Asmitha Sathya

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EDUCATION

Johns Hopkins University - Baltimore, MD 21218

MSE Computer Science *Graduation: May 2026*

BS Computer Science, BS Biomedical Engineering | GPA: 3.70/4.00 *Graduation: May 2025*

Honors: Dean's List, Departmental Honors (CS + BME), General Honors, Linda Trinh Memorial Award

Relevant Coursework: Explainable AI Design & Human-AI Interaction, Human-Robot Interaction, AI-ML for Global Health, Computer Vision, Computational Genomics, Build an Imager, Biomedical Data Science, Signals and Systems, Computational Cardiology, Algorithms, Data Structures, Computer System Fundamentals, Linear Algebra and Differential Equations, Prob/Stats

SKILLS & PROFICIENCIES

Programming Languages: Python, Java, C, C++, C#, R, MATLAB, JavaScript, XAML
Technologies: Git, Docker, Simulink, Visual Studio, CMake, .NET, Linux, Unity, React, Bitbucket, Google Colab, Arduino, Raspberry Pi
Project Management: Helix ALM, Jira, Confluence, Azure DevOps

WORK EXPERIENCE

Software Engineering Intern | *Unity, C#, MATLAB, Simulink, Docker, DDS, Git, Visual Studio* *Jun 2025 - Present*
Medtronic, Boston, MA

- Built MATLAB/Simulink software integration testing simulation for Hugo RAS system, enabling hardware-free integration testing and reducing software validation time by over 90%.
- Designed Unity VR simulation with movement tracking, logging of 9-DOF data, and playback functionality for formative user study.
- Developed mouse-controlled Hugo digital twin in Unity with accurate kinematics and physics movement for engineering purposes.

Software Applications Engineering Intern | *C#, XAML, Figma, .NET, Visual Studio, GitHub* *Jun 2024 - Aug 2024*
Triple Ring Technologies, Newark, CA

- Utilized C# and XAML to develop GUI applications for 2 diagnostic medical devices intended for market release.
- Developed 100 black box and code inspection test cases in Helix for traceability and acceleration of software verification by 50%.
- Enhanced Subversion to GitHub repository migration pipeline for non-standard directories, improving effectiveness by 10%.
- Nominated to attend Stanford Biodesign's rigorous 2024 DxD Healthtech Workshop, engaging with industry leaders.

Data Analytics Intern at National Institute of Standards and Technology | *R, STRmix, ggplot2, Plotly* *Aug 2023 - May 2024*
Dr. Sarah Riman, National Institute of Standards and Technology (NIST), Gaithersburg, MD

- Developed over 30 unique R scripts to curate, analyze, and visualize large-scale forensic DNA profiling data for publication.
- Programmed novel R pipeline that increased speed of labeling and differentiation of allelic and stutter peaks by 90%.
- Presented literature on challenges facing interpretation of casework DNA evidence to NIST experts for scope validation.

RESEARCH EXPERIENCE

JHU Department of Biomedical Engineering Ahn Lab | *R, Python, TCGA, OpenCRAVAT, GDC, SigmaPlot* *Jul 2021 - May 2025*
Dr. Eun Hyun Ahn, Department of Biomedical Engineering, Johns Hopkins University

- Leveraged R and Python to create over 40 data visualizations for analysis and contributed to 2 publications on whole-exome and duplex sequencing of primary and recurrent glioblastoma tumors.
- Utilized GDC API, GeneCards API, and Python to create pipeline to annotate mutations with TCGA data and clinical significance.
- Produced 3 TCGA computational tutorials and taught to 150 students in biochemistry course (CTEI Instructional Enhancement Grant).

JHU Advanced Robotics and Computationally Augmented Environments Lab | *Unity, C#, and Blender* *Sep 2023 - May 2024*
Dr. Mathias Unberath, Laboratory for Computational Sensing + Robotics, Johns Hopkins University

- Developed a programming interface using Unity, C#, and Blender to position a dynamic 3D model of the Loop-X mobile imaging robot along 6 coordinates.
- Reduced integration time of 3D digital twin Operating Room with virtual reality by 15%, enhancing surgical training.

JHU Bioinformatics and Computational Biology Lab | *Biopython, Snakemake, Bowtie 2, Linux* *Jun 2023 - Dec 2023*
Dr. Joel Bader, Department of Biomedical Engineering, Johns Hopkins University

- Employed Biopython and Snakemake in a Unix environment to analyze 177 barcode sequences generated by new multiplex detection of protein-protein interaction technology.
- Optimized mapping of merged and paired-end reads to reference genome, reducing processing time by 20%.

