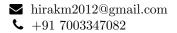
# HIRAK MONDAL

Senior Engineer, Samsung Research Institute Bangalore M.Tech (CSE), IIT Kanpur



# Work Experience

## Senior Engineer(Speech AI), Samsung Research Institute Bangalore

(Aug'22-present)

- Galaxy AI team: ML model development of On-Device ASR models for S23 and S24 flagship devices.
- Achieving an overall improvement of approx. 20% on Most Widely Use Cases (MWUC) utterances.
- Speech to Speech research and commercialization activities involving model training and improvement.
- Named Entity Recognition and Correction for present ASR models achieving 8% NER improvements.

## **Academic Qualifications**

Year	Degree/Certificate	Institute	CPI/%
2022	M.Tech. (CSE)	Indian Institute of Technology, Kanpur	8.28/10
2020	B.Tech. (CSE)	University of Engineering and Management, Kolkata	9.17/10
2016	HSE West Bengal State Board	Patha-Bhavan, Kolkata	83.40%
2014	SE West Bengal State Board	Patha-Bhavan, Kolkata	88.40%

## **Projects**

#### • Multilingual NMT featuring Llama with LoRA

- Designed and implemented state-of-the-art multilingual neural machine translation models using the **LLaMA** framework along with **LoRA**, enabling high-quality translation across multiple languages.
- Integrated diverse multilingual datasets into LLaMA models to enhance language coverage and translation robustness for less-resourced languages.
- Language supported presently : Hindi  $\rightarrow$ English and Bengali  $\rightarrow$ English.
- Future plan involve conversion of Language X to Language Y, instead of Language X to only English.
- Check out this cool work at HuggingFace

## • Named Entity Correction using G2P Techniques

- Created and optimized algorithms for correcting named entities in text using advanced grapheme-to-phoneme (G2P) conversion techniques.
- Designed and implemented G2P conversion models to accurately translate written forms of named entities into phonetic representations, improving recognition and correction accuracy.
- Integrated G2P conversion processes into named entity recognition (NER) systems, leading to 8% increase in the accuracy of entity identification and correction.
- Conducted extensive testing and refinement of phoneme mapping algorithms to enhance the precision of named entity correction in diverse linguistic contexts.

#### • Speech-to-Speech Translation using Fairseq

- Designed and built advanced models for real-time speech-to-speech translation using Fairseq framework.
- Managed the collection and annotation of large-scale multilingual speech datasets to train and refine translation models.
- Worked closely with software engineers, data scientists, and linguists to develop and deploy speech-to-speech translation solutions.

#### **Publication**

#### "Revisiting UAV Authentication Schemes: Practical Attacks on Aviation Infrastructure", AsianHOST, Dec 2021

- Co-authored by Dr. Urbi Chatterjee, Assistant Professor, Dept of CSE, IIT Kanpur
- Detected vulnerabilities in existing authentication mechanism for UAVs
- Explored PUF based security solutions to mitigate the same

#### Technical Skills

- Languages: C++, Python; Familiarity with- MySQL, Java
- Tools & Frameworks: Tensorflow, PyTorch, Hugging Face, SciKit Learn, Pandas
- Operating System: Linux

## Awards & Scholastic Achievements

- Secured AIR 111 in JEST 2020 Theoretical Computer Science Examination
- Samsung Excellence Award for commercialisation of S24 enGB model.

(Feb'20)

(Dec'23)