Jamiree Harrison

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Website: https://jamiree.github.io/

CITIZENSHIP: U.S. Citizen

EDUCATION:

University of California, Santa Barbara **2019 - Present**
Ph.D. Mechanical Engineering
- Mechanical Engineering Excellence Fellowship
- GPA: 4.0
- Coursework:
  - ME 203: Operator Theory
  - ME 210 A/B: Numerical Analysis: Matrix Analysis, ODEs, PDEs
  - ME 215 A: Applied Dynamical Systems
  - ME 225EY: Biological Computing
  - ME 225 MM: Mathematical Methods
  - ME 236: Nonlinear Control Systems
  - ME 243 A/B: Signals, CT/DT Control Systems
  - ME 269: Network Systems
  - ECE 283: Machine Learning (Supervised, Unsupervised)
- Teaching Assistantship and Tutoring:
  - ME 14: Statics
  - ME 155a: Control System Design
  - ME 163: Vibrations

University of California, San Diego **2015 - 2019**
B.S. Math – Applied Science
- Chancellor's Associates Scholarship
- Selected Coursework:
  - MAE 101 A: Intro to Fluid Mechanics
  - MAE 108: Probability and Statistics for Engineers
  - Math 103 A: Intro to Abstract Algebra
  - Math 120 A: Complex Analysis
  - Math 142 A/B: Real Analysis
  - Math 154: Intro to Graph Theory
  - Math 171 A: Linear Optimization

GRADUATE RESEARCH:

Biological Control, Computing, and Learning Laboratory **Jan 2020 – Present**
University of California, Santa Barbara
· Designed genetic toggle switch with quorum sensing (GTSQS) for the purpose of optimizing plastic degradation done by bacteria.
· Mathematically modelled the GTSQS switch with a 3-state nonlinear ODE.
· Validated the model by building and testing the genetic toggle switch in *E. coli* and *Pseudomonas-fluorescens SBW25*.

UNDERGRAD RESEARCH:

Delplanque Research Group **June 2018 – Aug 2018**
University of California, Davis (Funded by UC LEADs)
· Carried out numerical simulations of respiratory drug intake in the human trachea using OpenFOAM.
· Found correlations between parameters of the simulated particle injections and the evenness of the particle distributions.

Coimbra Research Group **June 2017 – Aug 2017**
University of California, San Diego (Funded by UC LEADs)

· Conducted research on numerical methods to solve variable order differential equations (VODEs) using MATLAB.
· Devised an efficient numerical method that could solve VODEs 50% faster than conventional methods, so VODE model predictions could be made more quickly, improving the energy efficiency of the system.

Center for Advanced Surgical and Interventional Technology **June 2014 - Aug 2014**
University of California, Los Angeles (Volunteer) **June 2016 - Aug 2016**
· Assisted in the testing of an innovative way to treat prostate cancer known as focal laser therapy.
· Used CAD for the modeling of a human head to test remote trans-oral surgery.
· Developed molds using Solid Works to test the effects of a catheter-fed laser on phantom tissue.
· Compiled lists of potential treatment candidates within the UCLA health database using SQL.

EMPLOYMENT: **Supplemental Instructor** **Sep 2016 - June 2019**
University of California, San Diego
· Facilitated math workshops for college students consisting of tutoring and support to ensure their academic success.
· Worked with professors to develop lesson plans for the facilitation of math workshops that supplemented material from courses.
· Classes Supported: Linear Algebra, Calculus (1,2,3), Pre-Calculus.

PUBLICATIONS: **Harrison, J.**, Yeung, E.: Stability Analysis of Parameter Varying Nonlinear Genetic Toggle Switches Using Koopman Operators. (Accepted to *Mathematics* 2021. In preparation for publication.)

CONFERENCES: **Harrison, J.**, Ruvalcaba, C., Delplanque, J.-P.: Computational Simulations for the Improvement of Respiratory Drug Intake in the Human Trachea
· SACNAS (2018) | UC LEADs Symposium (2019)
· SACNAS Presentation Award
· UC LEADs Symposium Honorable Mention.

Harrison, J., Orosco, J., Coimbra, C.F.M.: Efficient Numerical Methods for Solving Variable Order Differential Equations
· SACNAS (2017) | SCCUR (2017)

AWARDS & DISTINCTIONS:
Mechanical Engineering Excellence Fellowship **2019**
-Funding in the form of a stipend
Chancellor's Associates Scholarship (UCSD) **2015 - 2019**
- 4-year scholarship
University of California's Leadership Excellence through Advanced Degrees Fellowship (UC LEADs) **2017 - 2019**
- Funding in the form of a stipend for 2 Summers of research
- Funding to travel for research conferences.
Fulfillment Fund Scholarship Recipient **2015 - 2019**
- 4-year scholarship in the form of stipend
2018 SACNAS National Diversity in STEM Conference Presentation Award **2018**

TECHNICAL SKILLSETS:

Programming

-Syntax:

- Python
- MATLAB
- Java
- SQL
- HTML
- CSS
- Julia

-Environment:

- Linux
- Windows
- macOS

Machine Learning:

-PyTorch
-SKLearn
-PCA
-Neural Networks
-Clustering: logistic regression, k-means

Bio Lab:

-Cell Cultures
-DNA amplification
-Golden Gate Assembly
-Genetic Circuit Design

Design and Simulation:

-Solid Works
-Meshmixer
-OpenFOAM
-3D printing
-Simulink

Circuits and Electronics:

-µC: Arduino

Graphic Design:

-Adobe Photoshop
-Adobe Illustrator