

AYAAZ YASIN
yasinaaz@mail.uc.edu
Cincinnati, OH

Education	PhD in Mechanical Engineering, University of Cincinnati, Cincinnati, OH	Fall 2024 - present
	MS in Aerospace Engineering, University of Cincinnati, Cincinnati, OH Thesis title: <i>Computational Modeling of Evaporation without Tuning Coefficients</i>	2024
	BS in Mechanical Engineering Technology, Minor in Mathematics University of Cincinnati, Cincinnati, OH Senior project: <i>Aerodynamic Optimization of a Solar Car</i>	2022
	Notable Coursework - <u>Fluids</u> : numerical methods for aerospace fluid mechanics, computational fluid dynamics, modeling and simulation of multi-physics systems. - <u>Mathematics</u> : advanced numerical analysis, partial differential equations & Fourier analysis, complex analysis.	
Research Experience	Graduate Student , lab of Dr. Kishan Bellur UC Lab for Interfacial Dynamics, Department of Mechanical Engineering, University of Cincinnati - Development of a coefficient-free kinetic-theory computational model of liquid-vapor phase change for cryogenic fuels. - Computational investigation of liquid-vapor phase change driven surface-flow phenomena in microgravity using data from ISS experiments.	Fall 2022 - present
	Research Assistant , Simulation Center Department of Mechanical Engineering, University of Cincinnati in collaboration with The Procter and Gamble Company (P&G). - Performed statistical analysis of the accuracy and computational performance of various algorithms used to compute <i>arbitrarily oriented bounding boxes</i> . - Implemented a genetic algorithm to reduce computational time for <i>arbitrarily oriented bounding box</i> calculations.	Fall 2022
Peer-Reviewed Publications	1. U. Chakrabarti, A. Yasin , K. Bellur, and J. Allen, <i>An investigation of phase change induced Marangoni-dominated flow patterns using the Constrained Vapor Bubble Data from ISS experiments</i> , Frontiers in Space Technologies - Microgravity. Volume 4 - 2023, doi: 10.3389/frspt.2023.1263496.	
Conference Presentations	presenters are underlined.	
	5. <u>A. Yasin</u> and K. Bellur, <i>Modeling evaporation without tuning coefficients</i> , 51th Mid-western University Fluid Mechanics Retreat, 12-14 April 2023, Rochester, IN. 4. <u>A. Yasin</u> , K. Bellur, <i>A Numerical Study of Coefficient-free Kinetic Evaporation Modeling in Liquid Hydrogen</i> , 76th American Physical Society Division of Fluid Dynamics Annual Meeting, 19-21 November 2023, Washington, D.C.	

3. **A. Yasin**, U. Chakrabarti, K. Bellur, and J. Allen, *An investigation of Marangoni induced flow in Constrained Vapor Bubble ISS experiments*, 50th Midwestern University Fluid Mechanics Retreat, 13-15 April 2023, Rochester, IN.
2. **A. Yasin**, and K. Bellur, *A CFD model of evaporation in liquid Hydrogen without the need for tuning coefficients*, 75th American Physical Society Division of Fluid Dynamics Annual Meeting, 20-22 November 2022, Indianapolis, IN. (poster)
1. **A. Yasin**, R. Gilligan, D. Heitmeyer, and K. Cohen, *University of Cincinnati Aerial Vehicles (UCAV) Team's solution to the 2022 AUVSI Student Unmanned Aerial Systems competition*, AIAA Region III Student Conference, 23 March 2022, Purdue University, West Lafayette, IN.

Research Projects

- Analysis of rotor-induced vibrations in a UAV arm** Spring 2022
 Advisors: Dr. Milind Jog and Dr. Jay Kim
 - Computational analysis of the airflow in a coaxial prop-rotor and the effects of the flow-induced vibrations in the UAV-arm on lift-performance.
- A comparative analysis of finite-difference schemes for vorticity-transport equations on non-uniform and curvilinear grids** Fall 2021
 Advisor: Dr. Shaaban Abdallah
 - Developed code to compare the efficiency of finite-difference methods on a non-uniform grid to domain transformation methods using curvilinear coordinates.
- Aerodynamic Optimization of a Solar Car** Fall 2021 - Spring 2022
 Advisors: Dr. Muthar al-Ubaidi and Dr. Alex Wouden.
 - Undergraduate Senior Project.
 - Designed the car's body & analyzed its aerodynamic performance using OpenFoam.
 - The project included studying boundary-layer formation and investigating passive methods to reduce drag by relaminarization and delaying flow separation.

Teaching Experience

- As Instructor-of-Record**
3. ENED 1120: Foundations of Engineering Design Thinking II Spring 2024
 2. ENED 1100: Foundations of Engineering Design Thinking I Fall 2023
- Taught two sections of 72 students each semester as the Instructor-of-Record. The courses are required for all first-year undergraduates in the College of Engineering & Applied Science.
 - Managed and mentored a team of two graduate and six undergraduate teaching assistants. Contributed to the development of course materials.
 - Topics covered: engineering design process, project management, statistical models, spatial visualization, flowcharts & visual programming, dimensional analysis, Python, MATLAB, Visual Basic, statics, and models of physical systems (electrical circuits and mass & energy).
1. ENED 1100: Foundations of Engineering Design Thinking I Spring 2023
- Taught the university-level course to a class of 18 high-school students.
- As Undergraduate Teaching Assistant & Peer Mentor**
2. ENED 1120: Foundations of Engineering Design Thinking II Spring 2022
 1. ENED 1100: Foundations of Engineering Design Thinking I Fall 2020, Fall 2021

Honors and Awards

- Graduate**
- Honorable Mention - *UC Excellence in Teaching Award*, 2024.
 - *Travel Grant*, American Physical Society - Division of Fluid Dynamics, 2023.

