

Ting-Ying (Rosen) Yu

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Student Status: F1-Visa (International Student)

EDUCATION

Georgia Institute of Technology, Atlanta, GA

August 2019 – Present

Candidate for Bachelor of Science in Electrical Engineering

Expected Graduation: May 2023

- GPA: **4.0 / 4.0** (Graduating with Honors and Research option certificates)
- *Candidate for Computer Science Minor (Intelligence thread)*
- *Candidate Earth and Atmospheric Science Minor (Geophysics thread)*

RESEARCH INTERESTS

Large-scale Scientific Machine Learning, Computational Simulations (Geophysics / Fluid Flows), Robotics, Inverse Problems, Computational Image Processing, Computer Perceptions, Probabilistic Programming, Embedded Coding

RESEARCH EXPERIENCE

Machine Learning in Seismic Monitoring for CO₂ Carbon Capture Storage

Summer 2022 - Present

Undergraduate Research Assistant

Advisor: Dr. Felix Herrmann (Seismic Laboratory for Imaging and Modelling at Georgia Tech)

- Building statistical neural network image classifiers for CO₂ leakage detection with sequential-Bayesian inferencing

Numerical Simulations of Asymmetrical Coronae on Venus

Summer 2022 - Present

Undergraduate Research Assistant

Advisor: Dr. Taras Gerya (Geophysical Fluid Dynamics Group at ETH Zürich Institute of Geophysics)

- Modeling (3D) how crustal- and thermal-heterogeneities affect the interaction between thermal mantle plume and lithosphere affect the symmetry of coronae with the 3D thermomechanical finite-difference code I3ELVIS

NASA SWIM (Sensing With Independent Microswimmers) Robots Development

Spring 2022 - Present

Undergraduate Research Assistant

Advisor: Dr. Azadeh Ansari

- Miniature robot sensor development, control design, and robotics swarm behaviors simulation of underwater robots

Computational Modeling for Mid-Ocean Ridges

Fall 2021 - Present

Undergraduate Research Assistant

Advisor: Dr. Joyce Sim (Sim Lab at Georgia Tech)

- Evaluating the evolution of the global ridge system by considering the processes of melt focusing beneath mid-ocean ridges using two phase flow models

Fire Ant Raft Deformation under Flow

Spring 2020 - Spring 2021

Undergraduate Research Assistant / Hu Lab at Georgia Tech

Advisor: Dr. David Hu (Hu Lab for Biocomotion)

- Investigated ants' active elongating mechanism that helps adapt to fluid flows which may provide insights for designing an intelligent swarm robotic system

Computational Fluid Dynamics Simulation for Pharyngeal Airway

Summer 2020

Remote Undergraduate Research Assistant

Advisor: Dr. Chun-Ming Chen (School of Dentistry at Kaohsiung Medical University in Taiwan (ROC))

- Investigated the correlation between the amount of mandibular setback, and the related changes of the tongue area, pharyngeal area, and pharyngeal airflow velocity.

ASCENT Project 45: Takeoff/Climb Analysis to Support AEDT APM Development

Fall 2019

Undergraduate Research Assistant

Advisor: Dr. Michelle Kirby (Aerospace System Design Lab at Georgia Tech)

- Developed a robust set of recommendations for improved estimation processes for takeoff weight, reduced thrust takeoffs, and departure profiles within AEDT

PUBLICATIONS

- Ko, Hungtang, **Ting-Ying Yu**, and David L. Hu. "Fire ant rafts elongate under fluid flows." *Bioinspiration & Biomimetics* 17.4 (2022): 045007. URL: <https://doi.org/10.1088/1748-3190/ac6d98>
- Chen, Chun-Ming, **Ting-Ying Yu**, Szu-Ting Chou, Jung-Hsuan Cheng, Shih-Chieh Chen, Chin-Yun Pan, and Yu-Chuan Tseng. 2021. "Changes in Tongue Area, Pharyngeal Area, and Pharyngeal Airway Velocity after Correction of Mandibular Prognathism" *Journal of Clinical Medicine* 10, no. 19: 4560. URL: <https://doi.org/10.3390/jcm10194560>

