VICENTE CASTRO SOLAR

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EDUCATION

Politecnico di Milano (PoliMi) Sept 2021 - **Jul 2024**
MSc. Computer Science — GPA: 28.6/30 Milan, Italy
↦ Expected graduation grade: 110/110

Pontificia Universidad Católica de Chile (PUC) Jan 2017 - Jun 2021
BSc. Computer Science — GPA: 6.4 (Top 1%) Santiago, Chile

RESEARCH EXPERIENCE

Politecnico di Milano Sept 2023 - **Now**
Master's Thesis Advisor: *Manuel Roveri*

Neural Architecture Search (NAS) for growing networks in Continual Learning. Studying **plasticity** and **stability** through the loss function landscape (i.e: flat minima solutions). These notions orient the search strategy and allow us to **learn a scaling strategy, for a given continual learning problem**, at design time.

iHealth Institute, Chile Oct 2023 - **Now**
Research Assistant Supervised by *Francisco Sahli* and *Claudia Prieto*

Meta-learning for cine-MRI reconstruction. Implicit Neural Networks can be used as a continual approximation of an image, but they usually suffer from **spectral bias** (i.e: overfitting on the high frequency values). In this work we study **how meta-learning can be used to overcome this problem**.

PUC and University of Notre Dame Jan 2021 - **Now**
Research Assistant Supervised by *Francisco Sahli* and *Maria Holland*

Unfolding the cortex via Graph Convolution Neural Networks (GCNs). The **mechanical folding of the brain** changes the cortical thickness (outer grey matter layer) naturally, but the observed measurements can only be explained by including an additional biological factor. In this project we learn to **regress the biological component using GCNs** and mesh representations of folded brains.

NearLab, Politecnico di Milano Sept 2021 - May 2022
Technical Assistant Supervised by *Alessandra Trapani* and *Alessandra Pedrocchi*

Pre-processing of mice neural recordings. The project aim was to understand the role of the **cerebellum in task-planning and task-learning**. Analysed **one-photon neural recording** captured in-vivo subjects to track neurons through the experiment sessions and understanding how the activation time changes when learning happens.

XCV Lab, PUC Jan 2020 - June 2020
Undergraduate Research Assistant Supervised by *Domingo Mery*

Research **performance biases** on state-of-the-art DL models for Face Recognition (e.g: ArcFace), involving gender, ethnicity and age imbalance.

TEACHING EXPERIENCE

Teaching Assistant March 2019 - June 2021
Computer Science Department (PUC) Santiago, Chile

During my BSc. I was a TA for different maths and computer science courses. I prepared and gave tutorials, guided course projects and solved problems in preparation for the exams.

- **CS Courses:** Artificial Intelligence, Pattern Recognition, Data Mining
- **Maths Courses:** Ordinary Differential Equations, Calculus II, Dynamics

(Popular) pre-University School March 2018 - June 2019
University of Chile Santiago, Chile

Volunteer as a maths and physics teacher for a non-profit initiative to prepare students from endangered backgrounds for the university test. One of the best experiences I have ever had.

INDUSTRY EXPERIENCE

Generali Real Estate Aug 2022 - May 2023
Data Science, Intern Milan, Italy

Took a short break from studies to work in the industry. Mostly developed regression/forecasting models for the RE price in different city zones.

Glik Dec 2021 - Aug 2022
ML Engineer Santiago, Chile

Developed/trained CNN models to recognise DFUs (Diabetic Foot Ulcer), very common in patients with the disease. Also provided the GradCAMS as a soft explainability check for the doctors.

AWARDS AND SCHOLARSHIPS

(2021) #1 place at ImageCLEF-medical Challenge
Captioning task. Presented the results and a working-note paper at the CEUR Workshop 2021.

(2017) Honor Enrollment.
Scholarship for university studies. Lost it as I changed universities and degrees

(2016) Two National Scores at the University Selection Test (PSU)
In Maths and Physics. From 250k students only four had these results

SCIENTIFIC OUTPUTS

Castro-Solar V, Gambella M, & Roveri M. (2024). "Scaling laws for Continual Learning using NAS". *(Thesis and Paper, in preparation).*

Castro-Solar V, Catalán T, Sahli F, & Prieto C. (2024). "Meta-learning for cine MRI reconstruction using Neural Fields". *(In Preparation).*

Castro V, Pino P, Parra D, & Lobel H. (2021). "PUC Chile team at Caption Prediction: ResNet visual encoding and caption classification with Parametric ReLU". *CLEF (Working Notes).*