

CITIZENSHIP U.S. Citizen

EDUCATION **University of California San Diego**  
*Ph.D. Mechanical Engineering* March 2016–present  
 - President's Dissertation Year Fellowship (2018–2019)  
 - San Diego Fellowship (2014–2018)  
 - Interests and expertise:

- applied math, control and stability, identification and estimation, nonlinear/nonconvex optimization, fluid mechanical systems, condensed matter systems, radiative mechanics
- predictive analytics with machine learning models / feature engineering
- generalized differential models for anomalous spectroscopic dispersion
- generalized frequency-domain analysis for emergent nonlocal dynamics in many-body systems

**University of California San Diego**  
*M.S. Mechanical Engineering* 2016  
 - San Diego Fellowship (2014–2018)  
 - Courses (GPA: **3.88**):

- MAE 293: Flow Control and Estimation (in progress: Winter 2019)
- 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

EMPLOYMENT	<b>Controls Engineer (intern)</b> June 2016–December 2016 <i>Cymer / ASML</i> <ul style="list-style-type: none"> <li>- Individually undertaken project to research, design, and implement automation upgrades to existing experimental apparatus.</li> <li>- Machine vision driven feedback loop based on observation of a modulated hydrodynamic instability and multi-stage actuation of an imaging assembly.</li> <li>- Applied technical skillsets based on project deliverables: <ul style="list-style-type: none"> <li>- mechanical design ( 5%)</li> <li>- software/hardware high- and low-level interfacing ( 15%)</li> <li>- hydrodynamics and hydrodynamic instabilities ( 15%)</li> <li>- control theory ( 25%)</li> <li>- machine vision ( 40%)</li> </ul> </li> </ul>
PUBLICATIONS	<p>Orosco, J. and Coimbra, C. F. M.: Anomalous carrier transport model for broadband infrared absorption in metals. <i>Physical Review B</i> (2018) <a href="#">Link</a> - <a href="#">PDF</a></p> <p>Orosco, J. and Coimbra, C. F. M.: Variable order modeling of nonlocal emergence in many-body systems: Application to radiative dispersion. <i>Physical Review E</i> (2018) <a href="#">Link</a> - <a href="#">PDF</a></p> <p>Orosco, J. and Coimbra, C. F. M.: On a causal dispersion model for the optical properties of metals. <i>Applied Optics</i> (2018) <a href="#">Link</a> - <a href="#">PDF</a></p> <p>Orosco, J. and Coimbra, C. F. M.: Optical response of thin amorphous films to infrared radiation. <i>Physical Review B</i> (2018) <a href="#">Link</a> - <a href="#">PDF</a></p> <p>Orosco, J. and Coimbra, C. F. M.: On the control and stability of variable-order mechanical systems. <i>Nonlinear Dynamics</i> (2016) <a href="#">Link</a> - <a href="#">PDF</a></p>
CONFERENCES	<p>Orosco, J. and Coimbra, C. F. M.: Thermophysical model for the infrared emissivity of metals. Paper and presentation. <i>AIAA SciTech Forum</i> (2019) <a href="#">Link</a> - <a href="#">PDF</a></p> <p>Orosco, J. and Coimbra, C. F. M.: Causal Models for Gauss-Lorentz Response of Solid Media to Radiative Excitation. Poster session. <i>ASME MEED Conference</i> (2018) <a href="#">PDF</a></p>
MANUSCRIPT REVIEW	<p>Elsevier's <a href="#">Energy</a>, <i>The International Journal</i> 2014–Present</p> <p>Springer's <a href="#">Nonlinear Dynamics</a>, <i>An International Journal of Nonlinear Dynamics and Chaos in Engineering Systems</i> 2016–Present</p> <p>Elsevier's <a href="#">Chaos, Solitons &amp; Fractals</a>, <i>An interdisciplinary journal of nonlinear science</i> 2016–Present</p> <p>Springer's <a href="#">Journal of Scientific Computing</a> 2016–Present</p> <p>AIP's <a href="#">Physics of Fluids</a> 2017–Present</p> <p>Elsevier's <a href="#">Solar Energy</a>, <i>The Official Journal of the International Solar Energy Society</i> 2018–Present</p> <p>The Optical Society's <a href="#">Applied Optics</a> 2018–Present</p> <p>Elsevier's <a href="#">International Journal of Non-Linear Mechanics</a> 2018–Present</p>

