

Julia Lee Romero

Boulder, CO

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EDUCATION

University of Colorado Boulder

Ph.D. Student in Computer Science, GPA: 4.00/4.00

– Advised by Prof. Qin (Christine) Lv and Prof. Morteza Karimzadeh

Boulder, CO

2020–Current

University of Texas at Austin

B.S. in Biomedical Engineering with *Highest Honors (top 10%)*, GPA: 3.73/4.00

– Certificate in Computational Sciences and Engineering

Austin, TX

2016–2020

PROFESSIONAL APPOINTMENTS

See “Graduate Research Experience” below for descriptions of each.

University of Colorado Boulder

Research Assistant and Teaching Assistant in Computer Science

Boulder, CO

2020–Current

Nokia Bell Labs

Ph.D. Research Intern

Cambridge, UK

Summer 2023

Stryd (Sports Technology Startup)

Data Science Research Intern

Boulder, CO

Summer 2022

Johns Hopkins University Applied Physics Laboratory

Data Engineering Intern

Boulder, CO

Summer 2020, Summer 2021

SCHOLARSHIPS AND AWARDS

- NSF Industry-University Cooperative Research Center (IUCRC): Personalized Pervasive Intelligence Center *Award for Most Impactful Research (voted on by industry members, out of 30 graduate students)* 2023
- CU Boulder Population Center Travel Grant *to attend ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)* 2023
- Dean’s Summer Research Fellowship, CU Boulder (*\$6,000, 1 award out of 30 students in my PhD cohort*) 2021
- Teaching Assistant Award, CU Boulder Comp Sci Department (*Given to TA PhD cohort for exemplary teaching in post-pandemic transition*) 2021
- Top Teaching Assistant Award, CU Boulder Comp Sci Department (*Given to 8 out of 90 TAs*) 2020
- Early Career Professional Development Fellowship, CU Boulder 2020
- Graduated with University Highest Honors, UT-Austin *for GPA>3.70 and top 10%* 2020
- Finalist in Engineering Research Poster Competition, UT-Austin *Top 5 out of 200+ students* 2019
- University Honors, UT-Austin *for GPA>3.50* 2016–2020
- Engineering Honors Scholarship, UT-Austin *\$40,000+ Merit-based scholarship* 2016–2020
- National Center for Women in Information Technology (NCWIT) Aspiration Award 2016

PUBLICATIONS

1. A. Hoelzemann, **Julia L. Romero**, M. Bock, K. Van Laerhoven, and Q. Lv, “Hang-time HAR: A dataset for basketball activity recognition using wrist-worn inertial sensors”, *Sensors*, vol. 23, no. 13, 2023.
2. **Julia L. Romero** and Q. Lv, “Global impact of COVID-19 pandemic on physical activity habits of competitive runners: An analysis of wearable device data”, *International Journal of Environmental Research and Public Health*, vol. 19, no. 19, 2022.
3. B. Cadenas, J. Fita-Torró, M. Bermúdez-Cortés, I. Hernandez-Rodriguez, J. L. Fuster, M. E. Llinares, A. M. Galera, **Julia L. Romero**, S. Pérez-Montero, and C. Tornador, “L-ferritin: One gene, five diseases; from hereditary hyperferritinemia to hypoferritinemia—report of new cases”, *Pharmaceuticals*, vol. 12, no. 1, p. 17, 2019.

GRADUATE RESEARCH EXPERIENCE

University of Colorado Boulder, Ph.D. Research

Systems Lab, Computer Science and GeoHAI Lab, Geography

Boulder, CO

2020–Current

- Spatiotemporal Representation Learning for Encoding Urban Neighborhoods

I led this research project independently with feedback from advisors. Developing graph model for preserving spatial and temporal contextual information and learning urban representations. Using large heterogeneous geospatial datasets including satellite imagery, street view imagery, and human mobility. *Ongoing project.*

