Arkaprava Biswas

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Education

Year	Degree/Certificate	Institute	CPI/%
2021-Present	M.S.R./EE (spec. SPCOM)	Indian Institute of Technology, Kanpur	8.5 / 10
2016-2020	B.Tech./ECE	Kalyani Government Engineering College, WB	7.7 / 10
2014-2016	Senior Secondary(XII)	Baranagore Narendranath Vidyamandir, WB	89.6 %
2012-2013	Secondary(X)	Baranagore Ramakrishna Mission, WB	87.4 %

Technical Skills

Languages: Python, MATLAB, C, Assembly
Skills: Machine Learning, Deep Learning, Audio/Digital Signal Processing, Computer Architecture, Embedded Systems, Linux Kernel, Computer Arithmatic, Documentation
Libraries/Tools: Tensorflow, PyTorch, Sklearn, NumPy, Embedded Software Programming(RISC-V, ARM CORTEX A/M), Software Development Tools.

Internship Experience

- **DSP Engineer** (Full-time Internship) [Vinjey Software Systems Pvt. Ltd.] (*Jan 2024 - Ongoing*)
  - ▹ Working on development and optimization and porting of Audio Codecs for specific hardware architectures.
  - ▹ Developing performance optimized library of audio codecs.
- **Senior Student Research Associate:** (DORD-IITK) [Principal Investigator: Dr. Vipul Arora] (*Nov 2022 - Dec 2023*)
  - ▹ Developed theory to reduce the annotation cost of both non-overlapping (multi-class) and overlapping (multi-label) sound event detection (SED) using synthetic audio by addressing distribution gap between synthetic and real audio.
  - ▹ Conducted experiments to evaluate algorithm effectiveness and compared performance against several baseline methods (e.g., Fully Supervised, Mean Teacher, Domain Discriminator, Maximum Classifier Discrepancy, Unsupervised Data Augmentation)[Under review at Signal Processing Letters].
  - ▹ Applied the algorithm on custom dataset to deploy model by reducing annotation cost.
- **Research Engineer(ML/AI):** (Part-time Internship) [GenVR Research Private Limited] (*May 2023 - July 2023*)
  Led the team to:
  - ▹ Develop an Automatic Voice Conversion and Text-To-Speech system for English Language and Indian Languages (Hindi, Tamil)using a TTS pipeline based on Bark and VC pipeline based on QuickVC model.
  - ▹ Developed a pipeline where TTS was based on Bark and VC was based on QuickVC model.

Publications

- **Unsupervised Domain Adaptation For Sound Event Detection in Music Applications** , ISMIR 2022 Late-Breaking-Demo

Key Projects

- **Image Style Transfer Using Cycle GAN** (Personal Study/Projects) (*Nov 2023*)
  - ▹ Done Bi-directional Style transfer on Vangogh2photo dataset.
  - ▹ Used a resnet-type generator and trained using Cycle GAN and evaluated performance using FID and LPIPS score.
- **Most Relevant articles of a given WikiPedia article** (Personal Study/Projects) (*Feb 2022*)
  - ▹ Utilized Beautiful Soup to parse Wikipedia articles.
  - ▹ Employed regular expressions to extract clean data from noisy XML files.
  - ▹ Developed a K-Nearest-Neighbor algorithm from scratch for the task.
- **Localize Music and Speech in a given audio stream and tag the audio** (EE603A), [Instructor: Dr. Vipul Arora] (*Oct 2021 - Nov 2021*)
  - ▹ Provided with validation data, so we had to create our own training dataset.
  - ▹ Prepared the training dataset by processing audio after downloading from YouTube.
  - ▹ Trained an LSTM model using a multi-task approach, which allowed us to jointly detect classes and tag the audio.
- **Audio Steganography for text messages** (B.Tech. Final Year Project), [Advisor: Dr. Angsuman Sarkar] (*Jan 2020 - May 2020*)
  - ▹ Written encryption and decryption modules.
  - ▹ Modified particular bits of DWT coefficients of audio with text message bits.
  - ▹ Selected particular bit using energy-based thresholding.

Positions of Responsibility

Teaching Assistant: (EE603A) Machine Learning for Signal Processing (*Jul 2022 - Nov 2022*)
Teaching Assistant: (EE301) Digital Signal Processing (*May 2021 - Jul 2021*)

Relevant Courseworks

Machine Learning for Signal Processing, Advanced Topics in Machine Learning, Data Structure and Algorithms for Electrical Engineers, Machine Learning for Wireless Communication, Detection and Estimation Theory(Statistical Signal Processing).