PROFESSIONAL MEMBERSHIPS	<b>The American Institute of Aeronautics and Astronautics (AIAA)</b>	2018–Present
	<b>American Society of Mechanical Engineers (ASME)</b>	2017–Present
	<b>Institute of Electrical and Electronics Engineers (IEEE)</b>	2017–Present
	<b>The Optical Society (OSA)</b>	2018–Present
	<b>Society of Industrial and Applied Mathematics (SIAM)</b>	2017–Present
SELECTED PROJECTS	<b>Real Time Solar Power Forecasting</b>	
	<ul style="list-style-type: none"> <li>- In use at large-scale (200+ MW commercial grid supplier) solar power plant</li> <li>- State of the art machine learning models for power output forecasts</li> <li>- Utilizes novel memory-based feature sets generated with cutting-edge mathematics</li> </ul>	
	<b>Real Time Resource to Power Modeling</b>	
	<ul style="list-style-type: none"> <li>- MISO Identification based model of large-scale solar power plant dynamics</li> <li>- Determination of spurious plant operation behaviors based on pre- and post-modeling analysis</li> </ul>	
	<b>Self-balancing Robot - MIP</b>	
	<ul style="list-style-type: none"> <li>- Individual capstone controls project</li> <li>- Digital implementation of continuous time modeling and control design</li> </ul>	
	<b>Fly Righting Response Experimentation Device - Fly2R</b>	
AWARDS AND DISTINCTIONS	<ul style="list-style-type: none"> <li>- Team capstone mechanical design project</li> <li>- Developed for UCSD's Pharmacology Department for use with experimentation</li> <li>- Received Departmental Best Project Award</li> </ul>	
	<b>Portable Solar Powered Sensing Station - get(Sol)</b>	
	<ul style="list-style-type: none"> <li>- Individual research-based design project</li> <li>- Self-sustaining/monitoring sensing station, internal web/data management</li> <li>- 6+ month uninterrupted runtime (unplugged, zero maintenance)</li> </ul>	
	<b>President's Dissertation Year Fellowship</b>	2018–2019
	<ul style="list-style-type: none"> <li>- 1-Year scholarship: tuition and stipend</li> </ul>	
	<b>San Diego Fellowship</b>	2014–2018
	<ul style="list-style-type: none"> <li>- 4-Year scholarship: tuition and stipend</li> </ul>	
	<b>MAE Departmental Best Project Award: Fly2R</b>	Spring 2014
	<b>UCSD Alumni Leadership Scholar</b>	July 2012
	<b>Coca-Cola Scholar</b>	March 2010
TECHNICAL SKILLSETS	<b>MiraCosta College Medal of Honor Scholar</b>	Apr 2010
	<b>MiraCosta College Foundation Scholar</b>	June 2010
	<b>Programming</b>	
	<ul style="list-style-type: none"> <li>- Syntax: Python, Matlab, Mathematica, C/C++, Git/SVN, L<sup>A</sup>T<sub>E</sub>X, Bibtex</li> <li>- Environment: *nix, Windows</li> <li>- Frameworks: XGBoost, SKLearn, Pandas, CVXPY</li> </ul>	
	<b>Data Science</b>	
	<ul style="list-style-type: none"> <li>- Data quality assessment</li> <li>- Feature engineering</li> <li>- Regressive models</li> </ul>	

- Time series analysis

**Design and Simulation**

- Eagle PCB, Inventor and Autocad, SolidWorks

**Circuits and Electronics**

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

**Rapid Prototyping**

- Machining, lasercamm

**Graphical Design**

- Adobe Photoshop and Illustrator