Jonathan D. Gitzendanner

University of Central Florida | Dept. of Mechanical and Aerospace Engineering
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Research Interests: Nonlinear Systems, Fluid Mechanics, Data-Driven Models, Physics-Informed Machine Learning

Academics

University of Central Florida – Burnett Honors College, College of Engineering and Computer Science
Bachelor of Science in Aerospace Engineering – Expected Spring 2024
GPA: 3.31

Research Experience

Computational Biomechanics Lab (University of Central Florida) – Dr. Luigi E. Perotti ***January 2022-present***
Optimizing of Polo Kayak Design for Drag Reduction – Independent Research

- Creating multiphase fluid dynamics simulations in STAR CCM+ to model the flow around a polo kayak
- Parameterizing the geometry based off distribution of cross-sectional area and 3-dimensional asymmetry
- Analyzing how this distribution can reduce wave drag and improve design

Multiphase Reactive Flow Group (University of Florida) – Dr. Ryan W. Houim ***Summer 2023***

- Modeling explosive dispersal and ignition of an Eulerian compressible polydisperse granular flow
- Developing a neural network model for symbolic regression to discover sparse and explainable functions
- Finding a function to approximate compression wave speed in an Eulerian compressible polydisperse granular flow

Computational Fluid and Aerodynamics Lab (Univ. of Central Florida) – Dr. Michael Kinzel ***January 2021-present***

- Collaborative work with the Computational Biomechanics Group on kayak hydrodynamics
- Experience on several exploratory projects to build familiarity and interest in Computational Fluid Dynamics (CFD)

Project Work

Stress and Strain Calculations on Solar Panel Arrays from RCS Thruster Rarefied Plume Impingement ***Fall 2022***

- Final group project for EAS 4200 – Design and Analysis of Aerospace Structures
- Using a Direct Simulation Monte Carlo (DSMC) approach, plume from a Reaction Control System (RCS) thruster was simulated as it impinged on a solar panel similar in geometry and support to the International Space Station's
- Pressure field was imported into NX NASTRAN for Finite Element Analysis

Knights Experimental Rocketry – IREC Aerostructures Team ***August 2022-present***

- Leading aerodynamic testing, simulation, and validation efforts for the Intercollegiate Rocketry Engineering Competition (IREC) team
- Assisting in the fluid simulations for the propulsion subsystem of the IREC rocket

Skills

- Python Programing Language – Skilled
- STAR CCM+ – Skilled
- OpenFOAM – proficient
- SOLIDWORKS 2021 – proficient
- LaTeX – proficient
- MATLAB –proficient
- Symbolic regression modeling – proficient
- Multiphase flow modeling – proficient
- Kurdish Language – two semesters

Leadership Experience

Burnett Honors College (BHC) Deans Leadership Council – Co-Coordinator ***February 2021-present***

- Selected as the only Freshman to serve as an inaugural member of a council representing the students of the BHC
- Now organizing the 16-member council as we welcome students, families, industry partners, and donors
- Currently serving as one of 2 undergraduate students on the Dean's Advisory Board to shape the future of the college

Central Florida Rowing – Recruitment Chair ***May 2022-present***

- Increasing membership to 33% higher than previous records for a 57% total increase to a team of 63 student athletes
- Navigating National Collegiate Athletic Association (NCAA) regulations on recruitment and maintaining compliance with a Division 1 Women's Rowing team
- Assisting with club operations including major trailer refurbishment and initiating a program to construct a new boathouse

UCF Formula Student – Head of Aerodynamics and Vice President ***January 2021-May 2022***

- Developing the aerodynamic elements of the student-built race car utilizing rigorous testing in CFD
- Leading the manufacturing of all carbon fiber composite components of the race car

Selected Honors and Awards:

Office of Undergraduate Research

- Florida Undergraduate Research Conference (FURC) Travel Award, 2023
- Undergraduate Research Grant, 2022
- Summer Undergraduate Research Fellow (SURF), 2022

