ANANDHARAJU DURAI RAJU

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SUMMARY

An innovative, highly adaptable and impact-driven applied AI Researcher and Engineer solving real-world problems with deeper knowledge in classic (CNN, Recurrent) and advanced (multi-modal LLM, xLSTM) deep learning and their optimization, with 7+ years of professional experience as a backend lead in Retail and Telecom domains.

SKILLS

- **Languages:** Python, Apache Spark, Java, Springboot, C++
- **ML/DL Frameworks/Libraries:** PyTorch, Tensorflow, Keras, HuggingFace, Unsloth AI
- **Parallel Computing:** Distributed Data Parallel, Python multiprocessing, Pandas Dask, MPI (C++), HF Accelerate
- **Databases:** Postgres, HBase, Oracle, DB2
- **Tools/Packages:** Docker, Ollama, vLLM, SGLang, Jinja, NLTK, SpaCy, Postman, Kafka, Grafana, REST, Git, JIRA
- **AI Agent Frameworks:** SmolAgents, LangChain, LangGraph, LlamaIndex, Azure AI, AWS Bedrock

RESEARCH EXPERIENCE

Research Assistant, Simon Fraser University | **Canada** | Prof. Ke Wang ***Jan 2019 – Present***

- Surpassed benchmark performance in Table semantics understanding by 4% (F1-score) via LLM-guided Graph Attention Networks (*Current Work*)
- Accelerating LLM inference over long sequences via optimized attention blocks (*Current Work*)
- Trained Transformers and xLSTMS on long sequences with 96x less GPU memory using CNN extractors
- Reduced GPU memory (22x), time (50%), and carbon footprint (7x) **without performance loss** in training malware classification CNNs on ultra-long sequences (>250M timesteps), achieved via a **novel retroactive pruning** and *custom backpropagation* ***– Published in ACM CIKM 2024*** [*PDF*]
- Surpassed state-of-the-art performance by 2-9% TPR @ 0.1% FPR using a **novel boosting** method designed for efficiently learning sequential representations with minimal false detections ***– Published in IJCNN 2022*** [*PDF*]
- Expertise in optimizing LLM/DL GPU usage via gradient checkpointing, offloading, quantization and LoRA/QLoRA

ACADEMIC PROJECTS

- Ranked 1st on MovieQA task by improving BERT via semantic sentence similarity-based **input pruning**
- Built and **pre-trained** (GPT, Llama) from scratch, fine-tuned multi-modal LLM for speech/visual QA
- Fine-tuned TimeGPT reducing error in multi **time-series** electricity demand **forecasting** by 5x than LGBM
- Trained credit card **fraud detection** models (XGBoost, LightGBM, Variational AutoEncoder) with 97.6% accuracy

INTERNSHIP EXPERIENCE

Research Intern, Huawei Canada | **Canada** | **Data Privacy & Protection Tech. Lab** ***Jan 2021 – Dec 2021***

- Delivered an **end-to-end** CNN-based malware detector as a Docker release with 10-100ms detection latency
- Developed a compact top-performing residual neural network-inspired FNN with 97% malware detection accuracy
- Successfully published a **pioneering survey paper** on cross-architectural IoT malware threat hunting [*PDF*]
- Prototyped distillation models for learning assembly (opcode) sequences with Dask-based parallel processing that reduced pre-processing time by 80%

PROFESSIONAL EXPERIENCE

Technology Lead, Infosys Limited | **India** | **AI & Automation Services** ***Sep 2011 – Dec 2018***

- Led and mentored a team of 14 (Onsite + Offshore) as Feature Team Lead for a bigdata project
- Driven agile-based software development for UI, API and Spark modules to process real-time order event data
- Won client's **"AWARD OF EXCELLENCE"** in 2016 and 2017 for tackling high priority incidents and change requests
- Reduced 47 hours/month of manual work to monitor InfoVista servers by developing SSH/JSch-based automation
- Trained in Azure AI and IBM Watson where I built OCR pipeline using Tesseract/Azure OCR on scanned documents
- Experienced in client discussions and gathering requirements to effectively address the business problems

AWARDS AND MISCELLANEOUS ROLES

- Garnered **"GOLD MEDAL" (Top 1%)** at state level in my undergraduate studies from Anna University
- Played the role of **"STUDENT CHAIRMAN"** of Computer Science department for undergraduates
- Reviewer in Conferences and Journals – KDD, ICDM, ICDE, WSDM, IEEE Access, Journal of Cyber Security