CONFERENCE & TALKS

- [Upcoming] Hungtang Ko, **Ting-Ying Yu**, David Hu. "Collective behaviors of fire ants on the water surface". In: *Society for Integrative and Comparative Biology (SICB) Meeting 2023*. Jan 2023.
- [Upcoming] Anna Gülcher, **Ting-Ying Yu**, Taras Gerya. "The Origin of Asymmetrical Coronae on Venus: Morphology Classification and 3D Thermo-Mechanical Models of Plume-Margin Interactions". In: *American Geophysical Union*. Dec 2022.
- Ting-Ying Yu**. "[Monitoring CO₂ Plume with Sequential Bayesian Inference](#)". In: *The 2022 ML4Seismic Industry Partners Meeting*. Nov 2022.
- Ting-Ying Yu**. "[The Origin of Asymmetrical Coronae on Venus: Insights from topography data and 3D thermomechanical modelling](#)". In: *ETH Zurich Geophysical Fluid Dynamics Seminar*. Sep 2022.
- Ting-Ying Yu**. "Deformation of fire ant rafts under uniform flow". In: *Southeastern regional Society of Integrative and Comparative Biology Conference*. Nov 2020.

THESIS

- Ting-Ying Yu**. "Deformation of fire ant rafts under uniform flow," Georgia Tech Research Option Undergraduate Thesis. 2021.

TEACHING EXPERIENCE

School of Electrical and Computer Engineering at Georgia Tech, Atlanta, GA

Fall 2021

Undergraduate Teaching Assistant (for ECE 2036 - Engineering Software Design)

- Providing course tutoring, holding office hours, and proctoring exams for 10 hours per week for ECE 2036, a course uses C++ to introduce object-oriented programming and embedded system (MBED) to ECE students

College of Computing at Georgia Tech, Atlanta, GA

Spring 2020

Undergraduate Teaching Assistant (for CS 1371 - Computing for Engineers)

- Teaching weekly recitations and creating homework problems for CS 1371, a course uses MATLAB to teach problem solving and coding practices to engineering students and first-time programmers

HONORS & AWARDS

ThinkSwiss Research Scholarship, <i>Embassy of Switzerland in the United States of America</i>	May 2022
President's Undergraduate Research Awards, <i>Georgia Institute of Technology</i>	Aug 2022
President's Undergraduate Research Awards, <i>Georgia Institute of Technology</i>	Aug 2020
Faculty Honors & Dean's List, <i>Georgia Institute of Technology</i>	Aug 2019- Present

VOLUNTEERING

<u>Beyond Taiwan</u> , <i>an International Non-Profit Organization</i>	Spring 2020 – Present
<i>Executive Board's Curriculum Team Lead</i>	
<ul style="list-style-type: none">• Designing and holding online events and workshops with an audience of over 200 people• Implemented a mentor-mentee matching algorithm in Python, which helped over 55% of mentees achieve their goals.	

ORGANIZATIONS & CLUBS

Georgia Tech Indoor Climbing Club @ Stone Summit Atlanta , <i>Atlanta, GA</i>	Fall 2021 – Present
<i>Vice President</i>	
<ul style="list-style-type: none">• Top rope belaying, lead climbing and lead belaying certified at Stone Summit Atlanta• Climbing 10 hours per week and assisting members to get climbing certifications	
Georgia Tech Experimental Rocketry , <i>Atlanta, GA</i>	Fall 2019 – Spring 2021
<i>Structure and Simulation Team for Rubberband Man Rocket – 30K rocket project</i>	
<ul style="list-style-type: none">• Using MATLAB / Python code to simulate rocket's trajectory to 35k apogee and its stability margin• Using CAD drawing to manufacture bulkhead, motor casing, and mechanical staging flanges	

SKILLS

Programming: Python, PyTorch, Java, Julia, C/C++, R, Bash, HTML, JavaScript, MATLAB, Git, Linux, Gen.jl
Software: Processing.js, Paraview, COMSOL Multiphysics, Android Studio, Altera Quartus II, NI LabVIEW, AutoCAD
Hardware: Arduino, Raspberry Pi, ESP32/8266, Digilent Analog Discovery, ARM mbed microcontroller, oscilloscope
Document Preparation Systems: Markdown, LATEX
Languages: English (fluent), Chinese (native), Japanese (beginner), French (beginner)