Curriculum Vita for Allison M. Flores

626 S Van Buren St. Apt 11 linkedin.com/in/allison-m-flores (847) 612-4747
Iowa City IA, 52245 github.com/amflores5 contact@allison-flores.com

OBJECTIVE

Passionate researcher with extensive experience in signal processing and machine learning applications in space physics and chemometrics. Focused on magnetometer signal interference removal from satellite data, aspiring to leverage expertise in signal processing to explore neural signals, contributing to advancements in understanding brain function and enhancing AI structure and implementation.

EDUCATION

University of Iowa, Iowa City, IA

Doctor of Philosophy	Electrical and Computer Engineering	May 2026
Supervisor(s):	Dr. Ananya Sen Gupta and Dr. David Miles	
Thesis:	Removing Unwanted Magnetic Interference in Space Measurements	
Certificate:	Graduate Teaching Certificate, College of Teaching	December 2026
	GPA: 3.52	
Master of Science	Electrical and Computer Engineering	July 2022
Supervisor(s):	Dr. Ananya Sen Gupta	
Thesis:	"Two-Dimensional Gas Chromatography Time-of-Flight Mass Spectrometry (GCxGC-ToF-MS) Data Analysis for Identifying Unknown Persistent Organic Pollutants in Milk Samples"	
Bachelor of Science	Electrical Engineering	May 2021
Minors:	Mathematics, Computer Science	
	GPA: 3.5	

RESEARCH

University of Iowa, Iowa City, IA

PhD Research — August 2022 – Present

- Investigated Swarn-Echo e-POP data to remove reaction wheel signatures in the magnetic field data
- Analyzed laboratory generated data mimicking geophysical, interference, and DC-trend magnetometer signals for algorithm improvement and validation

Master Research with Thesis — August 2021 – July 2022

- Collaborated with the US Food and Drug Administration to analyze GCxGC-tof-MS data of milk samples to identify unknown compounds
- Developed algorithms for sorting mass spectrometry signals and performed machine learning techniques, such as PCA and k-means clustering, to determine dataset trends

Undergraduate Research Assistant — July 2020 – August 2021

- Assessed algorithms for investigating weathering of hydrocarbons from the Deepwater Horizon oil spill
- Investigated GC-MS signals using MATLAB to identify similarities and prepare for MS thesis writing by exploring research concepts

PUBLICATIONS

Full Papers

Biswas, T., MullerDahlberg, F., Kubicek, B., Zelenski, A., Potluri, L., **Flores, A.M.**, Smith, T., Diaz, D., Sen Gupta, A., Basirico, L.M., Armbrust, K.L., Overton, E., "Quantifying the relative weathering of toxic hydrocarbons from the Deepwater Horizon oil spill using peak-cognizant raw GC-MS signal processing," *IEEE Access,* May 2026.

Miles, D.M., Lasko, A., Bounds, S., Blandin, M.J., Broadfoot, R., Hansen, C., Dolan, J., Dvorsky, R., Finley, M.G., **Flores, A.M.,** Greene, K., Hinson, G., … "The MAGnetometers for Innovation and Capability (MAGIC) Technology Demonstration Payload," *Space Science Reviews*, 2025

Finley, M.G., **Flores, A.M.,** Morris, K.J., Broadfoot, R.M., Hisel, S., Homann, J., ... "Enabling In-Situ Magnetic Interference Mitigation Algorithm Validation via a Laboratory-Generated Dataset," *EGUsphere*, 2024

A. Flores, "Two-Dimensional Gas Chromatography Time-of-Flight Mass Spectrometry (GCxGc-ToF-Ms) Data Analysis for Identifying Unknown Persistent Organic Pollutants in Milk Samples." Order No. 29321898, The University of Iowa, United States -- Iowa, 2022.

Abstracts

Finley, M.G., Blandin, M., Hoffmann, A., Washington, A,. **Flores, A.M.,** Strangeway, R.J., Hospodarsky, G.B., Miles, D.M., "Magnetic Characterization and Interference Mitigation for the TRACERS Mission," AGU Fall Meeting Abstracts, 2025.

Blandin, M., Miles, D.M., Lasko, A., Washington, A., Hisel, S., Finley, M.G., **Flores, A.M**., Kletzing, C., Steele, K., Piker, C., Strangeway, R.J., "Initial Results of TRACERS MAGnetometers for Innovation and Capability Technology Demonstration (MAGIC)," AGU Fall Meeting Abstracts, 2025.

Miles D., Sen Gupta A., Dvorsky R.T., Greene K., Finley M., **Flores A.M**., Hansen C., Hisel S., Hogan C., Homann J., Piker C., Narod B.B., Shekhar S., Smith Q., Steele K. "Constellation Ready Magnetometer – A Nanosatellite Fluxgate Gradiometer Payload with Spacecraft Noise Mitigation," AGU Fall Meeting Abstracts, 2022.

Sen Gupta, A., **Flores, A.M**., Miles, D. "Harnessing Spectral Continuity to Isolate Spacecraft Reaction Wheel Signatures in Magnetometer Measurements – Implications for Machine Learning," AGU Fall Meeting Abstracts, 2022.

HONORS AND AWARDS

iREDEFINE Fellow — March 2025

Electrical and Computer Engineering Department Heads Association (ECEDA)

3 Minute Thesis Runner Up — November 2024

PRESENTATIONS

New Orleans, LA — December 2025

AGU

Poster

Signal Processing Techniques to Mitigate Reaction Wheel Interference

Flores, A.M., Sen Gupta, A., Miles, D.M

Washington D.C.

