

Rahul Islam

<https://rahulislam.com>
rahul@northwestern.edu | (+1) 201 920 0454

FIELDS OF INTEREST

Affective Computing, Mental Health Sensing, Human-Computer Interaction, Machine Learning

EDUCATION

Stevens Institute of Technology | HOBOKEN, USA

PhD | Systems Engineering | 2024 | Advisor: Sang-Won Bae

Indian Institute of Information Technology | GUWAHATI, INDIA

Bachelor | Computer Science | 2017

EXPERIENCE

Northwestern University | Q ENTREPRENEURIAL FELLOW

April 2026 - Present | Chicago, USA

Emory School of Medicine | POSTDOCTORAL FELLOW

Feb 2025 - Mar 2026 | Atlanta, USA

AI/ML in Mobile System for Healthcare

Stevens Institute of Technology | GRADUATE RESEARCH ASSISTANT

Jan 2020 - Dec 2024 | Hoboken, USA

- Led research on AI-driven mental health support systems, developing the 'PupilSense' and 'FacePsy' systems, resulting in a 81% AUROC in depression detection using facial and pupil-based cues.
- Published 10+ papers in top-tier conferences like IEEE BSN, MobileHCI, JMIR, ABC, and CESUN, showcasing advancements in affective mobile sensing.
- Collaborated with interdisciplinary teams to develop and deploy machine learning models in real-world settings, enhancing digital biomarkers for mental illness and substance use disorder.

Egnify | SENIOR SOFTWARE ARCHITECT

Jul 2017 - Aug 2019 | Hyderabad, India

- Spearheaded the development of 5 scalable products for student performance analytics to Digitize. Rate. Forecast. Optimize. Personalize.
- Managed a team of 5 engineers, optimizing software development and machine learning models for predictive analytics, contributing to a 20% increase in student success.

ParallelDots | DATA SCIENTIST

Apr 2017 - Jun 2017 | Gurugram, India

Working with the medical diagnostic team for developing deep-learning learning based medical diagnostic systems for brain hemorrhage.

Brahmaputra Innovative Solutions | SOFTWARE ENGINEER INTERN

May 2015 - Jan 2016 | Guwahati, India

Worked on document management system

PUBLICATION

Journal/Conference/Poster

21. **Rahul Islam***, Jangwon Lim*, Dharini Raghavan, Hyeokhyen Kwon. "Wearable Sensing for Quantifying Cognitive and Balance Functions in Naturalistic Movements of Older Adults with Mild Cognitive Impairment in Therapeutic Environments" PLOS Digital Health 2026 (* = Equal Contribution) (Under Review)
20. Jeremy Bauer, Susan Sienko, Lauhitya Reddy, Vedant Kulkarni, Seth Donahue, Ross Chafetz, Anita Bagley, Joseph Krzak, **Rahul Islam**, Hyeokhyen Kwon. "Clinically Accessible 2D Video Analysis

Accurately Captures 3D Knee Gait Kinematics” Annual Meeting of American Academy for Cerebral Palsy and Developmental Medicine (AAPDM 2026) (Under Review)

