IDEAL RAFUNA

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EDUCATION

MASTER OF SCIENCE: AEROSPACE ENGINEERING 12/2024
University of Illinois Urbana-Champaign (UIUC), Urbana Champaign

- Accelerated non-thesis program focused on systems integration and technology management
- Co-authored research in spectral analysis of turbulence, with manuscript submitted to Physics of Fluids.

BACHELOR OF SCIENCE: MECHANICAL AND AEROSPACE ENGINEERING 05/2023
Clarkson University, NY

- Minor in Mathematics
- Inducted into Sigma Gamma Tau Aerospace Honor Society
- Seven times Dean's List

EXPERIENCE

UNIVERSITY FOR BUSINESS AND TECHNOLOGY

Lecturer, Teaching Assistant & Aerospace Laboratory Supervisor 10/2025 to Current

- Designed and delivered influential lectures in Computer Science I, Introduction to Mechatronics, Laboratory 1 (Electrical Science), and Mechatronic Systems (Design and Implementation).Special Topics in Robotics: RL Robot Twin
- Developed lab modules and supervised projects as a TA for Embedded Systems I.
- Supervise the Aerospace Laboratory, a specialized division within the Mechatronics Lab, focusing on UAV design, systems integration, and control research.
- Working on founding DBF Kosovo, pioneering the first AIAA Design-Build-Fly team in the Balkans.
- Mentored interdisciplinary research teams in robotics, automation, and control systems.

UBT LABS

TelloTwin - UAV Digital Twin System 09/2025 to Current

- Developed real-time telemetry and 3D visualization system for DJI Tello drones using FastAPI, React, and Three.js at 20 Hz data streaming rate.
- Engineered robust architecture to enhance system performance and reliability.
- Conducted thorough testing to validate functionality and optimize user experience.

ALBABRIDGE TECH

Founder & Lead Developer 01/2025 to Current

- Founded AlbaBridge Tech, an education technology startup developing BeAlbanian, a gamified AR platform for learning Albanian language and culture.
- Designed and implemented an ecosystem integrating augmented reality (Unity platform), gamification, and speech recognition to promote cultural learning and preservation.
- Built the platform using React, Unity, Supabase, PostgreSQL, and Google Cloud Speech-to-Text for real-time interactivity and data-driven learning analytics.

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Research Assistant (Prof. Leonardo P. Chamorro) 08/2023 to 12/2025

- Conducted spectral analysis of irregularly sampled wind velocity data from multiple U.S. airports
- Developed frequency-domain correlation methods using nonuniform discrete Fourier transform
- Co-authored manuscript on spatial and temporal wind coherence analysis (submitted to Physics of Fluids)

CLARKSON UNIVERSITY

Research Assistant (Prof. Craig Merrett) 08/2022 to 05/2023

- Conducted structural and aerodynamic analyses of butterfly wings using ANSYS Fluent and Structural.
- Utilized ANSYS FEA and Fluent for thorough modeling and analysis.
- Prepared presentations for weekly updates to Professor Craig Merrett.

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN & CLARKSON UNIVERSITY

Teaching Assistant & Tutoring 08/2020 to 12/2024
University of Illinois Urbana-Champaign (UIUC)
Tutor (2024–2025)

- Provided academic support to undergraduate students in Calculus I, II, III, and Differential Equations.
- Assisted students one-on-one and in groups to enhance comprehension and performance in core mathematics courses.

Clarkson University (CU)
Teaching Assistant & Tutor (2021–2023)

- TA and tutor for a wide range of engineering and mathematics classes, including Rigid Body Dynamics, Calculus I, II, III, Differential Equations, Advanced Mathematics, Fourier Series, Thermodynamics, and Aerodynamics.
- Supported instructors in grading, classroom facilitation, exam review, and helping students master complex course materials.

CLARKSON UNIVERSITY

Nasa-Rasc Al Team Leader 08/2022 to 02/2023

- Led collaborative team across partner universities on three continents, including Khalifa University and Royal Melbourne Institute of Technology.
- Managed Thermodynamic subgroup, overseeing project progress reports and coordinating with team leads.

PUBLICATIONS

- Caraway, B., Bogucki, R., **Rafuna, I.**, Reyna, M., Cheng, S., Chamorro, L.P. (2025).
  Frequency-domain correlation of nonuniform time series: Coherence across distant wind stations.
  Physics of Fluids, [Under review].
  Co-authored research analyzing multi-year wind velocity records using nonuniform discrete Fourier transform for spectral correlation and coherence assessment across U.S. airports.
- Rexhaj, Y., Rexhepi, R., Jetullahu, A., **Rafuna, I.** (2024).
  Multispectral Pedestrian Detection in Low-Light Conditions: Infrared, Visible, and Fusion-Based Approaches for CCTV Applications.
  UBT International Conference – Mechatronics, Systems Engineering, and Robotics (MSER Track)
  DOI: **10.33107/ubt-ic.2025.290**
  Developed dual-modality adaptive pedestrian detection framework using YOLOv8 and brightness-guided Weighted Boxes Fusion (WBF) for real-time smart-city surveillance.

TECHNICAL SKILLS

- Python
- TypeScript
- C++
- JavaScript
- React
- Node.js
- FastAPI
- Supabase
- PostgreSQL
- Three.js
- ROS
- SolidWorks
- Simulink
- CATIA
- YOLOv8
- Computer vision techniques
- Digital twin modeling
- UAV telemetry systems
- IoT system design
- Technical writing
- Unity
- ANSYS Fluent

RESEARCH INTERESTS

- Systems Engineering
- Robotics and Automation
- Digital Twins
- UAV Systems
- AI-Based Sensing

HONORS AND LEADERSHIP

- Founder & Lead, DBF Kosovo, First AIAA Design-Build-Fly team in the Western Balkans
- Member, Sigma Gamma Tau, Aerospace Engineering Honor Society