

# Hemantha Krishna Bharadwaj

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## Education

### Georgia Institute of Technology

MS Electrical and Computer Engineering, DSP-ML Specialization

Teaching Assistant, OMSCS Machine Learning, GPA: 3.83/4.0

Atlanta, GA

Aug 2022 – May 2024

### Birla Institute of Technology and Science [BITS] Pilani

B. Eng. Electrical and Electronics, GPA: 9.3/10.0

India

Aug 2018 – May 2022

**Relevant Coursework:** Statistical ML, Data Structures, Algorithms, Advanced Programming, Digital Signal Processing

**Programming Languages:** C, C++, Python / **Relevant Software:** Tensorflow, Git, Langchain, OpenAI API, MATLAB

## Experience

Upcoming Machine Learning Data Scientist at RippleWorx

### Airlinq

Jul 2023 – Jan 2024

Generative AI Technical Lead

- Led a cross-functional team of 15 and oversaw the end-to-end process, from concept to deployment, of an AI system that allows vehicle owners to engage in personalized conversations with their cars
- Leveraged large language models (LLMs) in conjunction with retrieval augmented generation and autonomous task generation for creating tailored experiences for car owners, vehicle manufacturers, and service engineers
- Designed and implemented a system comprising vector databases, LLM chains, autonomous agents, and memory
- Demonstrated proficiency in a diverse range of tools and frameworks: Langchain, LLMs (OpenAI, Llama2, Falcon), speech transcription (Whisper AI), HuggingFace integration, embedding models

### Machine Learning for Speech – Georgia Tech

Aug 2022 - Dec 2022

Course Project

**Project:** Analysis of SSL Models for Speaker Identification

- Improved on self-supervised speaker-ID models (Hubert & Wav2Vec2) by using an embedding ensemble approach
- Explored the necessity of attention masks and zero-padding and studied changes in performance in their absence
- Optimized input audio length and achieved 97.31% accuracy, outperforming Hubert on the VoxCeleb dataset

### Digital Audio Processing Lab, IIT Bombay

Feb 2022 - April 2022

Machine Learning Intern

**Project:** Multi-modal audio-visual Raga and Singer Classification using CNNs

- Developed 3 2D convolutional network architectures for Raga (melodic mode) identification
- Experimented with 6 spectrogram inputs with 2D CNN for the classification task for multimodal classification

### SPIRE Lab, Indian Institute of Science

Aug 2021 – Feb 2022

Machine Learning Intern (Thesis in collaboration with Bill and Melinda Gates Foundation)

**Project:** Speech Recognition in Agriculture, Finance for the Indian Poor

- Developed a domain-specific web scraping pipeline in Python to create NLP training text corpora in 9 local Indian languages that increased scraping efficiency by 40%
- Analyzed collected text corpora to design and train domain-specific NLP language models for use in speech recognition and speech-to-text systems
- Developed speech recognition models in local Indian languages for use in educationally backward rural areas

### University of Calgary

May 2021 – Aug 2021

Machine Learning Intern

**Project:** Identification and Cancellation of Fauna Noise using AI

- Developed an audio processing model using deep neural networks for identification and cancellation of environmental fauna noise from professional audio recordings
- Preprocessed audio recordings into mel spectrograms for a 4-layer neural network identifying possible noise frequencies for subsequent removal from the original audio signals

### BITS IoT Lab

Jul 2020 – Feb 2021

Machine Learning Intern

**Project:** Machine Learning in Healthcare-IoT

- Documented the role of 16 ML algorithms in the development of 100+ state-of-the-art Healthcare-IoT systems
- Compared applications of machine learning in the domains of diagnosis, prognosis and spread control, assistive systems, monitoring, and logistics on the basis of accuracy and practical usability

## Publications and Conferences

1. H. K. Bharadwaj et al., "A Review on the Role of Machine Learning in Enabling IoT Based Healthcare Applications," in IEEE Access, vol. 9 [\[Link\]](#) [\[100+ citations\]](#)
2. Volunteer - International Society for Music Information Retrieval (ISMIR) Conference 2021

## Academic Achievements

### Mitacs Globalink Research Scholarship

2021

- Awarded a full scholarship to pursue a summer internship at the University of Calgary, Canada

### O.P. Jindal Engineering and Management Scholarship

2019

- 1 of 80 engineering students from among the best academic performers in the top 23 Engg institutes in India

### BITS Merit Scholarship

2018-19

- Awarded the BITS Merit Scholarship for being in the top 3% academic performers in the batch