19. **Rahul Islam**, Seth Donahue, Jeremy Bauer, Susan Sienko, Anita Bagley, Joseph Krzak, Maura Eveld, Karen Kruger, Ross Chafetz, Vedant Kulkarni, Hyeokhyen Kwon. "Evaluating the Feasibility of Deploying Quantized ViTPose for Mobile Human Pose Estimation on Smartphone for Gait Analysis for children with Cerebral Palsy" Annual Meeting of the Gait & Clinical Movement Analysis Society Conference (GCMAS 2026)
18. Naoto Nishida, **Rahul Islam**, Karan Ahuja. "XDubber: Supporting Non-Native Creators with Explainable Cross-Lingual Video Dubbing" ACM UIST 2026 (Under Review)
17. **Rahul Islam**, Tongze Zhang, Anlan Dong, Melik Ozolcer, Christina Garcia, Milyun Ni'ma Shoumi, Prerna Jamloki, Sozo Inoue, Sang Won Bae. "Summary of the beyondsmile challenge on detecting depression through facial behavior and head gestures" International Journal of Activity and Behavior Computing (2025)
16. Sang Won Bae, Tammy Chung, Tongze Zhang, Anind K Dey, **Rahul Islam**. "Enhancing Interpretable, Transparent, and Unobtrusive Detection of Acute Marijuana Intoxication in Natural Environments: Harnessing Smart Devices and Explainable AI to Empower Just-In-Time Adaptive Interventions: Longitudinal Observational Study" JMIR AI 2025
15. **Rahul Islam**, Tongze Zhang, Sang Won Bae. "MoodCam: Mood Prediction Through Smartphone-Based Facial Affect Analysis in Real-World Settings" IEEE International Conference on Ubiquitous Intelligence and Computing (IEEE UIC 2024)
14. **Rahul Islam**, Vasco Xu, Karan Ahuja. "MotionTrace: IMU-based Field of View Prediction for Smartphone AR Interactions" IEEE International Conference on Wearable and Implantable Body Sensor Networks (IEEE-EMBS BSN 2024)
13. **Rahul Islam**, Tongze Zhang, Priyanshu Singh Bisen, Sang Won Bae. "MoodPupilar: Predicting Mood Through Smartphone Detected Pupillary Responses in Naturalistic Settings" IEEE International Conference on Wearable and Implantable Body Sensor Networks (IEEE-EMBS BSN 2024)
12. **Rahul Islam**, Sang Won Bae. "FacePsy: An Open-Source Affective Mobile Sensing System – Analyzing Facial Behavior and Head Gesture for Depression Detection in Naturalistic Settings" In the Proceedings of the ACM on Human-Computer Interaction (ACM MobileHCI 2024)
11. **Rahul Islam**, Sang Won Bae. "PupilSense: Detection of Depressive Episodes Through Pupillary Response in the Wild" IEEE International Conference on Activity and Behavior Computing (2024)
10. Tammy Chung, Sang Won Bae, Tongze Zhang, Melik Ozolcer, **Rahul Islam**, Anind Dey, Yiyi Ren, Brian Suffoletto, Aidan GC Wright, Trishnee Bhurosy. "Moving Toward Personalized Behavioral Medicine: Integrating Smartphone-based GPS Data into a Digital Alcohol Intervention" Society of Behavioral Medicine/Annals of Behavioral Medicine (2024)
9. **Rahul Islam**, Sang Won Bae. "MicroFlow: Advancing Affective States Detection in Learning Through Micro-Expressions." CESUN (2023).
8. Melik Ozolcer, **Rahul Islam**, Abdullah Mohammed, Tongze Zhang, Sang Won Bae, Ting Liao "Towards Designing Empathetic and Trustworthy AI Chatbots: an Exploratory Study." CESUN (2023).
7. Sang Won Bae, Brian Suffoletto, Tongze Zhang, Tammy Chung, Melik Ozolcer, **Rahul Islam**, and Anind K. Dey. "Leveraging Mobile Phone Sensors, Machine Learning, and Explainable Artificial Intelligence to Predict Imminent Same-Day Binge-drinking Events to Support Just-in-time Adaptive Interventions: Algorithm Development and Validation Study." JMIR Formative Research (2023).
6. Sang Won Bae, Tammy Chung, **Rahul Islam**, Brian Suffoletto, Jiameng Du, Serim Jang, Yuuki Nishiyama, Raghu Mulukutla, and Anind Dey. "Mobile phone sensor-based detection of subjective cannabis intoxication in young adults: A feasibility study in real-world settings." Drug and Alcohol Dependence (2021).
5. Karan Ahuja, **Rahul Islam**, Varun Parashar, Kuntal Dey, Chris Harrison, and Mayank Goel. "EyeSpyVR: Interactive Eye Sensing Using Off-the-Shelf, Smartphone-Based VR Headsets." ACM IMWUT/Ubicomp (2018).
4. Karan Ahuja, **Rahul Islam**, Ferdous Barbhuiya, and Kuntal Dey. "CNNs for Ocular Smartphone-Based Biometrics." Pattern Recognition Letters Journal (PRL) (2017).