RELEVANT PROJECTS

Multimodal Alerts in Surgical Task Management | *Python, Raspberry Pi, Pygame, Thonny, MicroPython* *Spring 2025*

- Programmed EKG-triggered alert system with 4 alert modalities, integrating hotspot socket communication to control robotic device.
- Conducted a user study during simulated surgical task, logging 1000+ data points from alert system to assess reaction time and accuracy.

Predicting Hemoglobin Levels for Anemia Severity Assessment | *Python, Pandas, PyTorch, OpenCV, scikit-learn* *Fall 2024*

- Developed model for non-invasive anemia diagnosis via cellphone images of patients' palm, fingernails, tongue, and conjunctiva.
- Utilized YOLOv8 and EfficientNet for segmentation and regression in Python to determine hemoglobin level, achieving RMSE of 1.34.

Bone Age Prediction from X-Ray Images | *Python, OpenCV, SciPy, matplotlib* *Fall 2024*

- Utilized InceptionV3 with data augmentation to build a pediatric bone image classification model from 13000 X-ray images.
- Reduced MAE by 55.5% from previously accepted MobileNet model.

Query Ability of Probabilistic Data Structures | *Python, PyProbables, Sourmash API, Sequence Bloom Tree* *Fall 2024*

- Implemented bloom filter, quotient filter, and cuckoo filter manually with faster insertion time than PyProbables library functions.
- Developed efficient k-mer table storage method for large datasets using Sequence Bloom Tree and Sourmash API in Python.

LEADERSHIP & TEACHING EXPERIENCE

Johns Hopkins Design Team (Stomify) - 2024-25 Design Team Co-Leader *Aug 2024 - Present*

Clinical Mentor: Dr. Andrew Cohen, MD, Urology, Johns Hopkins Medicine

- Led cross-functional team of 7 undergraduate students in developing a novel urostomy baseplate and pouch system for leakage management and enhanced clothing adaptability to mitigate current urostomy pouch complications for patients with an ileal conduit.
- Utilized Gantt chart, risk management, and effective delegation practices for project and team management.
- Dedicated 12 months towards design process to validate needs, map to design requirements, and conduct verification/validation.
- Awarded Linda Trinh Memorial Award for diligent efforts to improve the human condition and secured $1000 from Johns Hopkins University Summer Bridge Fund to support project continuation.

Computational Medicine: Cardiology Laboratory Teaching Assistant *Aug 2024 - Dec 2024*

- Instructed 30 undergraduate biomedical engineering students in labs corresponding to analyzing electrocardiogram data, mechanisms that regulate cardiac muscle contraction and relaxation, and baroreceptor control of the cardiovascular system.
- Dedicated 10-12 hours weekly to assist students with comprehending lab concepts and provide feedback on assignments and lab reports.

Johns Hopkins Design Team (LymphaLock) - Prototyping Lead *Aug 2022 - May 2023*

Clinical Mentors: Dr. Clifford Weiss, MD, Interventional Radiology; Dr. David Gage, MD, Radiology, Johns Hopkins Medicine

- Developed a device for interventional radiologists to maintain stable access to the lymph nodes during lymphangiographies.
- Conducted root cause, failure mode, and risk analysis to identify procedural issues and develop design requirements for solution.
- Employed 3D printing, CAD, laser cutting, soldering, and usability testing to design and build 2 functional works-like prototypes.
- Created 3 accurate lymph node polymer models based on extensive research, used for prototype verification and force testing.
- Pava Center's Spark Accelerator Alumni, 2023 Hopkins New Venture Challenge Finalist, 2023 Design Day Presenters

Biomedical Engineering & Design Lab Manager *Aug 2022 - May 2023*

- Instructed 5-10 undergraduate students on foundational biomedical engineering skills including building circuits, programming Arduino, and utilizing bioinformatics software PyMol, Jalview, and Fiji/Image J for cell imaging.
- Guided students in developing a technical solution to a health inequity problem for final presentation project.
- Dedicated 8-10 hours weekly to explaining complex material to students and providing instructional feedback on student reports.

PUBLICATIONS

Riman, S., Bright, J., Huffman, K., Moreno, L., Liu, S., **Sathya, A**., Vallone, P. (2024). A collaborative study on the precision of the Markov chain Monte Carlo algorithms used for DNA profile interpretation. *Forensic Science International: Genetics*. https://doi.org/10.1016/j.fsigen.2024.103088

Ruiz, A.L., Xiao, M., **Sathya, A**., Piccininni, N., Liu, G., Siddiq, N., Chen, H., & McEnnis, K. (2023). Influence of particle z-potential and experimental procedure on protein corona formation and multicomponent aggregation. *AIChE Journal, 69*(12). https://doi.org/10.1002/aic.18237