Manuel Pérez Carrasco

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Education

University of Concepción — Concepción, Chile
MSc. Computer Science. GPA 6.1/7.0 — *Mar. 2017 – Oct. 2019*
B.S. Industrial Engineering GPA 5.9/7.0* — *Mar. 2013 – Sep. 2018*

- Graduated with distinction from MSc. degree and maximum distinction from B.S. degree.
- Author of thesis called "*Semi-supervised adversarial variational domain adaptation for image classification*". Supervised by professor Guillermo Cabrera. Grade 7.0/7.0
- Author of undergraduate honor research thesis called "*Attributes transfer in deep neural networks and their application to astronomical images*". Supervised by professor Guillermo Cabrera. Grade 7.0/7.0
- Honors and Awards:
  - Master's thesis received best student paper award at Astroinformatics 2019 conference, Caltech.
  - Undergraduate honor research thesis published in Publications of the Astronomical Society of the Pacific.
  - Recipient of fully-funded scholarship for MSc. degree.

***** Notice that in Chile, B.S. degrees are usually 11 semesters long.

Research and Professional Experience

Subdirector / Lead Data Scientist — Concepción, Chile
Data Science Unit at University of Concepción — *Jul. 2019 – Present*

- **Mapa Constituyente**: Leaded the technical development of a platform to analyze citizen participation for the upcoming chilean constitution.
- **The Chile we Want (ECCQ)**: Leaded the technical development and analysis team to automate results of citizen participation in the 2019's Chilean social outbreak. Project requested by the Chilean Ministry of Social Development and Sciences.
- **Automatic Learning for the Rapid Classification of Events (ALeRCE)**: Designed and implemented an anomaly detection algorithm for astronomical light curves coming from the Zwicky Transient Facility (ZTF) data stream. Project funded by the Millennium Institute of Astrophysics.
- **Arauco Company**: Co-designed and co-implemented a labeling, training, and predicting platform to count, detect, and segment trees using high-dimensional georeferenced images of forests taken from drone cameras, through cloud-based infrastructure.

Research Assistant — Cambridge, MA, USA
Institute for Applied Computational Sciences (IACS) at Harvard University — *Sep. 2020 – Jul. 2021*

- Research focused on the learning of disentangled representations for semi-supervised domain adaptation.
- Working remotely under Professor Pavlos Protopapas, IACS Scientific Program Director.

Research Assistant — Concepción, Chile
Biomedical Laboratory at University of Concepción — *Jan. 2020 – Sep. 2020*

- Developed a real-time drowsiness detection algorithm using EEG signals, and a real-time segmentation algorithm for gait phases using accelerometer signals. Projects funded by the Chilean government, *Fund for the Promotion of Scientific and Technological Development.*

Research Scholar — Cambridge, MA, USA
Institute for Applied Computational Sciences (IACS) at Harvard University — *Jan. 2019 – Jun. 2019*

- Member of the *Harvard-Chile Data Science School.*
- Development of master's thesis. Research focused on semi-supervised domain adaptation algorithms for image classification.
- Work under Professor Pavlos Protopapas.
- Recipient of IACS financial aid for research development (stipend and flight tickets).

Internship — Concepción, Chile
Coca-Cola Embonor S.A — *Jan. 2018 – Feb. 2018*

- Developed a forecasting software to estimate sales and demand for $\sim$ 1500 sku.

Teaching Experience

University of Concepción Concepción, Chile

Lecturer at the School of Engineering Department. *Jul. 2019 – Present*

- Co-taught Introduction to Machine Learning, Advanced Topics in Machine Learning, Introduction to Data Science, and Deep Learning. Elective courses for graduate and undergraduate students.
  - Co-designed curriculum, lectures, assessments, laboratories, and homework for audiences of $\sim$ 30 students.
  - Co-graded assessments, homework and projects.
  - Co-taught with Professor Rodrigo de la Fuente and Guillermo Cabrera.

Teaching Assistant at the School of Engineering. *Aug. 2017 – Sept. 2020*

- Teaching assistant of Systems Modeling (2017-2), Machine Learning for Business Intelligence (2018-1), Data Science I (2020-1), and Data Science II (2020-2).
  - In charge of recitation and laboratories for System Modeling and Machine Learning for Business Intelligence.
  - Guided undergraduate/graduate students in their applied data science projects for Data Science I and Data Science II.
  - Worked under Professors Guillermo Cabrera, Rodrigo de la Fuente, and Pablo Catalán.

Harvard University Cambridge, MA, USA

Teaching Fellow of CS109b: Advanced Topics in Data Science at IACS. *Feb. 2019 – May 2019*

- Served as teaching fellow for Advanced Topics in Data Science, a mandatory course for the Data Science Master Program and Computer Science PhD Secondary Field in Data Science at Harvard University.
  - In charge of grading, office-hours, and guiding students in their applied machine learning projects.
  - Worked under professor Pavlos Protopapas.

Publications and Preprints

M. Pérez-Carrasco, P. Protopapas, and G. Cabrera-Vives. "*Con^{2}DA: Simplifying Semi-supervised Domain Adaptation by Learning Consistent and Contrastive Feature Representations*". NeurIPS 2021 Workshop on Distribution Shifts, 2021.
P. Sánchez-Sáez, H. Lira, L. Martí, N. Sánchez-Pi, , et al. "*Searching for Changing-state AGNs in Massive Data Sets. I. Applying Deep Learning and Anomaly-detection Techniques to Find AGNs with Anomalous Variability Behaviors*". The Astronomical Journal, 2021.
F. Förster, G. Cabrera-Vives, E. Castillo-Navarrete, P. A. Estevéz, P. Sánchez-Sáez, et al. "*The Automatic Learning for the Rapid Classification of Events (ALeRCE) Alert Broker*". The Astronomical Journal, 2021.
M. Pérez-Carrasco, G. Cabrera-Vives, P. Protopapas, N. Astorga, and M. Belhaj. "*Matching Embeddings for Domain Adaptation*". ArXiv 1909.11651, 2020.
M. Pérez-Carrasco, G. Cabrera-Vives, M. Martinez-Marín , P. Cerulo, R. Demarco, P. Protopapas, J. Godoy, and M. Huertas-Company. "*Multiband galaxy morphologies for CLASH: a convolutional neural network transferred from CANDELS*", Publications of the Astronomical Society of the Pacific (PASP), 2019.

Conferences and Workshops

NeurIPS 2021 Workshop on Distribution Shifts. **Expositor**. Vancouer, Canada.
Astroinformatics 2019. **Expositor. Best student paper award**. Caltech, Pasadena, CA, USA.
ComputeFest 2019. **Trainer**. Harvard University, Cambridge, MA, USA.
Big Data Astronomy Workshop 2018. **Expositor**. University of Concepción, Concepción, Chile.

Technical Skills

Languages: Spanish (Native speaker), English (TOEFL: 96/120).
O.S: GNU/Linux, macOS.
Tools: Git, Google Cloud Platform, Amazon Web Services, VS Code, LaTeX
Libraries: Pytorch, Keras, Tensorflow, scikit-learn, NumPy, Matplotlib, pandas.