3. Utkarsh Dwivedi, Karan Ahuja, **Rahul Islam**, Seema Nagar, Ferdous Barbhuiya, and Kuntal Dey. "EyamKayo: Interactive Gaze and Facial Expression Captcha." In Proceedings of Intelligent User Interface (ACM IUI) (2017).
2. Karan Ahuja, **Rahul Islam**, Ferdous Barbhuiya, and Kuntal Dey. "A Preliminary Study of CNNs for Iris and Periocular Verification in the Visible Spectrum." In Proceedings of 23rd International Conference on Pattern Recognition (ICPR) (2016).
1. **Rahul Islam**, Karan Ahuja, Sandip Karmakar, and Ferdous Barbhuiya. "SenTion: A framework for Sensing Facial Expressions." (arXiv preprint arXiv:1608.04489)(2016).

Workshop

1. **Rahul Islam**, Sang Won Bae. "Revolutionizing Mental Health Support: An Innovative Affective Mobile Framework for Dynamic, Proactive, and Context-Adaptive Conversational Agents." ACM IMWUT/Ubicomp, GenAI4PC Symposium (2023).

AWARDS

- 2025 - Outstanding Doctoral Dissertation Award in SSE Doctoral Program
 2024 - Academic Achievement in SSE Doctoral Program
 2014 - Chief Minister Award Meritorious Student of Assam

SCIENTIFIC REVIEWING

ACM IMWUT/Ubicomp	2022, 2023, 2024, 2025, 2026
ACM CHI	2024, 2025, 2026
ACM UIST	2024, 2025
OzCHI	2024
Elsevier CVIU	2017

ACADEMIC SERVICE

Technical Program Committee , IEEE-EMBS BSN	2025
Program Committee and & Challenge Organizer , Activity and Behavior Computing	2025

TEACHING EXPERIENCE

- **Introduction to Machine Learning**, Guest Lecture & Evaluator, Emory University (2025)
- **Fundamentals of Quantitative Software Engineering**, TA, Stevens (2024)
- **Decision Making Via Data Analysis Techniques**, Guest Lecture, Stevens (2024)
- **Data-Mining and Applied Machine Learning**, TA, Stevens (2024)
- **Informatics for Engineering Management**, Guest Lecture, Stevens (2023)
- **Fundamentals of Software Engineering**, TA, Stevens (2023)

TALKS

Emory University Low Burden Passive Physiological Sensing for Mental Health Monitoring	2025
Nokia Bell Labs Affective Mobile Computing for Mental Health Sensing	2024
Northwestern University Low Burden Passive Physiological Sensing for Mental Health Monitoring	2024
Stevens Tech Designing Deployable Mobile Passive Sensing System and Predicting Depression in the Wild	2023

SELECTED PRESS COVERAGE

WIRED Depression can be detected simply by looking at a smartphone; new technology reveals its hidden potential	2024
Neuroscience News AI Detects Depression Through Eyes and Facial Cues	2024
Modern Optometry Cataract Patients Looking to Avoid Surgery? - Significant Findings	2024
Medical Xpress AI-powered apps show potential for detecting depression through eye snapshots	2024
News Medical Smartphone-based AI systems track subtle facial, pupil signals to identify depression	2024
Science Daily When detecting depression, the eyes have it	2024
Hindustan Times You smile more when you're depressed: Pilot AI-powered apps can detect depression early ...	2024
StudyFinds.org Sad eyes are real – Apps may soon recognize depression in your face	2024
New Scientist AI can detect if you have recently smoked cannabis	2023
Forbes Your Smartphone Can Tell If You're High On Marijuana, Study Finds	2021