Anarghya Das

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Education

University at Buffalo (UB), The State University of New York — Buffalo, NY
Ph.D. in Computer Science; ***GPA: 3.63/4.00****; Supervised by Dr. Wenyao Xu* — *Aug 2021 – Present*
B.S. in Computer Science & B.A. in Mathematics; ***GPA: 3.71/4.00*** — *Aug 2017 – May 2021*

Research Interests

My research focus centers on advancing and implementing wearable technology-driven solutions in healthcare, often called Smart Health. Specifically, I delve into Mobile Computing and Brain-Computer Interfaces (BCI), where I aim to innovate at the intersection of neuroscience and technology.

As a BCI researcher, I conceptualize, design, implement, and evaluate comprehensive BCI systems. My exploration spans various innovative applications within this field. Notably, I have delved into EEG compression techniques in wearable computing and into the fusion of EEG and voice data to amplify the capabilities of Automatic Speech Recognition (ASR) systems. These endeavors aim to bridge the divide between physiological signals and machine learning algorithms, fostering more effective healthcare solutions.

Beyond BCI, I have actively contributed to projects to enhance healthcare technologies and rehabilitation experiences. For instance, in the mRehab project, I engineered a system that integrates smartphone apps and 3D-printed household items to assist stroke survivors in remote home-based therapy. Similarly, in MidiGait, I designed a system utilizing smart insoles and smartphone technology to facilitate melodic gait rehabilitation in Parkinson's patients. Furthermore, my involvement in the Sense2Quit project entailed exploring the potential of mobile health technology in smoking cessation interventions for individuals living with HIV.

Honors & Awards

- **Excellence in Teaching Award for Graduate Teaching Assistants**: Recognizes outstanding performance and dedication in teaching at the graduate level.
- **IEEE Engineering Projects in Community Service (EPICS) award**: Grant for a project focusing on fusing brainwave and voice data for a better understanding of user intention.

Publications

1. **Anarghya Das**, J. Feng, M. Brin, P. Cioe, R. Schnall, M-C Huang, W. Xu, "Enhancing Smoking Gesture Recognition: A Robust Cross-Platform Solution with Sense2Quit", *Journal of Medical Internet Research* [**JMIR**], doi: 10.2196/preprints.67186 **(Submitted)**
2. R. Schnall, M-C Huang, M Brin, P. Cioe, J Liu, **Anarghya Das**, S Fontalvo, W. Xu, "Feasibility and Acceptability of the Sense2Quit App for Improving Smoking Cessation in Persons Living with HIV", *AIDS and Behavior* [**AIBE**] **(Submitted)**
3. **Anarghya Das**, P. Soni, M.-C. Huang, F. Lin, and W. Xu, "Multimodal speech recognition using EEG and audio signals: A novel approach for enhancing ASR systems", *Elsevier Smart Health* [**SH**], vol. 32, p. 100477, Jun. 2024, doi: 10.1016/j.smhl.2024.100477
4. **Anarghya Das**, W. Xu, "Towards Analysis-aware EEG Compression in Wearable Computing", *IEEE International Conference on Wearable and Implantable Body Sensor Networks* [**BSN'23**], Boston, MA, USA, October 2023, doi: 10.1109/BSN58485.2023.10331060
5. T. Chen, A. Gherardi, **Anarghya Das**, H. Li, C. Xu, and W. Xu, "VANet: An intuitive light-weight deep learning solution towards Ventricular Arrhythmia detection", *Elsevier Smart Health* [**SH**], vol. 28, p. 100388, Jun. 2023, doi: 10.1016/j.smhl.2023.100388
6. Prabir Kumar Das, **Anarghya Das**. "Prediction, Risk Assessment and Comparison of Selected Emerging Markets' Stock Indices During COVID-19 Pandemic Using the Coherent Measure", *The Journal of Prediction Markets*, vol. 16, no. 3, pp. 81–97, Feb. 2023, doi: 10.5750/jpm.v16i3.1974.
7. H. Li, H. Chen, C. Xu, **Anarghya Das**, X. Chen, Z. Li, Jian Xiao, M-C Huang, W. Xu. "Privacy computing using deep compression learning techniques for neural decoding", *Elsevier Smart Health* [**SH**], vol. 23, p. 100229, Mar. 2022, doi: 10.1016/j.smhl.2021.100229.

8. P. K. Das, **Anarghya Das**. "Application of nonlinear stochastic single source of error state space models in the forecasting of mobile subscribers in India", *International Journal of Data Science*, vol. 5, no. 4, pp. 333–357, June 2021, doi 10.1504/IJDS.2020.115874

Teaching Experiences

CSE 421: Operating Systems *Aug 2022*
Graduate Teaching Assistant
CSE 341: Computer Organization *Aug 2021*
Graduate Teaching Assistant
CSE 365: Computer Security *Aug 2020*
Undergraduate Teaching Assistant
MTH 141: College Calculus 1 *Jan 2020*
Undergraduate Teaching Assistant

Mentoring Experiences

I have mentored five undergraduate students and six graduate students.