The Burnett Honors College

- Burnett Honors College Scholar (Ongoing)
- Alvin Y. Wang Undergraduate Research Scholarship, 2022
- Pham Honors Academic Merit Scholarship, 2021

University of Central Florida

- Conference Registration and Travel award, 2022
- Pegasus Gold Level Academic Scholarship, 2020 – present

Selected Conference Presentations

Gitzendanner, J. D., M.P. Kinzel, and L.E. Perotti. "Optimization of Polo Kayak Design for Drag Reduction". *American Physical Society: Division of Fluid Dynamics Fall Meeting.* November 20-22, 2022, Indianapolis, IN.

Gitzendanner, J. D., M.P. Kinzel, and L.E. Perotti. "Asymmetric Design Parameterization of Small Vessels for Drag Reduction in the Semi-Planing Regime". *Florida Undergraduate Research Conference.* February 17-18, 2023, Miami Gardens, FL.

Teaching & Mentoring Experience

Applications of Calculus in Engineering Lectures ***Spring Semester 2023***

- Volunteered after hearing several questions from engineering students on if the material had any application
- Creating and presenting monthly lectures on applications of calculus in engineering
- Each lecture explores a broad subject in engineering (Fluid mechanics, structural analysis, optimization, and circuits)
- Focus on interdisciplinary applications (i.e., fluid mechanics as it pertains to Civil, Mechanical, Environmental, etc.)

Teaching Assistant: EGN 3321 – Engineering Analysis Dynamics ***Spring Semester 2023***

- Leading transition of course away from traditional homework assignments assigned over McGraw Hill Connect
- Focus on hands-on activities and experiments designed to be no-cost and allow better understanding of course

Teaching Assistant: MAC 2311 – Calculus 1 ***Fall Semester 2022***

- developing lecture series on applications of calculus in engineering
- Tutoring and advising a section of 1,300+ UCF STEM students through Calculus 1

Peer Mentor: Summer Research Academy (Office of Undergraduate Research) ***Summer Semester 2022 & 2023***

- Introducing a group of seven Computer Science and Computer Engineering students to Undergraduate Research
- Moderating discussions on ethics in research with a focus on engineering
- Effectively communicating the resources available to undergraduates conducting research on campus

Undergraduate Teaching Assistant: IDH 1920H – Honors Symposium ***Fall Semester 2021***

- Facilitating and moderating discussions on a diverse range of topics from race and politics to creativity and innovation
- Advising and mentoring a group of 17 honors students through their first semester in college encouraging personal growth and participation in high impact practices such as undergraduate research and study abroad programs
- Preparing first year honors students to meet the needs of employers determined by National Association of Colleges and Employers (NACE) by cultivating their creativity and communication skills

Honors Orientation Ambassador ***Summer Semester 2021***

- Welcoming a group of over 20 first year Aerospace and Mechanical Engineering honors students to the university
- Planning schedules based on incoming credit, career ambition, and extracurricular involvement for each student
- Highlighting opportunities afforded by the university and college departments

Relevant Coursework

- Vibrations and Controls (in progress)
- Heat Transfer (in progress)
- Design and Analysis of Aerospace Structures
- Modeling Methods in Mechanical and Aerospace Engineering
  - Introduction to numerical modeling
- Fluid Mechanics
- Matrix and Linear Algebra
- Differential Equations
- Introduction to Programming in C
- Computational Tools for Research (audited)
  - Introductory course focusing on using the Linux command line and basic data analysis in Python

Professional Membership

- Member of the American Physical Society (APS)
  - Division of Fluid Dynamics (DFD)
  - Division of Soft Matter (DSOFT)
- Member of the American Institute of Aeronautics and Astronautics (AIAA)

Other Selected Awards and Recognitions

Central Florida Rowing

- Athlete of the Year, 2022

Gainesville Fire and Rescue

- Chief's Award of Excellence, 2019

The Boy Scouts of America

- Vigil Honor, 2020
- Eagle Scout, 2018