Carlos Mora Sardiña

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Education

Ph.D. in Computational Science and Engineering — Irvine, California
University of California, Irvine — *Sep. 2021 – Present*

M.S. in Aerospace Engineering — Barcelona, Spain
Polytechnic University of Catalonia — *Sep. 2020 – June 2022*

B.S. in Aerospace Engineering — Barcelona, Spain
Polytechnic University of Catalonia — *Sep. 2016 – June 2020*

Experience

Graduate Student Researcher — Irvine, California
University of California, Irvine — *Sep. 2021 – Present*

- Research topics: scientific machine learning, data fusion and uncertainty quantification.
- Developer of NN-CoRes, a physics-informed machine learning approach that integrates neural networks with kernel methods for solving PDEs. NN-CoRes achieves an advanced performance in terms of accuracy, robustness and development time over state-of-the-art methods.
- Developer of Pro-NDF, a probabilistic machine learning method for data fusion based on Bayesian neural networks. Pro-NDF enables the integration of an arbitrary number of data sources to enhance the prediction accuracy and reliability at a lower data acquisition cost.
- Developer of GP+, a Python open-source library built on PyTorch for machine learning and statistical modeling via Gaussian processes. GP+ systematically integrates multi-fidelity emulation, computer model calibration and Bayesian optimization.
- Developer of a data-driven approach to calibrate computer models based on latent map Gaussian processes for multi-fidelity data sets with an engineering application on materials design.

Software Engineer Intern — Barcelona, Spain
Applus+ Laboratories — *March 2019 – July 2019*

- Successfully developed in C++ and MATLAB the software component of a test bench for evaluating the performance of the main gearbox in helicopters.
- Process automation with programmable logic controllers, ensuring a smooth and efficient test bench operation.
- Proven problem-solving and communication skills within a professional setting, as I consistently reported exceptional results in a timely manner to the team.

Awards and Honors

Full scholarship, Balsells fellowship — *Sep. 2021*
Given to students with high academic performance to pursue graduate studies in the United States.

Honors, Polytechnic University of Catalonia — *June 2016*
Graduated with honors in Physics II, Physics III, Aerodynamics and Automatic Control.

Honorable mention, Catalan Government — *June 2016*
Top 100 students in the university entrance exam in Catalonia.

Skills

Programming: Python, PyTorch, TensorFlow, NumPy, scikit-learn, MATLAB, C++, Git, LaTeX

Languages: Spanish (Native), Catalan (Native), English (Fluent), French (Intermediate), Italian (Intermediate)

Selected Publications

- **Mora, C.**, Yousefpour, A., Hosseinmardi, S., Bostanabad, R., Bostanabad, R. (2024). "Neural Networks with Kernel-Weighted Corrective Residuals for Solving Partial Differential Equations" *arXiv preprint.*
- **Mora, C.**, Eweis-Labolle, J. T., Johnson, T., Gadde, L., Bostanabad, R. (2023). "Probabilistic Neural Data Fusion for Learning from an Arbitrary Number of Multi-fidelity Data Sets" *Computer Methods in Applied Mechanics and Engineering.*