

Francisco J. Gonzalez

Data Scientist, Strong Analytics

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Education

- 2016–2018 **M.Sc.**, *University of Illinois at Urbana-Champaign*, Aerospace Engineering.
Adviser: Maciej Balajewicz
Thesis: “Learning low-dimensional feature dynamics using convolutional recurrent autoencoders”
- 2012–2016 **B.Sc.**, *University of Illinois at Urbana-Champaign*, Aerospace Engineering.
Cum Laude, Minor: Computational Science & Engineering

Experience

- 2019– **Data Scientist**, *Strong Analytics*, Chicago, IL.
- Present Data science consulting and machine learning development.
- Designed and developed computer vision solutions used to help keep children safe online from cyberbullying and other potentially harmful situations
 - Developing 3D computer vision applications to help global shipping companies optimize last-mile logistics
- 2018–2019 **Data Scientist - Computer Vision**, *CCC*, Chicago, IL.
- AI-enabled vehicle collision estimating tools.
- Developing deep learning tools that leverage photos and telematics data for vehicle claims automation.
- 2016–2018 **Graduate Research Assistant**, *University of Illinois at Urbana-Champaign*.
- Data-driven methods in computational science.
- Developed deep learning based, completely data-driven nonlinear model reduction strategy.
 - Currently researching applications of deep learning to modeling complex dynamical systems.
- Summer **Research Intern**, *Mitsubishi Electric Research Laboratory*, Cambridge, MA.
- 2018 Optimal sensor placement for state estimation.
- Developed optimal sensor placement algorithm for state estimation of large thermo-fluid systems.
 - Implemented iterative solvers for large-scale matrix equations used in estimation.
- Summer **Computational Physics Fellow**, *Los Alamos National Laboratory*.
- 2016 Quinoa: Adaptive Fluid Dynamics
- Contributed to the development of Quinoa, a fully asynchronous distributed-memory parallel finite element solver using unstructured grids.
 - Implemented load-balancing capabilities on the finite element solver using the Charm++ runtime system.

2015–2016 **Blue Waters Research Intern**, *National Center for Supercomputing Applications*, Urbana, IL.

Computational bio-fluid mechanics

- Utilized the petascale supercomputer, Blue Waters, to investigate and develop residual-based turbulence models applicable to arterial blood flow.
- Designed and ran simulations investigating intracranial blood flow during +Gz accelerations.

Software

Languages & **Programming**

Frameworks ◦ Python, C/C++, MATLAB, Fortran 90

Machine Learning/Deep Learning

◦ TensorFlow, Keras, Scikit-learn, AWS SageMaker

Big Data

◦ PySpark

High Performance Computing

◦ OpenMP, MPI, CUDA, Charm++

Open-source *nMOR: neural Model Order Reduction*

Packages ◦ Deep learning based package for nonlinear model order reduction written in Python and Tensorflow, available on Github.

Publications

2018

1. **Gonzalez, F.**, Balajewicz, M. (2018) Deep convolutional recurrent autoencoders for learning low-dimensional feature dynamics of fluid systems, *arXiv preprint arXiv:1808.01346*. (Submitted to *Int J Num Meth Fluids*)

2016

1. **Gonzalez, F.**, Rogers, B. (2016) Asynchronous Navier-Stokes solver for unstructured grids using overdecomposition, Los Alamos National Laboratory Tech. Rep. LA-UR-16-27258, 104-124.

Conference Proceedings

2017

1. Bakosi, J., Bird, R., Junghans, C., Pavel, R., Waltz, J., **Gonzalez, F.**, Rogers, B. (2017) Quinoa: Adaptive Computational Fluid Dynamics, 15th Annual Workshop on Charm++ and its Applications, Urbana, IL.

2016

1. **Gonzalez, F.** (2016) Numerical simulation of highly pulsatile blood flow through idealized femoral artery bifurcations, 2016 Undergraduate Research Symposium, Urbana, IL.

2015

1. **Gonzalez, F.** (2015) Gain scheduling approach to variable pitch vertical axis wind turbines, 2015 SAEOPP McNair/SSS Scholars Research Conference, Atlanta, GA. (2nd Place Oral Presentation Award)
2. **Gonzalez, F.** (2015) Parallelized 2D vortex panel model for rotating airfoils, 2015 Undergraduate Research Symposium, Urbana, IL.

Honors & Awards

- 2018–2020 Alfred P. Sloan MPhD Scholar, *UIUC/Alfred P. Sloan Foundation* (declined offer)
- 2016–2018 SURGE Fellowship, *UIUC College of Engineering*
- 2014–2016 Ronald E. McNair Scholar, *UIUC*
- 2015–2016 Blue Waters Fellowship, *National Center for Supercomputing Applications*
- 2013–2016 Edmund J. James Scholar, *UIUC College of Engineering*
- 2014, 2015 Dean's List, *UIUC College of Engineering*
- 2012–2016 President's Award Program Honors Scholarship, *UIUC*
- 2015 David Kuck Computational Science & Engineering Award, *UIUC*
- 2015 La Casa Latina Outstanding Scholar Award, *UIUC*

Teaching

- Fall 2015 **Teaching Assistant**, CSE High Performance Computing Workshop, *NCSA*
- 2013–2014 **Mathematics Tutor**, Office of Minority Student Affairs, *UIUC*