, blockchain, cloud computing, the internet of things, and cybersecurity in organizations and companies

2012-01 – 2017-06 **BSc. Physics**
University of Los Andes. Bogotá, Colombia

- Thesis title: "Simulations of a Weakly Self-Interacting Fluid Using Lattice Boltzmann Methods." Graded 5.00/5.00

2011-08 – 2016-12 **BSc. Chemistry**
University of Los Andes. Bogotá, Colombia

- Thesis title: "Application of Molecular Mechanics for the Discovery of Novel Microbial IIA Topoisomerases Inhibitors." Graded 5.00/5.00

2016-07 – 2016-06 **Summer school "Modern Physics at All Scales"**
University of Leiden. Leiden, The Netherlands

- Summer program aimed at bachelor students to learn about multiple research branches and applied physics by leading experts

Volunteering

2019-12 – Present Reviewer at the *Journal of Chemical Theory and Computation* (American Chemical Society press, impact factor 6.006). Hand-picked by an associate editor to peer-review on manuscripts submitted for publication

Software

- Python
- SQL
- Gromacs
- VMD
- Schrödinger

Skills

- Statistics
- Science education
- Public speaking
- Scientific writing
- Data analysis
- Data visualization
- Skill development
- Critical thinking
- Creativity and innovation

2020-08 – 2021-05 Mentor in the *Quiero Mentoría* (“I Want Mentorship”) program from the Uniandinos – Alumni Association. Offer guidance to 2 undergraduate mentees (6 hours per month) through their transition into a working environment or a postgraduate study program

2014-10 – 2015-09 Elected member of the board of directors at the student’s representative council. Campaigned and earned a position as the student’s representative at the Institutional Committee of Student Affairs, University of Los Andes. Bogotá, Colombia. This committee is the last instance available for students in academic and disciplinary processes. Read ca. ten profiles per week and voted on the outcome of the cases

2013-10 – 2015-09 Student representative of the Chemistry Department, University of Los Andes. Bogotá, Colombia. Elected by peers from the entire department

2012-08 – 2013-07 Teacher and fundraiser at SOSAndes – Students Offering Support. Bogotá, Colombia. Raised ca. 300€ giving physics classes to build shelters for people from the lowest-income regions of Colombia

Special Achievements (2)

2020-05 Full scholarship from Becas Santander equivalent to $2,300 to enroll in the "MIT - Leading Digital Transformation" certified course from the Massachusetts Institute of Technology (MIT)

2020-03 Winner of the research grant HP10CR7KHL from the Italian Super Computing Resource Allocation-Class C (ISCRA-C). Earned 25,000 core hours from the SuperComputing Applications and Innovation center

Presentations (5)

2019-06 *Properties and Functionalities of Nanometer and Sub-Nanometer Sized Quantum Objects* Gordon's Research Conference. Les Diablerets, Switzerland (Flash talk)

2019-05 *Challenges in Modeling and Simulations of Nanoparticles in Complex Environments* CECAM workshop. Genoaa, Italy

2016-11 *42nd Theoretical Chemists of Latin Expression Congress*. Montevideo, Uruguay

2016-11 *2nd Colombian Congress of Biochemistry and Molecular Biology.* Medellin, Colombia

2016-09 *6th National Congress of Theoretical and Computational Chemists.* Bogotá, Colombia

Poster Presentations (5)

2019-07 *New Perspectives of Nanostructured Devices and High-Resolution Characterization Techniques* Gordon's Research Seminar. Les Diablerets, Switzerland

2019-06 *Nucleic Acid Immunity: From Cellular Mechanisms to New Technologies* SIBBM seminar. Bologna, Italy

2018-09 *Translational and Health Informatics: Implications for Drug Discovery* EuroQSAR symposium. Thessaloniki, Greece

2018-03 *Multiscale Modelling in Electrophysiology: From Atoms to Organs* CECAM workshop. Lugano, Switzerland

2017-08 *1st Protein Structure, Function, and Drug Discovery School.* Bogotá, Colombia

Publications (11)

1. 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
2. **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
3. **(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**. 93: 4
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*. DOI: 10.1007/s10534-020-00268-8
5. **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
6. 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
7. 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
8. **(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
9. 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
10. **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

11. **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