Parthasarthi Aggarwal

in-Parthasarthi

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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech.	Electronics Engineering, Indian Institute of Technology (BHU) Varanasi	9.54/10	2024
Minors	Humanistic Studies, Indian Institute of Technology (BHU) Varanasi	9.75/10	2024
12th Grade	CBSE Board	92.8%	2020
10th Grade	CBSE Board	94.7%	2018

Skills and Interests

- **Fields of Research:** Embedded Systems, Machine Learning, Federated Learning, Circuit Design, Edge Computing, Internet of Things (IoT), Wireless Networks
- **Programming Languages:** C/C++, C#, Verilog, Python, Java, Matlab, 8085 Assembly Language
- **Technical Skills:** Embedded System Design, Circuit Design (Analog/Digital), PCB Design, Wireless Network and Communication Protocols, Microcontroller Programming

Research Papers

1. Atharva Bhatt*, **Parthasarthi Aggarwal***, and Oppili Prasad L., "Remote Monitoring and Detection of Amyotrophic Lateral Sclerosis Disease Through Wireless EMG Measurement System," *2024 IEEE 6th Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability (ECBIOS)*, Tainan, Taiwan, 2024, pp. 205–210. *Authors with equal contribution. doi: 10.1109/ECBIOS61468.2024.10885522.

Experience

- **Oracle India Pvt. Ltd. - Member of Technical Staff - 1** Jun 2024 - Present
  Oracle HTTP Server, Fusion middleware
  - Optimizing server architecture and routing protocols (C, C++) for Oracle HTTP Server (OHS) to enhance performance and network efficiency.
  - Working on secure communication protocols, focusing on SSL encryption and HTTP/2, for efficient data transmission.
  - Implementing enhancements in routing protocols and security measures at Transmission(TCP) and Application layers to mitigate DDOS attacks.
- **Indian Institute of Technology (BHU) Varanasi - Research Intern** Jan 2024 - May 2024
  Ubiquitous Computing Lab, Department of Computer Science & Engineering *Dr. Hari Prabhat Gupta*
  - Worked on BLE technology and custom routing protocol development. Experimentation with edge computing and Tiny ML.
  - Development of a smart environmental monitoring system for campus wide deployment. Designed the integration of numerous sensors, LoRa technology for real-time data collection and analysis.
- **Oracle India Pvt. Ltd. - Server Tech Intern** May 2023 - Jul 2023
  Corporate Architecture
  - Developed JavaScript code and REST APIs for self-contained applications within a modular framework, delivering flexible, customized solutions.
  - Ensured compliance with WCAG standards and industry norms for accessibility and responsiveness
- **Expand My Business - Tech Intern** Nov 2021 - Jan 2022
  Backend Web Development
  - Enhanced application functionality through middleware optimization; streamlined vendor management with a comprehensive webpage and resolved key routing issues.

Projects

- **Real-Time Monitoring and Detection of Neuromuscular Diseases**
  UG Project under Dr. Oppili Prasad L *Jan 2023 - May 2024*
  - Device development for detecting raw **Electromyography (EMG)** signals via microcontroller; utilized Digital Signal Processing and Machine Learning for disease detection, fabrication on a **PCB** report.
  - Achieved **92.6%** precision in classifying EMG signals using a 1-D CNN on a remote server.
  - Maintained device cost under **INR 500**, significantly lower than one-time EMG tests (INR 5000-14000).
  - Paper presented at the **2024 IEEE 6th Eurasia Conference on Biomedical Engineering, Healthcare and Sustainability** and won **The Best Paper Award**.
- **Framework for Sensor Node Fault Diagnosis in Ag-IoT Using Federated Learning**
  Research Project under Dr. Om Jee Pandey *Aug 2023 - Jun 2024*
  - Analyzed conventional sensor fault diagnosis methods, identified shortcomings in detecting sparse faults, and developed a novel framework using federated learning and edge computing for fault detection.
  - Proposed two novel federated learning algorithms and compared their performance against existing methods based on accuracy, training time, and computing cost.
  - Implemented an ensemble classifier at the central server for effective fault classification.
- **Human Activity Recognition Project**
  CSO-332(Ubiquitous Computing)
  - Developed a Human Activity Recognition project using LSTM and CNN architectures to analyze gyroscope, accelerometer, and magnetometer data from diverse activities, with a curated dataset collected from specific stylus movements on a board.
  - Employed LSTM for sequential movement analysis and CNN for spatial feature extraction.
- **Medical Diagnosis using Genetic Algorithm and Neural Networks**
  CSE-458(Soft Computing)
  - Applied a genetic algorithm (population size 20, crossover 0.4, mutation 0.055) on a dataset of 1,098 Gastrointestinal Bleeding WCE images, utilizing pre-trained CNN models (DenseNet, ResNet, InceptionV3) for feature extraction, resulting in 5,120 features.
  - Initial individual CNN models achieved accuracies of **74%-76%**, which improved to approximately **88%-90%** after data augmentation. The combined model of *ResNet, DenseNet, and InceptionV3* achieved the highest accuracy of **92%**, demonstrating the effectiveness of the combined approach. Link

Relevant Academic Courses

CSO-101(Computer Programming), **EO-203**(Digital Circuits and Systems), **CSO-332**(Ubiquitous Computing), **EC-323**(Embedded System Design), **EC-311**(Digital Communication), **EC-321**(Microprocessor Engineering), **EC-431**(Basic VLSI Design), **EC-331**(Microelectronics), **ME-314**(Mechatronics), **EC-423**(Internet of Things)

Achievements

- Cleared Pre-Regional Mathematical Olympiad and Regional Mathematical Olympiad and Qualified for Indian National Mathematical Olympiad, 2020
- **S**ecured All India Rank of 2272 out of 1 million aspirants in JEE 2020.
- **Runner-up** in the inter-college 'Mosaic' Deep Learning competition at UDYAM'22, IIT(BHU).
- **3rd place** in the Data Science competition 'Cassandra' at UDYAM'22, IIT(BHU).

Volunteering & Extracurriculars

- **Operations Executive** of **E-Summit'22**: managed workshops & events aimed at fostering Entrepreneurial culture.
- **Manager** at **Entrepreneurship-Cell, IIT (BHU) Varanasi** that assisted over 100 student startups.
- **Student Mentor**: provided mentoring and resources to a cohort of 40 students.
- **Runner-up**, 'Are We Alone' technical essay writing competition, Celesta Inter-IIT, 2020.
- **Co-Author**, *Startup HelpBook Part-1 and Part-2* at Entrepreneurship-Cell, IIT BHU.
- **Data Operations Executive** at **Ambitio Technologies Pvt. Ltd.**: conducted competitive analysis.