

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.	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 Talks	presenters are underlined.	
	5. <u>A. Yasin</u> and K. Bellur, <i>Modeling of Evaporation in Cryogenic Fuels Without Tuning Coefficients</i> , 35th NASA Thermal and Fluids Analysis Workshop, 26-30 August 2024, Cleveland, OH. 4. <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.	

3. A. Yasin, and K. Bellur, *A Numerical Study of Coefficient-free Kinetic Evaporation Modeling in Liquid Hydrogen*, 76th American Physical Society Division of Fluid Dynamics Annual Meeting, 19-21 November 2023, Washington, D.C.
2. 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.
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.

Conference Posters

presenters are underlined.

2. A. Yasin and K. Bellur, *Modeling of Evaporation in Cryogenic Fuels Without Tuning Coefficients*, 35th NASA Thermal and Fluids Analysis Workshop, 26-30 August 2024, Cleveland, OH.
1. 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.

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.

- 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 <ul style="list-style-type: none"> - 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 <i>Ohio Space Grant Consortium</i>. - Project advisors: Dr. Kelly Cohen.
	UC Solar Car Team Spring 2021 - Spring 2022 Mechanical and Aerodynamics Lead <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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.
Computer Skills	Languages: C, C++, Python, VBA, HTML. Software: MATLAB, Ansys Fluent, SolidWorks, OpenFOAM, Star CCM+, Simcenter 3D, L ^A T _E X, Git/GitHub, LabVIEW.
Extra-Curriculars	Hindustani classical music <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 4th dan Kukkiwon black belt. - Served as a junior instructor and president of the UC Taekwondo Club, 2020-2022.
	Amateur radio <ul style="list-style-type: none"> - Technician-class amateur radio operator license, FCC callsign: KE8WUP; - Volunteer radio operator for the Queen City Emergency Net.
	Volunteer interviewer for the 1947 Partition Archive . Conducted interviews of the eyewitnesses of the <i>Partition of India</i> , in India and Canada. Worked as a researcher for visual art exhibition <i>Interfaces of Being</i> , presented at the Korean Culture Center, New Delhi, India, researching 18th-century Urdu poetry.