- Addressing wearable device data quality for remote patient monitoring

I independently conceived the project idea, developed it by writing a 2-page technical research proposal, and set up a cross-discipline collaboration between my advisor Dr. Qin Lv and Dr. Susan Moore at CU Anschutz Medical School. Our 3 person team used my proposal as a starting point to write full grant proposals for NSF, NIH, NCI, and internal funding. I wrote several sections including introduction, motivation, previous and related work, and I helped write technical contributions. This project aims to characterize data quality issues, assess downstream impacts, and develop mitigation strategies to aid the design of a quality-aware data analytics pipeline. *Ongoing project.*

- Dataset for basketball activity recognition with smartwatches

I collaborated with researchers at University of Siegen, Germany on this project. I collected and manually annotated wrist-worn accelerometer data from participants playing basketball, and I assisted with writing a dataset paper. Others on my team validated the dataset with a deep learning activity recognition model. *Paper published.*

- Investigating physical activity during COVID-19 with wearable devices

I independently led this project, completed the analysis, and wrote a full journal manuscript, with feedback from my advisor. Utilized data from a wearable footpod company to examine behaviors of runners before and during the pandemic and in comparison to governmental pandemic policies. *Paper published.*

Nokia Bell Labs, Pervasive Systems Group

Research Intern with Dr. Andrea Ferlini, Dr. Alessandro Montanari, and Dr. Fahim Kawsar

Cambridge, UK

Summer 2023

- Measuring Clinical Respiratory Parameters with a Wearable PPG Sensor

I led a research project and generated patent ideas, supervised by a mentor. I determined the technical approach and project scope, designed a study for data collection, and conducted signal processing on raw photoplethysmography (PPG) sensor data in order to extract respiratory signals. My work will be submitted to ACM Hotmobile 2024, and two of my patent ideas are in the pipeline.

Stryd (Sports Technology Startup)

Data Science Intern, Dr. Kun Li

Boulder, CO

Summer 2022

- Predicting Injury in Runners

I led this project (the only data scientist at the company). I conducted data collection, cleaning, visualization on wearable fitness data. I experimented with time-series feature engineering and developed an analytics

pipeline and machine learning models for injury prediction. My model and pipeline were deployed into the Stryd ecosystem.

Johns Hopkins Applied Physics Laboratory

Data Science Intern

Laurel, MD

Summer 2021, Summer 2020

- Process engineering for Social Security Administration

I worked on a large team and developed process metrics for the SSA's disability claims system. My mentor and I created a Django analytics dashboard and visualization functions on the backend, and I created a REST API and endpoint documentation, implemented logging.

UNDERGRADUATE RESEARCH EXPERIENCE

University of Texas at Austin, Undergraduate Research

Human Signals Lab, Dr. Edison Thomaz

Austin, TX

2019–2020

- Predicting outcome of surgery patients

I independently explored data and created machine learning classifiers for predicting surgical outcomes using Fitbit wearable device data from hip and knee surgery patients. I noticed problems in missing data and this project sparked my in addressing data quality problems in wearables data.

Biomaterials Lab, Dr. Elizabeth Cosgriff-Hernandez

2018–2019

- Fabrication of a hydrogel dressing for chronic wound healing

I worked with a PhD mentor on the development of a hydrogel wound dressing incorporated with active healing factors. I independently wrote image processing programs to automate dead/alive cell counts and calculate porosity, designed and conducted studies to identify the effects of antimicrobial factors on cellular processes.

Tufts University, NSF Research Experience for Undergraduates (REU)

Visual Analytics Lab, Dr. Remco Chang

Cambridge, MA

Summer 2017

- Improve understanding of medical Bayesian-reasoning scenarios

I studied human understanding of Bayesian-reasoning visualizations by different spatial ability of subjects and examined features such as text, plots, and interactivity.

GRANTS

- NSF IUCRC Personalized Pervasive Intelligence Center Project Funding (\$75,000/year) 2023–Current
Project: Graph-based Spatiotemporal and Multimodal Representation Learning for Long-Term Understanding in Human Activity Recognition

Role: I had a 50% contribution towards acquiring this funding with my advisor Morteza Karimzadeh. I conceived the idea, wrote an initial draft of a proposal, and contributed to creating a presentation for acquiring the funding. I also presented a poster on my related work and my work was awarded “Most Impactful” out of 30 student research projects. I contributed to literature review and development of novel techniques for graph learning on spatiotemporal and multimodal data.