AGU — December 2024

Poster — Reaction Wheel Interference Mitigation within Magnetometer Data Utilizing Harmonic Structures
Flores, A.M., Sen Gupta, A., Miles, D.M

Wallops Island, VA
Heliophysics Technology Symposium — October 2024
Talk — Mitigating Magnetic Interference in Space Science Mission
Flores, A.M., Sen Gupta, A., Miles, D.M

San Francisco, CA
AGU Poster — December 2023
Mitigation of Reaction Wheel Interference and Other Noise Sources in Spacecrafts Using Remote Sensing and Laboratory-Generated Data
Flores, A.M, Finley, M.G., Sen Gupta, A., Miles., D.M.

TEACHING EXPERIENCES

University of Iowa, Iowa City, IA

Linear Systems Discussion Leader — January 2026 – May 2026
Practicum Experience
- Hosted three 50-minute discission sections for Linear Systems each week while posting the notes taken during class
- Created worksheets for in-class discussion usage
- Developed a discrete-time convolution tool to help students visualize the process
- Hosted exam review sessions for further practice while creating study guides for the course material

Cognitive Theories of Learning — August 2025 – May 2026
Practicum Experience
- Held lectures on the the relationship between machine learning and how they relate to the five themes of cogntition.
- Evaluated student presentations

Linear Systems Undergraduate Teaching Assistant — August 2019 – May 2020
- Created homework solutions, conducted office hours, and managed grading for 50 students

Engineering Fundamentals 1: Statics — August 2018 – May 2019
Teaching Assistant
- Taught lectures, organized discussion materials, and assisted with core engineering concepts and simplified approaches to problem solving

PROFESSIONAL EXPERIENCE

Flight Management Systems Intern — May – August 2020
Collins Aerospace, Cedar Rapids, IA
- Studied footprint testing procedures, identified cycle slips, and presented findings to 250 employees

Cabin Hardware Product Line Intern — May – August 2019
Collins Aerospace, Cedar Rapids, IA
- Collected and analyzed product data, refined data management skills, and coordinated SAP efforts

CAMPUS INVOLVEMENT

eGold Mentor — August 2026-Present
- Mentoring sophomore level electrical engineering student to prepare for future endeavors

Graduate Student Senate — February 2026-Present
Senator — Elected Electrical and Computer Engineering delegate representing graduate students

IEEE Eta Kappa Nu — May 2025-Present
President — Reinstated IEEE-HKN Beta Iota Chapter back on University of Iowa Campus

Peer to Peer Mentor — August 2025-Present
Organized by the Graduate College, paired with three new graduate students in multiple disciples to help with transition to grad school

Engineering Student Graduate Council — August 2025-Present
President — Organize social events for engineering graduate students including trivia, pool nights, holiday parties, bingo and more.

Sigma Alpha Iota, — April 2018 – May 2022
Member — Participated in recruitment, service, and fundraising events to promote women in music

Sergeant of Arms — May 2020 – May 2021
Reworked bylaws and facilitated meetings using Robert's Rule of Order

Social Chair — May 2019 – May 2020
Organized social events and collaborated with Phi Mu Alpha

Hawkeye Marching Band — August 2017 – September 2021

Iowa Pep Band — October 2017 – May 2021

TECHNICAL SKILLS

Programming Languages	Python, C++, MATLAB, Java, Ruby on Rails
Software and Tools	SPICE, MATLAB Simulink, LabVIEW, Altium, Keysight Advanced Design System, Multi-Sim
Other Skills	Data analysis, machine learning, signal processing, IoT, RF electronics, software engineering

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

AGU	August 2022 - Present
IEEE	November 2023 - Present
IEEE Eta Kapp Nu	May 2025 - Present
Cognitive Science Society	December 2024 - 2025
American Physical Society	May 2024 - 2025

RELEVANT COURSEWORK

Interdisciplinary Courses	Mathematical Biology I (MATH:5750) Mathematical Biology II (MATH:5760) Cognitive Theories of Learning (PSQF:6281)

	Systems Biology for BME (BME:5435) Special Topics in Physics: Physics of Magnetospheres (PHYS:7905) Process and Design for Satellite and Environmental Sensors (CBE:4460) Nonlinear Dynamics with Numerical Methods (MATH:5600)
Teaching Courses	Teaching & Learning in Higher Education (GRAD:7385) Design of Instruction (PSQF:6205)
Engineering Courses	Wireless Sensor Networks (ECE:5995) Digital Signal Processing (ECE:5460) Machine Learning (ECE:5450) High Performance Computer Architecture (ECE:5320) Intro to Information & Coding Theories (ECE:5520) Power Electronics (ECE:5420) Software Engineering Languages and Tools (ECE:5820) Internet of Things (ECE:5550) Radio Frequency Electronics (ECE:5995) Digital Communications (ECE:5500) Advanced Radio Frequency Electronics (ECE:5995) Advanced Electromagnetic Theory (ECE:5700) Quantum Engineering: Computer and Devices (ECE:5995) Generative AI Tools: ChatGPT and Beyond (ECE:5995)

WORKSHOPS

Negotiation Workshop	March 2025
Mentoring at Iowa	October 2024

REFERENCES

Dr. Ananya Sen Gupta	Primary Thesis Supervisor Email: ananya-sengupta@uiowa.edu
Dr. Matthew Lira	Practicum Leader Email: matthew-lira@uiowa.edu
Dr. David Miles	Funding Supervisor: Email: David-miles@uiowa.edu