Puru Soni (Undergrad, CSE@UB, co-authored CHASE'24)
Juntao Feng (Undergrad, CSE@UB, project: Sense2Quit)
Jiawei Wu (Undergrad, CSE@UB, project: Sense2Quit)
Alexander Gherardi (Undergrad, CSE@UB, project: TinyML)
Jacob Derby (Undergrad, Mechanical Engineering@UB)
Tianyu Chen (Masters, CSE@UB, project: TinyML)
Shreyas Vedanta (Masters, CSE@UB, project: MidiGait)
Rishabh Kumar (Masters, CSE@UB, project: MidiGait, current: Dell)
Vineet Jain (Masters, CSE@UB, project: MidiGait, current: Amazon)
Soham Patel (Masters, CSE@UB, project: MidiGait, current: Google)
Manasa Sai Challa (Masters, CSE@UB, project: MidiGait, current: Moody's Analytics)

Grant Experiences

IEEE Engineering Projects in Community Service (EPICS) | *Grant Author*
- Requested a $1420 budget for the project titled *MindVoice: Implementing EEG-Enhanced Voice Assistance for Older Adults* from 03/01/2023 to 03/27/2024.

National Science Foundation (NSF-DST) | *Grant Assistant*
- Requested a $600K budget for the project titled *Exploring Early Signs of Speech and Language Disabilities in Low-Resource Language Speaking Children via Radio-Frequency Sensor Technologies* from 02/15/2024 to 02/14/2027.

Internship Experiences

Center for Nursing Research (UB) Buffalo, USA
Undergraduate Senior Research Aide *November 2020 – May 2021*
- Developed an app-based mindfulness solution to reduce the stress and anxiety that nurses go through during the global pandemic.

Research and Economic Development (UB) Buffalo, USA
Lead Android Developer *March 2020 – November 2020*
- Led a team of student developers to create PocketCare S, an application to monitor social distancing in organizations/workplaces.
- Researched ways to make the application secure, accurate, and reliable which led to a lot of interest from various organizations to adopt the application.
- Participated in IBM Call for Code 2020 and presented PocketCare S at IBM Z Day 2020 developer conference.

Advance2000 Buffalo, USA
Technical Development Support Intern *May 2019 – December 2019*
- Built a portal for Customers and Administrators to manage their Microsoft Partner Center Accounts. This improved customer experience and the time efficiency of administrators.
- Contributed to improving the Microsoft Partner Center API by sharing logs and feedback.

Indian Space Research Organization (ISRO) Kolkata, India
Android Developer Student Intern *May 2018 – July 2018*
- Created an Android application to prevent dangerous railway accidents. The application tracked the train's location in real-time and provided feedback to prevent any unforeseen accidents, which reduced accidents related to bad weather.

Community Services & Outreach Activities

Community Service

- Volunteered as a mentor and judge at UB Hacking, guiding students on their hackathon projects and selecting top projects for prizes.
- Organized UB CSE Kid's Day, introducing students from grades K-12 to technology through interactive projects and engaging presentations.
- Assisted high school students in learning Math and Computer Science. Developed games using Scratch, which helped students learn introductory concepts of Computer Science and gain further interest in STEM.

Reviewer

- IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI) [2024]
- IEEE-EMBS International Conference on Body Sensor Networks: Sensor and Systems for Digital Health (BSN) [2023]
- IEEE Internet of Things Journal (IOTJ) [2023, 2024]

Presentations

IEEE Chase'24 (Paper) *June 2024*
Multimodal speech recognition using EEG and audio signals: A novel approach for enhancing ASR systems

IEEE BSN'23 (Poster) *Nov 2023*
Towards Analysis-aware EEG Compression in Wearable Computing

UB Blackstone LaunchPad (Pitch) *Oct 2023*
MindVoice: A wearable device for empowering elders

UB Blackstone LaunchPad (Pitch) *Nov 2022*
MidiGait: Melodic Gait Rehabilitation using Smart Insole

Organizations

Institute of Electrical and Electronics Engineers (IEEE) *Jan 2023 – Present*
Student Member

Tau Beta Pi *Jan 2020 – Present*
Member

UB CSE Student Advisory Board (SAB) *Aug 2020 – May 2021*
President

UB ACM *Aug 2020 – May 2021*
Vice President

UB Hacking *Dec 2019 – Dec 2021*
Organizer

UB Campus Living *Aug 2018 – Dec 2021*
Resident Advisor