Nagasurya Randhi

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EDUCATION & SKILLS

Indian Institute of Engineering Science and Technology, Shibpur — Kolkata, India
B.Tech in Information Technology - CGPA : 8.98 — 2021 - 2025

- **Relevant Coursework:** Machine Learning, Artificial Intelligence, Data Structures & Algorithms, Operating Systems, DBMS, OOPS, Computer Networks, Discrete Math & Probability, Linear Algebra & Differential Equations, Computer Architecture [*Graduate Level*]
- **Technical Skills:** Python, C/C++, SQL, Git, Linux, PostgreSQL, Docker, TensorFlow, PyTorch, HuggingFace, Flower, Continual Learning, Federated Learning.

EXPERIENCE

Technical Analyst - Deloitte — Bengaluru, Karnataka
Technology and Transformation Analyst For Economic Development and Urban Transformation. — Jul 2025 - Present

Research Associate - DRDO(DYSL-AI) & IIIT Delhi — Remote
Continual Learning Researcher — Dec 2024 - Jun 2025

- Developed C-FLAG, a federated continual learning framework integrating AGEM and memory-based gradients, evaluated on Split CIFAR-10/100 and TinyImageNet with high accuracy and low forgetting.
- Adapted OpenAI Whisper-Tiny into a privacy-preserving federated ASR system by decoupling the encoder and training a decoder for multilingual speech recognition on edge devices.

Research Intern — NITK Surathkal, Karnataka
Federated Learning Researcher (under Prof. Annappa) — Mar 2024 – Dec 2024

- Designed federated multi-horizon forecasting models to predict CPU utilization of Microsoft Azure VMs in edge data centers with 51% lower MSE than centralized baselines.
- Leveraged AzurePublicDatasetV2 (~2.6M VMs, 1.9B readings) to integrate Kalman filtering and attention-based GRUs, boosting prediction accuracy for CPU and memory workloads.

PROJECTS

FedMV: Multivariate Edge Workload Forecasting using Federated Learning
Federated Learning, GRU + Multi-Head Attention + Kalman Filter — Mar 2024 - Dec 2024

- Engineered a Federated multi-horizon forecasting framework using GRUs, multi-head attention, and Kalman filtering to predict Edge CPU workloads while ensuring zero raw-data transfer, boosting privacy compliance in distributed cloud environments.
- Simulated non-IID heterogeneous workloads across 10 federated clients via Dirichlet-based data distribution, achieving MSE = 0.00492, MAE = 0.0562 for 60-min forecasts, outperforming centralized models by 51% in MSE validating model robustness for real-world edge computing scenarios.
- Implemented on the Flower FL framework, showcasing a robust, production-ready architecture that scales to multi-client environments while outperforming centralized baselines in both accuracy and privacy preservation.

Continual Federated Learning with Aggregated Gradients (C-FLAG) — Research Project
Continual Learning – Under Prof. Ranjitha Prasad (IIIT Delhi) — Dec 2024 – Jun 2025

- Developed C-FLAG, a novel replay-memory based federated strategy consisting of edge-based gradient updates on memory and aggregated gradients on current data, addressing the catastrophic forgetting issue.
- Integrated AGEM into federated learning setups across datasets like Split-CIFAR10, Split-CIFAR100, and TinyImageNet.
- Evaluated performance using Average Accuracy (Acc) for overall model performance and Forgetting (Fgt) for knowledge retention, achieving: CIFAR10 (94.72% Acc, 2.26% Fgt), CIFAR100 (67.05% Acc, 8.10% Fgt), and TinyImageNet (44.3% Acc, 7.65% Fgt).

Visual Question Answering
Computer Vision Research Project under Dr. Arindam Biswas — Aug 2023 - Mar 2024

- Visual Question Answering using Stacked Attention Networks - Goal is to use the image to generate the correct answer to the question asked, by using a CNN and an LSTM.
- Implemented a 2-channel vision + language model, fusing embeddings via point-wise multiplication, and generating a probability distribution over possible answers. Enhancing this with a stacked attention layer, our advanced deep learning approach achieved 54.82% accuracy. The model's top-5 predictions were visually and logically sound. Stacked attention layers improved multi-step reasoning and focused on relevant image portions for accurate answers.
- Stacked Attention Network Accuracy's are as follows : All Questions 54.82%, Yes/No Questions 80.50%, Numbers 33.45% .

AWARDS & LEADERSHIP

College Basketball Team Captain – Led the team in inter-college tournaments, fostering teamwork and strategy.

Core Member, CodeIIEST-ML Chapter – Mentored ML projects for **CodeIIEST Summer Of Code (CSOC)**.

Top 10 in Department – Recognized for academic excellence.