HIRAK MONDAL

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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**
  - Designed and implemented state-of-the-art multilingual neural machine translation models using the LLaMA framework, 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 →English and Bengali →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 (*Feb'20*)
- Samsung Excellence Award for commercialisation of S24 enGB model. (*Dec'23*)