Luis 'Mateo' Gutierrez

+1 (678) 736-1262
luismgutierrez4147@gmail.com

ACCEPTED CONFERENCE PAPERS

Gutierrez, M., Tumuklu, O. (2025). *Characterization of the Compressible Kelvin-Helmholtz Instability*. AIAA SciTech Conference.

WORK EXPERIENCE

CURRENT, FROM JAN 2025 (FT)

HAVA Lab
Graduate Researcher

Facilitated the porting of a C++ library, Hy2Foam, to an updated version of OpenFOAM. Implemented various Riemann solvers into Hy2Foam including HLL, HLLC, AUSM+ and AUSM+UP.

MAR 2023 – AUG 2023 (FT)

3LP Engineering
Structural Engineering Intern

Coordinated with Project Managers, Architects, and other engineering disciplines to accomplish over twenty-five projects valued over $25,000 in a timely and efficient manner. Managed a project portfolio that included structural design and analysis for a variety of residential and commercial projects of various building materials. Utilized AutoCAD to draft structural residential and commercial structural plans and details.

FEB 2023 – MAY 2023 (PT)

Thorben Consulting LLC
Cloud Practioner

Collaborated with a team of four working on an early chatbot prototype that utilizes both Machine Learning and AWS Services. Successfully completed the following courses: AWS Cloud Quest: Cloud Practitioner and AWS Cloud Practitioner Essentials.

GRADUATE RESEARCH

"Nonlinear Modal Stability Formulation for Hypersonic Nonequilibrium Flows"

To explore hypersonic instabilities arising from complex shock wave boundary layer interactions (SWBLI) with varying model geometries, particularly focusing on double wedges and cones. This investigation will utilize open-source computational fluid dynamics software tools such as Gmsh and OpenFOAM.

"Examining Kelvin Helmholtz Instabilities utilizing Riemann Solvers and WENOEXT in OpenFOAM"

Investigating the implementation of the Weighted Essentially Non-Oscillatory (WENO) scheme as well as Riemann solvers in the OpenFOAM solvers `rhoCentralFoam` and `hy2Foam` to validate the effectiveness of WENO and Riemann numerical methods in resolving instabilities for a Kelvin–Helmholtz validation case.

EDUCATION

2020-2024 **Bachelor of Science**
Mechanical Engineering
Rensselaer Polytechnic Institute

2024-2025 **Master's of Science**
Aeronautical Engineering
Rensselaer Polytechnic Institute

HONORS & AWARDS

2019 **Eagle Scout**
Boy Scouts of America

2020-CURRENT **RPI Leadership Scholarships**
Rensselaer Polytechnic Institute

2025 **Pi Lambda Phi Scholarship Key**
Rensselaer Polytechnic Institute

COMPUTER SKILLS

COMPUTATIONAL	OpenFOAM, hy2Foam, Python Matlab, ParaView, GMSH
CAD	NX, Solidworks
MISC	Linux OS, Windows OS, LaTeX
LEARNING SKILLS	OpenFoam Development (C++) FEniCSx, Qiskit

LEADERSHIP EXPERIENCE

AUG 2023 – DEC 2023 (PT)

America Reads
Elementary and Middle School Tutor

Facilitated an afterschool program for middle school students. Provided academic support, engaged in interactive activities, fostered a positive and inclusive environment, and promoted personal growth among the students.

MAY 2022 – DEC 2022 (PT)

Pi Lambda Phi
VP of Housing

Created and prioritized a 100-point list of potential maintenance items for repairs of a 146-year-old house. Led 10 teams of 4 men totaling over 320+ man-hours in 50 designated improvement projects including the reconstruction of a tile ceiling and wooden walkway. Prepared and managed a semi-annual $4000 budget for repairs and renovations.

REFERENCES

Dr. Ozgur Tumuklu

POSITION	Associate Professor
EMPLOYER	MANE Department *Rensselaer Polytechnic Institute*
EMAIL	tumuko@rpi.edu