Bruno Jacob

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Education

University of California, Santa Barbara — Santa Barbara, CA
Ph.D., Computational Sciences and Engineering — *Aug. 2015 – September 2021*

Universidade Federal de Uberlandia — Uberlandia, Brazil
B.Sc., M.Sc., Mechanical Engineering — *Aug. 2009 – August 2014*

Experience

Graduate Research Assistant — Sept. 2018 – Present
University of California, Santa Barbara — *Santa Barbara, CA*

- Contributor to a deep learning software package to optimize chemical reactions and accelerate the fabrication of natively entangled quantum materials
- Contributor to StochSS: a library to investigate the effects of stochastic dynamics in biophysical systems subject to multiple chemical reactions and fluid flows
- Performed numerical simulations of convective sodium transport in the brain, and analyzed large datasets

Graduate Teaching Assistant — Jan. 2016 – Jun. 2019
University of California, Santa Barbara — *Santa Barbara, CA*

- Taught lab sections and lectures for undergraduate-level courses for Engineering, Computer Science, Mathematics and Physics students
- Classes: Fluid Mechanics, Heat Transfer, Introduction to Programming, Strength of Materials, Mathematics of Engineering, Numerical Analysis

Associate Researcher — May 2019 – Aug. 2019
Argonne National Laboratory — *Lemont, IL*

- Contributed in development of a software (Julia/Python) that predicts power line overload, desynchronization and blackouts using dynamical systems theory
- Performed HPC simulations and analyzed data
- Awarded the James Wallace Givens fellowship from the Theory and Computer Science division

Visiting Research Scientist — May 2013 – Sept. 2013
California Institute of Technology / Jet Propulsion Laboratory — *Pasadena, CA*

- Developed scientific software (Fortran 90/ Matlab) to simulate and extract data from simulations of two-phase flows in icy worlds
- Performed numerical simulations in HPC clusters
- Organized presentations and group meetings

Technical Skills

Languages: Python, Julia, C/C++, Matlab, MySQL, R, Fortran 90
Developer Tools: Git, Vim, Visual Studio, PyCharm, Geany
Libraries: Pandas, NumPy, Matplotlib
Deep learning libraries: TensorFlow2/Keras, Scikit-learn
Parallel computing: MPI, OpenMP, OpenACC, Cilk+

Projects

StochSS (Stochastic Simulation Service) | *Python, C, C++* — September 2019 – Present

- Contributor in the development of web-based service for modeling, simulation, and analysis of a wide range of mathematical, biological and biochemical systems

A Deep learning framework for natively entangled materials | *Python, Julia* — August 2020 – Present

- Contributor in the development of a deep learning library for the prediction of optimal chemical reactions, aiming to accelerate the fabrication of high purity crystalline quantum materials