

# Ranak Roy Chowdhury

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

## SUMMARY

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

## WORK EXPERIENCE

- |   |   |                            |
|---|---|----------------------------|
| <b>Amazon Web Services, Inc.</b>  | <b>Applied Scientist II Intern</b>          | <b>Jun 2023 – Sep 2023</b> |
| <ul style="list-style-type: none"><li>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. <a href="#">[Link]</a></li></ul>                  |   |                            |
| <b>Qualcomm, Inc</b>  | <b>Research Fellow</b>                      | <b>Oct 2022 – Sep 2023</b> |
| <ul style="list-style-type: none"><li>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. <a href="#">[Link]</a></li></ul>                             |   |                            |
| <b>Amazon Web Services, Inc.</b>  | <b>Applied Scientist II Intern</b>          | <b>Jun 2022 – Sep 2022</b> |
| <ul style="list-style-type: none"><li>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. <a href="#">[Link]</a></li></ul>           |   |                            |
| <b>Nokia Bell Labs</b>  | <b>Data Science Intern</b>                  | <b>Jun 2021 – Aug 2021</b> |
| <ul style="list-style-type: none"><li>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. <a href="#">[Link]</a></li></ul> |   |                            |
| <b>Amazon Web Services, Inc.</b>  | <b>Software Development Engineer Intern</b> | <b>Jun 2020 – Sep 2020</b> |
| <ul style="list-style-type: none"><li>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%. <a href="#">[Link]</a></li></ul>                         |   |                            |

## EDUCATION

- |   |                                       |
|---|---------------------------------------|
| <b>PhD in CS - University of California San Diego</b>   | <b>Sep 2019 – Jun 2024 (Expected)</b> |
| <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 |                                       |
| <b>MS in CS - University of California San Diego</b>  | <b>Sep 2019 – Jun 2022</b>            |
| <b>BSc in CSE - Bangladesh University of Engineering and Technology</b>                                     | <b>Jul 2014 – Oct 2018</b>            |

## SELECTED PUBLICATIONS

- Xiyuan Zhang, **Ranak Roy Chowdhury**, Rajesh K. Gupta, Jingbo Shang. Large Language Models for Time Series: A Survey. *IJCAI* 2024. [\[Link\]](#)
- 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. *SenSys* 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. *SenSys* 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