

ISHA CHAKRABORTY

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ichakraborty.github.io

Digital Health • Computer Vision • Deep Learning • Foundation Models • Accessible Tech

EDUCATION

Ph.D. in Electrical and Computer Engineering, Rice University

2023-2028

Working with Prof. Ashutosh Sabharwal and Guha Balakrishnan

Clinical Collaborators: Baylor College of Medicine

M.S. in Electrical and Computer Engineering, Rice University

2023-2025

Thesis: PARQ: A Deep Learning Based Approach for Automatic Assessment of Motor Disease

Severity in Parkinson's Disease

B.S. in Computer Science, Minor in Information & Data Science, California Institute of Technology

2019-2023

EXPERIENCE

2025 National Institute of Health, National Library of Medicine PhD Fellowship

- Awarded prestigious **Predoctoral fellowship** to fully fund my PhD with Biomedical Informatics & Data Science training, collaborating with the Baylor College of Medicine, Neurology and Neurosurgery

2023 Rice University, MS/PhD Student

- Conceptualized and developed **PARQ**: a first of its kind, **clinically grounded, scalable, and interpretable video deep learning system** for at-home Parkinson's Disease (PD) severity prediction
- PARQ achieves **85%** average agreement with expert clinicians across **fifteen** visually rated motor tasks (**spotlight** at *World Congress on Parkinson's Disease and Related Disorders* (top PD conference) 2025)
- Spearheaded research and engineering for novel machine learning paradigm for learning from multiple noisy annotators, to obtain accurate and robust predictions
- Formulated novel loss function regularizers to balance learning from multiple noisy labels, improving generalizability and reducing bias toward individual annotators, enabling scalable training across diverse raters and clinical sites
- Developed a **foundation model-based** framework for automated behavior monitoring in inpatient suites, enabling **scalable** analysis of clinical activity (selected for **Technical Talk** at AI in Health Conference 2025)
- Led team of **10 engineers** for Audio/Video analysis to design hardware setup and software stack (2024-2025)
- Engineered and deployed a 24/7 in-clinic recording infrastructure integrating wearables and IR-modified cameras to develop the **first naturalistic environment for post-operative monitoring** for Bipolar Disorder
- Founded and presided over the Grad Women+ Group for 2 years and served in the DEI committee

2022 Amazon, Alexa Devices, Software Development Engineer Intern

- Built a Publisher-Subscriber mechanism to publish Alexa device resource updates from multiple devices
- Reduced internal calls to other devices by **50%**, saving projected upwards of 10 ms/call and \$5 mil/year
- Internship outcome: deployed project for validation and planned production in South-east Asia

2021 California Institute of Technology (Caltech), Pachter Lab, Statistical Genetics Intern

- Developed robust pipeline to generate polygenic risk scores from RNA-seq data for early diagnosis of small cell lung cancer with genome wide association studies and expression quantitative trait loci (eQTL) analysis
- Developed workflow to optimize single-cell eQTL analysis to identify gene expression variants
- Recipient of 2-time Carl F. Braun **Summer Undergraduate Research Fellowship**

2018 Stanford University School of Medicine, Plevritis/Pritchard Lab, Computational Biology Intern

- Developed predictive models to detect intron splice sites for multiple cancer diagnosis

PUBLICATIONS (CONTINUED ON NEXT PAGE)

I. Chakraborty, K. Trushenski, S.S. Khan, A. Reynolds, A. Yilmaz, G. Balakrishnan, N. Vangeas-Arroyave, A. Sabharwal.

"Novel Deep Learning Models for Automatic Assessment of Motor Disease Severity in Parkinson's Disease" (World Congress on Parkinson's Disease and Related Disorders, **Spotlight**, 2025)

PUBLICATIONS

I. Chakraborty, T. Frączek, Y. Zhou, R. Bechtold, J. Zhou, S. Chamarthi, S. Soubra, T. Hamre, K. Mansourian, J. H. Bentley, J. Heron, N. Moukaddam, S. Sheth, W. Goodman, N. Provenza, A. Sabharwal. “Automated Behavior Detection for Longitudinal Inpatient Monitoring using Foundation Models” (AI In Health Conference, **Technical Talk**, 2025)

I. Chakraborty, K. Trushenski, S.S. Khan, A. Reynolds, A. Yilmaz, G. Balakrishnan, N. Vangeas-Arroyave, A. Sabharwal. “PARQ: A Deep Learning Based Approach for Automatic Assessment of Motor Disease Severity in Parkinson’s Disease” (in submission, 2025)

I. Chakraborty*, T.P. Kutcher*, K. Kostick-Quenet, A. Sano, N. Moukaddam, J. A. Herron, W. K. Goodman, S.A. Sheth, A. Sabharwal, N.R. Provenza. “Digital biomarkers for passive remote monitoring of bipolar disorder: a systematic review” (in submission, 2025)

I. Chakraborty, A. Trivedi. “Forest Fire Detection Using a Drone”. (NeurIPS Workshop 2017)

SKILLS

Programming Languages: Python, Swift, Java, R, C/C++

Frameworks: PyTorch, TensorFlow, HuggingFace, Scikit-Learn, NumPy, OpenPose, MediaPipe, Foundation models (CLIP, BLIP, LLaMA, GPT)

Design/Visualization: Procreate, Figma, Adobe Illustrator, BioRender, Flask

Other: AWS/EC2, Git, macOS, Linux, Windows, Genome association analysis

Spoken Languages: English (fluent), Spanish (advanced), Bengali (fluent),

AWARDS

- Chosen as Oral Presenter at World Congress on Parkinson’s Disease and Related Disorders 2025
- National Science Foundation, Graduate Research Fellowship Program, Honorable Mention 2024
- IEEE BHI Top Reviewer 2024
- Dean’s Scholarship for Rice University PhD 2023, awarded to one student in cohort
- National Center for Women in Technology Bay Area Winner, Collegiate National Finalist 2022
- Oral presenter at Global IoT Conference and The Data Science Conference 2017

EXTRA CURRICULARS

- Caltech Society of Women Engineers, President (October 2019-2023) of 100 students, secured scholarships for Society of Women Engineers conference for all members
- Teaching Assistant for CS 1 & CS 2 (2020-2023), led recitation sections and held 6-8 independent office hours/week
- President of Grad Women+ Group of Rice ECE (2023-present) of 50 students (95% participation)
- Graduate Admissions Ambassador, ACTIVATE Coach for aiding students with resumes and presentation coaching