Jeremy Orosco jrorosco@eng.ucsd.edu

Education

University of California, San Diego
Ph.D. Mechanical Engineering March 2016–present
- San Diego Fellowship (Fall 2014–Spring 2018)
- Research interests:
  - nonlocal operators and variable order systems, control and stability, nonlinear/nonconvex optimization, fluid mechanical systems
  - efficient numerical methods for the solution of variable order differential equations
  - generalized variable order models for anomalous electromagnetic dispersion dynamics

University of California, San Diego
M.S. Mechanical Engineering 2016
- San Diego Fellowship (Fall 2014–Spring 2018)
- Courses (GPA: **3.88**):
  - MAE 280 A/B: Linear Systems and Control
  - MAE 288 A: Optimal Control
  - MAE 283 A: System Identification (open-loop)
  - MAE 283 B: Approximate Identification (closed-loop) and Control [Spring 17]
  - MAE 284: Robust and Multivariable Control
  - MATH 271 A/B/C: Nonlinear Optimization (UC/EQC/IEQC)
  - MAE 210 A/B/C: Fluid Mechanics and Hydrodynamic Stability
  - MAE 208: Engineering Mathematics

University of California, San Diego
B.S. Mechanical Engineering 2014
- Provost Honors, Warren College Honor Society
- Selected Courses:
  - MAE 143 A/B/C: Signals, CT/DT Control Systems
  - MAE 144: Embedded Control and Robotics
  - MATH 120 A: Complex Analysis

MiraCosta Community College
A.A. Pre-Engineering 2011
- Medal of Honor Scholarship
- President's List, President's Permanent Honor Roll
- President, Phi Theta Kappa Honor Society
- All California Academic Team

Research Experience

Graduate Student Researcher, Coimbra Energy Group July 2014–present
University of California, San Diego
- Novel research: modeling, control, and stability of nonlocal variable-order mechanical systems

Undergraduate Student Researcher, Coimbra Energy Group 2012–2014
University of California, San Diego
- Clear-sky model development
- Implemented irradiance data weather classification algorithm
- Developed low-cost, self-sustaining portable irradiance sensing/logging station

Independent Researcher, MAE Department Winter 2013–Spring 2013
University of California, San Diego
- Developed novel forecasting method for chaotic determinant time series

Publications

Orosco, J. and Coimbra, C.F.M.: On the Control and Stability of Variable Order Mechanical Systems. Nonlinear Dynamics (2016) **Link** - **PDF**

Manuscript Review

Elsevier's Energy, The International Journal 2014–Present
- Impact factor: 4.844 (2014)

Springer's Nonlinear Dynamics, An International Journal of Nonlinear Dynamics and Chaos in Engineering Systems 2016–Present
- Impact factor: 2.849 (2014)

Elsevier's Chaos, Solitons & Fractals, The interdisciplinary journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena 2016–Present
- Impact factor: 1.611 (2014)

Springer's Journal of Scientific Computing 2016–Present
- Impact factor: 1.946 (2015)

Selected Projects

Self-balancing Robot - MIP
- Individual capstone controls project
- Digital implementation of continuous time modeling and control design

Fly Righting Response Experimentation Device - Fly2R
- Team capstone mechanical design project
- Developed for UCSD's Pharmacology Department for use with experimentation
- Received Departmental Best Project Award

Portable Solar Powered Sensing Station - get(Sol)
- Individual research-based design project
- Self-sustaining/monitoring sensing station, internal web/data management
- 6+ month uninterrupted runtime (unplugged, zero maintenance)

Awards and Distinctions

San Diego Fellowship March 2014
- 4-Year scholarship: tuition and stipend

MAE Departmental Best Project Award: Fly2R Spring 2014
UCSD Alumni Leadership Scholar July 2012
Coca-Cola Scholar March 2010
MiraCosta College Medal of Honor Scholar Apr 2010
MiraCosta College Foundation Scholar June 2010

Technical Skillsets

Programming
- Syntax: Python, Matlab, Mathematica, C/C++, Julia, Git/SVN, LaTeX, Bibtex
- Environment: *nix, Windows

Design and Simulation

- Eagle PCB, Inventor and Autocad, SolidWorks, PTC Creo (Pro/E), Siemens Femap, Ansys (FEA), SolidWorks COSMOS (FEA)

Circuits and Electronics

- PCB (SMD) prototyping and design, SMD hand-soldering
- Signal conditioning, sensing, actuation
- μC: BeagleBone, Arduino, Raspberry Pi

Rapid Prototyping

- Machining, lasercamm

Graphical Design

- Adobe Photoshop and Illustrator

Employment

Controls Engineer (intern) June 2016–December 2016

Cymer / ASML

- Individually undertaken project to research, design, and implement automation upgrades to existing experimental apparatus.
- Machine vision driven feedback loop based on observation of a modulated hydrodynamic instability and multi-stage actuation of an imaging assembly.
- Applied technical skillsets based on project deliverables:
  - mechanical design (5%)
  - software/hardware high and low level interfacing (15%)
  - hydrodynamics and hydrodynamic instabilities (15%)
  - control theory (25%)
  - machine vision (40%)