

Hugo Madge León | CV

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📁 GitHub

Education

ETH Zürich, Switzerland

MSc

Computational Biology and Bioinformatics, GPA – 5.25/6.0

2020–2023

Joint program with UZH and UniBasel. Relevant courses include: Data Mining I & II; Introduction to Machine Learning; Computational Biomedicine; Natural Language Processing; Statistical Analysis of High-Throughput Genomic and Transcriptomic Data; Functional Genomics; Computational Systems Biology.

University of Hong Kong (HKU), Hong Kong

Year Abroad

BSc Molecular Biology and Biotechnology

2018–2019

I was the only student from the School of Biological Sciences selected to participate in the exchange program with HKU. Relevant courses I completed include: Introduction to Bioinformatics; Molecular Biology of the Gene; Business Aspects of Biotechnology.

University of Edinburgh, United Kingdom

BSc

Biological Sciences (Molecular Biology), First Class Degree with Honours

2016–2020

Relevant courses I completed include: Structural Biology; Introductory Applied Machine Learning; Gene Expression; Genes and Gene Action; Intro to Computer Systems; Intro to Software Engineering; Microorganisms, Infection, and Immunity. Took part in CompSoc, SIGINT (cyber-security society), and Latin American Society.

Experience

Biomedical Data Science Lab – D-HEST, ETH Zürich

Zürich, Switzerland

PhD candidate

May 2023–Current

The project, funded by the Personalized Health and Related Technologies initiative, aims to identify biomarkers in paediatric sepsis to develop an early warning system. Specifically, we aim to assess the presence of infection, type of infection (bacterial versus viral), and severity (presence and extent of organ dysfunction).

Biomedical Data Science Lab – D-HEST, ETH Zürich

Zürich, Switzerland

Master's Thesis

Sept 2022–April 2023

I completed my Master's thesis at the Biomedical Data Science Lab in ETH Zürich, led by Prof. Dr. Catherine Jutzeler. The project focused on developing a standardised imputation of the European Multi-center Study About Spinal Cord Injury (EMSCI) dataset and evaluate its effects on spinal cord injury (SCI) recovery prediction. The primary goal is to create the largest longitudinal international data source in the field of SCI by imputation in a transparent and reproducible manner. The secondary goal is to improve recovery prediction using this imputed dataset.

ATI Bioinformatics – NIBR, Novartis AG

Basel, Switzerland

Bioinformatics Intern

Mar 2022–Aug 2022

6-month internship in the Bioinformatics team within the Autoimmunity, Transplantation & Inflammatory Disease department at Novartis AG. The goal of the project was to tackle the need for the development of novel therapies that provide a benefit for patients with Chronic Kidney Disease (CKD). To do so, we identified CKD biomarkers from a proteomics dataset, as well as developed a novel bioinformatic approach (based on a Sparse Partial Least Squares model) to integrate transcriptomics and proteomics data with the goal of identifying key cell type associated proteomic networks that are dysregulated in CKD.

MLCB – D-BSSE, ETH Zürich

Lab Rotation

Basel, Switzerland

Sep 2021–Dec 2021

6-week project at the Machine Learning and Computational Biology Lab (MLCB) in ETH Zürich, led by Prof. Dr. Karsten Borgwardt. The project focused on understanding the impact of limited knowledge and ascertainment bias on biological networks on the performance of network-based GWAS. This involved devising a simulation scheme to simulate biological networks showing different degrees of completeness, with the aim of creating a pipeline for future testing of incompleteness of network-based GWAS methods.

Stracquadanio Lab – University of Edinburgh

Research Intern

Edinburgh, UK

June 2020–November 2020

Project carried out under the supervision of Dr. Giovanni Stracquadanio, analysing genome-wide association studies (GWAS) on cancer SNPs and determining their effect on gene expression and their pathways. This included using data from the GWAS Catalog, GTEx, and KEGG. The aim of this study was to identify pathways highly affected by cancer-associated SNPs and carry out the appropriate data visualisation.

Volunteer Experience

Verein der Informatik Studierenden (VIS)

CCBB, Committee President

Zürich, Switzerland

Feb 2021–Mar 2023

I took on the role of president of the Committee for Computational Biology and Bioinformatics. My responsibilities included creating events, fostering bonds between students, giving advice when questions arise, and connecting students to pharmaceutical/biotech/healthtech companies that have established strong data analytics capabilities. I was a committee member until February 2022.

Soap Cycling

Global Team Intern

Hong Kong

Jan 2019–May 2019

Soap Cycling is a non-profit company that works to recycle soap from hotels in Hong Kong to reduce preventable hygiene-related diseases by distributing it to where it is needed the most. I led the creation of new Soap Cycling branches in the Philippines and Myanmar, acting as a consultant for new employees in those countries. This included creating a business plan and fundraising for the expansion, providing training to new hires, and being the liaison between HQ and other branches.

Projects and Awards

2023: *Bits to Breakthroughs*; One of the founding members of the Bits to Breakthroughs series of symposiums whose objective is to connect clinicians and researchers in data-driven fields of biomedical research. This began with the 1st National Symposium on Data-Driven Approaches in Sepsis and Infectiology in November 2023.

2021: *Introduction to Machine Learning project*; Created a NN to classify image triplets based on similarity, using the first image as an anchor and deciding which of the other two images is closest to the anchor. Used ResNet50 trained on the ImageNet database as our pre-trained model.

Skills

Python: Proficient

Keras/Tensorflow, scikit-learn, Pandas, Dask, networkx, Matplotlib

R: Professional experience

mice, ggplot2, Bioconductor, lme4, SingleCellExperiment

Also have professional experience with: Git, MATLAB, Linux OS

Also familiar with: SQL, Java, HTML & CSS, C, JavaScript

Languages

Native: English, Spanish

Working Proficiency: Catalan, Portuguese

Colloquial: French, Italian