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: Open-loop System Identification
  - MAE 283 B: Closed-loop System Identification and Approximate Control
  - 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**
- Citation rate: 4.2 x impact factor

Manuscript Review

Elsevier's Energy, The International Journal 2014–Present

Springer's Nonlinear Dynamics, An International Journal of Nonlinear Dynamics and Chaos in Engineering Systems 2016–Present

Elsevier's Chaos, Solitons & Fractals, The interdisciplinary journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena 2016–Present

Springer's Journal of Scientific Computing 2016–Present

AIP's Physics of Fluids 2017–Present

Professional Memberships

Society of Industrial and Applied Mathematics (SIAM) 2017–Present

American Society of Mechanical Engineers (ASME) 2017–Present

Institute of Electrical and Electronics Engineers (IEEE) 2017–Present

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%)