SERVICE AND LEADERSHIP

- Student Volunteer at UbiComp, Cancún, Mexico 2023
(ACM International Joint Conference on Pervasive and Ubiquitous Computing)
20+ hours of volunteering for pre-conference and main conference.
- CS Department Peer Mentor, CU Boulder 2020–Current
Mentored 3+ CS graduate students and 3+ undergraduate students applying to graduate school.
- NSF Engineering Research Center (ERC): Advancing Sustainability through Powered Infrastructure for Roadway Electrification (ASPIRE) Institute Student Leadership Council, CU Boulder 2021–2022
Volunteer on ASPIRE's Student Outreach Committee and Student Membership Committee

- e-NABLE Club, UT-Austin 2018–2019
Co-founder, Treasurer, Officer for 3D printing customized prosthetics
- Theta Tau Professional Engineering Fraternity, UT-Austin 2017–2020
Inner Guard (Officer), Recruiting Chair, Tutor, Peer Mentor

TEACHING EXPERIENCE

- **Data Mining** Teaching Assistant, CU Boulder Fall 2022
Mentored students in class projects, course management, helped students in office hours.
- **Data Structures** Teaching Assistant, CU Boulder Fall 2021, Spring 2022
Taught one weekly recitation (40+ students), course management, helped students in office hours, wrote and graded homework and exams.
- **Intro to Computer Science** Teaching Assistant, CU Boulder Fall 2020
Taught three weekly recitations (30+ students), helped students in office hours, wrote and graded homework and exams.

PRESENTATIONS

1. **Julia L. Romero**, Qin Lv, Morteza Karimzadeh, “Representation Learning on Geospatial Data for Encoding Urban Characteristics”, *American Association of Geographers*, Denver, CO, March 2023.
2. **Julia L. Romero**, Ziyang Lan, Ronit Kar, Elizabeth Cosgriff-Hernandez, “Encapsulation of Gallium Maltolate-Loaded Microspheres within Hydrogel Foam Dressing for Improved Chronic Wound Healing”, *Society for Biomaterials Conference*, Rice University, Houston, TX, May 2019.

POSTERS

1. **Julia L. Romero**, Qin Lv, Morteza Karimzadeh, “Representation Learning on Geospatial Data for Encoding Urban Characteristics”, *NSF Personalized Pervasive Intelligence Center Poster Competition*, Boulder, CO, May 2023.
2. **Julia L. Romero**, Ziyang Lan, Ronit Kar, Elizabeth Cosgriff-Hernandez, “Encapsulation of Gallium Maltolate-Loaded Microspheres within Hydrogel Foam Dressing for Improved Chronic Wound Healing”, *Undergraduate Engineering Research Competition*, University of Texas at Austin, Austin, TX, May 2019.
3. **Julia L. Romero**, Jared Chandler, Abby Mosca, Remco Chang, “InfoVis: Interactivity as a Tool to Improve Comprehension of Bayesian Probabilities”, *Tufts University Research Symposium*, Tufts University, Cambridge, MA, August 2017.

SKILLS

- **Programming:** Python, Java, Matlab, C++, C, SQL; Experience with Go
- **Frameworks and Tools:** Pytorch, Keras, Google Cloud Platform, Django, Git, Solidworks; Experience with Spark, Kubernetes, Docker
- **Expertise:** Full-stack data analytics, Mobile/Wearable computing, Signal processing, Graph neural networks, Spatiotemporal and multimodal data methods
- **Related Coursework:** Deep Learning and Neural Networks, Applied Deep Learning, Machine Learning, Big Data Analytics, Data Mining, Datacenter Scale Computing, Advanced Software Development, Network Analysis, Network Systems

PERSONAL INTERESTS

- Competitive endurance sports: Running marathons, Ultramarathons, Mountain running, Gravel and road biking
- Fun Programming: writing Garmin watch apps, smart lightbulb-music interfaces.