

Ranak Roy Chowdhury

[Portfolio](#) | [Google Scholar](#) | [Github](#) | [LinkedIn](#) | ranakrc@gmail.com | (858) 247-9435

SUMMARY

Researcher working on self-supervised learning for sensory data in Human Motion, Healthcare, Audio & Speech.

WORK EXPERIENCE

- | | | |
|---|---|----------------------------|
| Amazon Web Services, Inc. | Applied Scientist II Intern | Jun 2023 – Sep 2023 |
| <ul style="list-style-type: none">Developed an LLM with music integration that generates text responses, including music genre, instruments used, mood, and theme, based on music files. Used Encodec audio features in conjunction with FLAN-T5 LLM. [Link] | | |
| Qualcomm, Inc | Research Fellow | Oct 2022 – Sep 2023 |
| <ul style="list-style-type: none">Developed physics-informed generation model with real-time development on edge devices and text-based contextual knowledge driven framework to enhance zero-shot learning in Human Activity Recognition. [Link] | | |
| Amazon Web Services, Inc. | Applied Scientist II Intern | Jun 2022 – Sep 2022 |
| <ul style="list-style-type: none">Built an accent-robust speech pre-trained model, improving Speech Recognition by 20.4% and Speaker Verification by 6.3%, across 12 minority accents. Used Domain Adversarial Training with Contrastive Learning on HuBERT. [Link] | | |
| Nokia Bell Labs | Data Science Intern | Jun 2021 – Aug 2021 |
| <ul style="list-style-type: none">Developed an ML pipeline to automate ticket resolution. Conducted data cleaning, preprocessing, visualization on time-series semi-structured system-level log corpus, followed by statistical feature extraction and classification. [Link] | | |
| Amazon Web Services, Inc. | Software Development Engineer Intern | Jun 2020 – Sep 2020 |
| <ul style="list-style-type: none">Built a SHAP-based ML Interpretability framework for AWS Redshift, enabling users to write SQL queries to introspect ML model predictions. Improved query execution speed by 2x and memory footprint by 90%. [Link] | | |

EDUCATION

- | | |
|---|---------------------------------------|
| PhD in CS - University of California San Diego | Sep 2019 – Jun 2024 (Expected) |
| <i>Thesis:</i> Robust and Data-Efficient Learning for Time-series | |
| <i>Research Interests:</i> Time-series, Speech, Music, Healthcare, IoT, Sensor Fusion, Spatio-temporal data | |
| MS in CS - University of California San Diego | Sep 2019 – Jun 2022 |
| BSc in CSE - Bangladesh University of Engineering and Technology | Jul 2014 – Oct 2018 |

SELECTED PUBLICATIONS

- Xiyuan Zhang, **Ranak Roy Chowdhury**, Rajesh K. Gupta, Jingbo Shang. Large Language Models for Time Series: A Survey. *Under Submission*. [\[Link\]](#)
- Ranak Roy Chowdhury**, R. Kapila, A. Panse, X. Zhang, D. Teng, R. Kulkarni, D. Hong, R. Gupta, J. Shang. ZeroHAR: Contextual Knowledge Augments Zero-Shot Wearable Human Activity Recognition. *Under Submission*.
- H. Guo, R. Hosseini, R. Zhang, SA Somayajula, **Ranak Roy Chowdhury**, R. Gupta, P. Xie. MLO-MAE: Downstream Task Guided Masking Learning in Masked Autoencoders Using Multi-Level Optimization. *Under Submission*. [\[Link\]](#)
- Xiyuan Zhang, **Ranak Roy Chowdhury**, Dezhi Hong, Rajesh K. Gupta, Jingbo Shang. SHARE: Unleashing the Power of Shared Label Structures for Human Activity Recognition. **CIKM 2023**. [\[Link\]](#)
- Ranak Roy Chowdhury**, Jiacheng Li, Xiyuan Zhang, Dezhi Hong, Jingbo Shang, Rajesh K. Gupta. PrimeNet: Pre-training for Irregular Multivariate Time-Series. **AAAI 2023**. [\[Link\]](#)
- X. Zhang, X. Fu, D. Teng, C. Dong, K. Vijayakumar, J. Zhang, **Ranak Roy Chowdhury**, J. Han, D. Hong, R. Kulkarni, J. Shang, R. Gupta. PILOT: Physics-Informed Data Denoising for Real-Life Sensing Systems. **SensSys 2023**. [\[Link\]](#)
- Xiyuan Zhang, **Ranak Roy Chowdhury**, Jingbo Shang, Rajesh K. Gupta, Dezhi Hong. STAug: Towards Diverse and Coherent Augmentation for Time-Series Forecasting. **ICASSP 2023**. [\[Link\]](#)
- Ranak Roy Chowdhury**, Xiyuan Zhang, Jingbo Shang, Rajesh K. Gupta, Dezhi Hong. TARNet: Task-Aware Reconstruction for Time-Series Transformer. **KDD 2022**. [\[Link\]](#)
- Xiyuan Zhang, **Ranak Roy Chowdhury**, Dezhi Hong, Jingbo Shang, Rajesh K. Gupta. ESC-GAN: Extending Spatial Coverage of Physical Sensors. **WSDM 2022**. [\[Link\]](#)
- Shuheng Li, **Ranak Roy Chowdhury**, Jingbo Shang, Rajesh K. Gupta, Dezhi Hong. UniTS: Short-Time Fourier Inspired Neural Networks for Sensory Time Series Classification. **SensSys 2021**. [\[Link\]](#)
- Ranak Roy Chowdhury**, Muhammad Abdullah Adnan, Rajesh K. Gupta. Real Time Principal Component Analysis. **TDS 2020** [\[Link\]](#), **ICDE 2019**. [\[Link\]](#)

HONORS and AWARDS

- Invited keynote speaker at SIGKDD 2023 Workshop on Machine Learning in Finance. [\[Link\]](#)
- Qualcomm Innovation Fellowship 2022. One of the 19 winners among 132 participants across North America. [\[Link\]](#)
- Halicioglu Data Science Institute Graduate Fellowship 2019. One of the 10 winners among 3906 applicants. [\[Link\]](#)

SOFTWARE PROFICIENCIES

Python, Linux, Git, PyTorch, Keras, Tensorflow, fairseq, Hugging Face, NumPy, pandas, SciPy, Matplotlib, Seaborn, scikit-learn, statsmodels, Pillow, OpenCV, NLTK, CoreNLP, Gensim, spaCy, C, C++, Java, Matlab, SQL, PostgreSQL