- *Graduate Incentive Scholarship*, Department of Aerospace Engineering, 2022-2023 and 2023-2024.
- *P&G Simulation Center Student Support Scholarship*, Fall 2022.
- *Graduate Assistant Scholarship*, Department of Engineering & Computing Education, Spring 2023, Fall 2023, and Spring 2024.
- Several conference travel awards by the UC Graduate School, 2022-2024.

Undergraduate

- *Undergraduate Research Fellowship*, UC Office of Research, 2021-2022.
- *Outstanding Senior Award* by the College of Engineering & Applied Science, 2022.
- Dean's list for five semesters.
- *Global Outreach Scholarship*, University of Cincinnati, 2015.

Academic Service

- Served as the *faculty mentor* for students in the First-Year Engineering Program, 2023-2024.

Work Experience

Ohio Innocence Project, Cincinnati, OH Summer 2022
Student Worker, College of Law, University of Cincinnati
- Cataloged and archived case files.

GMI Companies, Lebanon, OH Spring 2021 - Summer 2021
Product Development Engineering Co-op
- CAD and engineering drawings for production parts.
- Worked on over ten products, taking concept designs to final products.
- Prototyped mechanisms and parts to validate design concepts.
- Designed and conducted experiments to characterize materials.

Regal Beloit Corporation, Florence, KY Spring 2019, Fall 2019
Manufacturing Engineering Co-op
- Performed calculations for gear manufacturing.
- Wrote software to generate G-code for CNC control.
- Calibrated torque monitoring systems for large turbines.
- Designed custom torque tools for use on large coupling assemblies.

3D Paradise, New Delhi, India Spring 2018 - Summer 2018
Research and Development Intern
- Worked on the design and development of industrial-grade FDM 3D printers.
- Collaborated with the marketing team on client presentations.

Shaperjet, New Delhi, India Spring 2017 - Summer 2017
Engineering Intern
- Design optimization of FDM printers to improve production quality and efficiency.
- Optimized slicing software to improve compatibility with the company's products.

Student Teams

UC Aerial Vehicles Team Summer 2021 - Summer 2022
President
- Led the student team competing in AUVSI SUAS competition; designing, building, and flying UAVs capable of autonomous flight, aerial mapping, payload airdrop, static & dynamic obstacle avoidance, and object detection, localization, & classification.

- The team placed 9th out of 71 teams and was awarded the safety award.
- Developed the drop-release mechanism design and optimization, flight testing, project planning, design reviews, funding, logistics, and team operations.
- Project partly funded by the *Ohio Space Grant Consortium*.
- Project advisors: Dr. Kelly Cohen.

UC Solar Car Team

Spring 2021 - Spring 2022

Mechanical and Aerodynamics Lead

- Student team competing in the American Solar Challenge, designing, building, and racing a solar-powered car.
- Led the mechanical team during the design of the university's first solar car.
- Established methodology of design reviews and project planning.
- Responsible for overall system design and aerodynamic optimization of the car.
- Project advisors: Dr. Muthar al-Ubaidi and Dr. Alex Wouden.

FlyUC

Spring 2019 - Fall 2020

President and Propulsion Lead

- Student team competed in the GoFly competition. Designed a single-passenger electric VTOL aircraft.
- Oversaw system design and design reviews.
- Worked on the aerodynamic optimization of coaxial propeller systems.
- Project advisor: Dr Shabaan Abdallah.

Membership

American Institute of Aeronautics and Astronautics (AIAA)
American Physical Society (APS)

Computer Skills

Languages: C, C++, Python, VBA, HTML.
Software: MATLAB, Ansys Fluent, SolidWorks, OpenFoam, Star CCM+,
Simcenter 3D, L^AT_EX, Git/GitHub, LabView.

Extra-Curriculars**Hindustani classical music**

- Studying Tabla under Prof. James Feist at the College-Conservatory of Music, University of Cincinnati since 2019.
- Performed at music conferences and recitals at Ball State University, University of Cincinnati, and the Cincinnati Art Museum.

Taekwondo

- 4th dan Kukkiwon black belt.
- Served as the president and a junior instructor of the University of Cincinnati Taekwondo Club, 2020-2022.

Amateur radio

- Technician-class amateur radio operator license, Federal Communications Commission, callsign: KE8WUP;
- Volunteer radio operator for the Queen City Emergency Net (Cincinnati Chapter of the American Red Cross).

Volunteer interviewer for the **1947 Partition Archive**. Conducted interviews of the eyewitnesses of the *Partition of India*, in India and Canada.

Worked as a researcher for visual art exhibition *Interfaces of Being*, presented at the Korean Culture Center, New Delhi, India, researching 18th-century Urdu poetry.