ANANDHARAJU DURAI RAJU

Ph.D. Candidate, Computing Science, Simon Fraser University, Burnaby
+1 (604) 518-3116 Vancouver, Canada anandharaju@ieee.org
linkedin.com/in/anandharaju
anandharaju.github.io
Google Scholar

SUMMARY

An organized, highly adaptable and impact-driven applied AI enthusiast with deeper knowledge in classic (CNN, Recurrent, NLP) and advanced (multi-modal LLM, xLSTM) deep learning and their optimization, with 7+ years of previous experience in backend development in Retail and Telecom domains. Skilled in pretraining foundation models from scratch (SLM), supervised finetuning, PEFT (LoRA, quantization, prompt tuning) and robust evaluation of LLMs

KEY PUBLICATIONS (as First Author)

- Low Carbon Footprint Training for 1D-CNNs with Temporal Max-Pooling, *ACM CIKM 2024* (*Activation pruning*)
- LockBoost: Detecting Malware Binaries by Locking False Alarms, *IJCNN 2022* (*Boosting method for sequential data*)
- A survey on cross-architectural IoT malware threat hunting, *IEEE Access 2021*

SKILLS

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

RESEARCH EXPERIENCE

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

- Worked on optimizing embedding space of GPT, Llama for pretraining on FineWeb and fine-tuning on medical data
- Ideated and implemented a **novel pruning-based optimization** for training malware classification CNNs over extremely large sequence data (>250 million timesteps) with 22x less GPU memory, 50% less training time and 7x less carbon footprint than existing memory-efficient approaches, **without sacrificing** model performance
- This GPU efficiency stems from a retroactive **activation pruning**-based forward propagation and a simplified **custom backpropagation** integrated with a partitioned data loading strategy
- Ideated and developed a **novel boosting** method, for locking false positives and boosting true positives predictions when learning sequential representations, that surpassed state-of-the-art performance by 2-9% TPR @ 0.1% FPR
- Developed **low-GPU hybrid** models with CNN as feature extractor and Transformers / BiLSTM / xLSTM as learners
- Expertise in gradient checkpointing, offloading and model compression to optimize training GPU usage
- Topped leaderboard on MovieQA task by improving BERT via semantic sentence similarity-based **input pruning**

INTERNSHIP EXPERIENCE

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

- Delivered an **end-to-end** CNN-based tiered malware detector system as a Docker release
- Developed a compact top-performing residual neural network-inspired FNN with 97% malware detection accuracy
- Prototyped knowledge distillation models for learning assembly/opcode data with Dask-based parallel pre-processing
- Provided regular team-wide presentations on my literature review findings, gaps and potential novel research ideas
- Successfully published a **pioneering survey paper** on cross-architectural IoT malware threat hunting

PROFESSIONAL EXPERIENCE

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

- Feature Team Lead (Onsite + Offshore) for a team of 14 resources for data provisioning and order visibility project
- Driven agile-based software development for UI, API and Spark modules to process real-time event data
- Won client's **"AWARD OF EXCELLENCE"** in 2015 and 2016 for tackling high priority incidents and change requests
- Initiated automations with business value such as developing SSH and JSch-based tool to monitor the status of InfoVista components deployed in hundreds of servers, reducing 47 person-hours/month of manual work

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
- Graduate/Undergraduate Teaching Assistant at SFU for Data Mining, Database Systems and C Programming courses
- Reviewer in Conferences and Journals – KDD, ICDM, ICDE, WSDM, IEEE Access, Journal of Cyber Security