# Francisco J. Carrillo Ph.D.

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## EDUCATION

**Princeton University**
PH.D. COMPUTATIONAL PHYSICS & MACHINE LEARNING (ML)
2021 | Princeton, NJ

MA, CHEMICAL ENGINEERING
2018 | Princeton, NJ

**U.T. Austin**
BS, CHEMICAL ENGINEERING
2016 | Austin, TX
Magna Cum Laude
GPA: 3.93 / 4.0

## TECHNICAL SKILLS

**Programming**
Python • C++ • Matlab • Git • Bash

**Data Analysis**
Pandas • NumPy • SQL

**Machine Learning**
Scikit-Learn • TensorFlow

**High Performance Computing**
Slurm • Google Cloud Platform

## SOFT SKILLS

**Leadership**

**Communication**

**Initiative**

**Collaboration**

**Bilingual**
English • Spanish

## AWARDS

Gordon Wu Fellow | $28,000
Dean of Eng. Grant | $15,000
Hack '69 Award | $10,000
Azure Cloud Computing | $5,000

## LINKS

LinkedIn:// Franjcf
GitHub Portfolio:// Franjcf
Publications: Google Scholar
Media Article: ML + Fluid Dynamics

## EXPERIENCE

**Research Scientist** | PRINCETON UNIVERSITY
2021 - Present | Princeton, NJ
- Developed end-to-end ML models for prediction of stochastic physical processes.
- Leveraged parallel cloud computing to process simulated and experimental data.
- Led international collaborations with Stanford University and E.T.H. Zurich.
- Taught multiple engineering classes and trained incoming graduate students.

**Ph.D. Candidate** | PRINCETON UNIVERSITY
2016 – 2021 (5 Years) | Princeton, NJ
- Designed parallelizable open-source code to simulate fluid flow in soft porous media.
- Developed 6 publications focused on computational physics and machine learning.
- Presented research findings at 12 scientific conferences (4x as featured speaker).
- Secured funding from competitive grants, such as the Azure Cloud Computing Award.

**Research Assistant** | THE UNIVERSITY OF TEXAS AT AUSTIN
2014 – 2016 (2 Years) | Austin, TX
- Researched novel water desalination technologies through microfluidic experiments.
- Reported findings to the project's business partner, "Okeanos Technologies".
- Obtained and analyzed data in order to set personal and group objectives.

## MACHINE LEARNING PROJECTS

**Natural Language Processing** | CONTEXT ANALYSIS, SPEECH SYNTHESIS
- English language translation with Transformers (Neural Networks + Attention).
- Performed product sentiment analysis of Amazon customer reviews.
- Conducted feature and "trendability" analysis of trending YouTube videos.

**Time Series Forecasting** | TENSORFLOW, DEEP LEARNING
- Prediction of commodity prices through LSTM Recurrent Neural Networks.

**Image Processing** | PYTHON, SCIKIT-LEARN, PANDAS, NUMPY
- Evaluated the efficiency of face-recognition algorithms through PCA.
- Implemented Kernel SVMs for the identification of handwritten digits.

**Miscellaneous Projects** | C++, OOP, VECTOR CALCULUS, STATISTICS
- Optimized latent user classes based on 60,000 dating profiles through LDA.
- Performed unconstrained optimization of ridge regression using gradient descent.
- Modeled and predicted stochastic clogging processes in randomly-generated porous media with Extremely Randomized Trees and Neural Networks.

## LEADERSHIP AND COMMUNITY SERVICE

**Organizer and Teacher** | ACADEMIC SERVICE AND LEADERSHIP
2016 – Present (5 Years) | Princeton, NJ
- Organized four scientific conference sessions, each with over 100 participants.
- Taught Python programming for Stanford's "Code in Place" class in 2020 and 2021.
- Reviewer for *Physical Review Journals*, *Journal of Computational Physics*, *Journal of Fluid Mechanics*, *Transport in Porous Media*, and *Water Resources Research* (among others).

**President** | CATHOLIC ORGANIZATIONS
2014 – Present (7 Years) | Austin, TX and Princeton, NJ
- Organized weekly events attended by over 120 people.
- Directed yearly 70-person, 5-day community service mission trips in Austin TX.
- Coordinated yearly 350-person Easter pilgrimages through Austin, TX.
- Arranged and secured funding for monthly community service activities.