D K Bhargav Achary

System Engineer · Master of Science · CSE, IIT Hyderabad

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Summary

- "System Engineer" with an MS in Computer Science & Engineering with diverse experiences across academic research, high-performance computing in the defense sector, and the semiconductor industry. Expert in performance analysis, microarchitecture debugging, and system optimization.
- Adept at benchmarking and validating complex hardware systems, with a strong track record in resolving RTL and simulator-level miscorrelations. Proficient in C/C++, Python, deep learning, and computer architecture, with published work on hardware side-channel attacks and DNN security.
- Open to visa sponsorship and relocation opportunities, preferably in the Netherlands, Ireland, or other EU regions.

Experience

IBM India Private Limited, Bangalore Hardware Developer - Power Systems Performance Team   *Oct 2024 - till date*
- Executing the PMU validation in the IBM Power Processor fabric, ensuring accurate performance measurement and profiling.
- Streamlined tool adoption and development workflows by ramping up multiple inhouse hardware development environments within IBM, accelerating project onboarding and efficiency.

AMD India Private Limited, Bangalore Senior Silicon Design Engineer - Ryzen Core Performance Modeling Team   *Dec 2023 - Jun 2024*
- Collaborated with CPU core performance modeling team to enhance flow automations and PMC data postprocessing.
- Executed studies on micro-architectural changes in the performance model, debugged simulator-RTL correlation issues.

Qualcomm India Private Limited, Bangalore Hardware Engineer - Hexagon DSP Performance Team   *Nov 2021 - Dec 2023*
- Collaborated in the pre-silicon performance verification of Hexagon DSP cores to meet design specifications and project deadlines.
- Independently drove the performance verification for over three DSP cores, delivering comprehensive results ahead of schedule.
- Coded directed tests for feature evaluation on caches, yielding enhanced insights into system performance expectations.

Indian Institute of Technology, Hyderabad Graduate Researcher / Teaching Assistant   *Dec 2018 - June 2021*
- Awarded a Research Scholar position funded by the Ministry of Education (MHRD) to pursue advanced studies in CSE.
- Completed 11 research focused courses, including Deep Learning, Secure Memory Systems, and Advanced Computer Architecture.
- Served as a Teaching Assistant for multiple CSE courses, supporting instruction and providing mentorship to students.
- Conducted research on DNN hardware attacks and performance counters, leading to a peer-reviewed ACM publication.
- Exited integrated PhD track due to COVID-19 disruptions and family medical circumstances.

DRDO (Ministry of Defence), Hyderabad Senior Technical Assistant - B   *Jul 2016 - Jan 2018*
- Provided technical & computational support for experimental design & execution, collaborating with HPC & Resources teams.
- Researched quantum computing through a comprehensive literature review & exploration of 2-qubit system on IBM Quantum.
- Maintained optimal workstation performance as a system admin, helped deploying a private cloud with OpenStack.

Indian Institute of Technology, Guwahati Graduate Researcher / Teaching Assistant   *Jul 2015 - May 2016*
- Awarded a Research Scholar position funded by the Ministry of Education (MHRD) to pursue advanced studies in CSE.
- Credited 8 UG level highly competitive CSE courses and started exploring research topics.
- Served as a Teaching Assistant for 2 undergraduate CSE courses, supporting instruction and providing mentorship to students.

Education

2018 - 2021	**MS** (Computer Science & Engineering)	Indian Institute of Technology, Hyderabad, India	**8.0 / 10**
2010 - 2013	**BTech** (Electronics & Comm. Engineering)	Biju Patnaik University of Technology, Odisha, India	**7.8 / 10**
2007 - 2010	**Diploma** (Computer Science & Engineering)	UCP Engineering School, SCTEVT, Odisha, India	**80.21 %**
2006 - 2007	**Grade 10 - Secondary School Examination**	Board of Secondary Education, Odisha, India	**74.40 %**

Key Skills

Programming: C/C++, Python, Assembly, Debugging, Automation   **Machine Learning:** DNNs, PyTorch, Scikit-Learn, LLMs, Generative AI
Tools/Utilities: Linux, bash, git, perf, Verdi, LaTeX   **Hardware/Systems:** x86, arm, VLIW, DSP, SystemVerilog, Performance Verification, SoC

Publication

- **DKB Achary**, RSC Teja, CK Mohan, B Panda, and S Mittal, **"Inferring DNN layer-types through a hardware performance counters based side channel attack"**. In *ACM International Conference on AI-ML Systems*, Oct 2021, Bangalore, India. *(PPT Link)*

Achievements

2015	**Scored 535/1000 & ranked top 3% in 115425 candidates**, Graduate Aptitude Test in Engineering	*India*
2013	**Received merit scholarship, awarded to top 1% of students**, Govt. of Odisha, India - UG Engineering	*India*
2010	**Achieved 53rd Rank - Top 1%**, Odisha Joint Entrance Examination (OJEE) - Engineering Lateral Entry	*India*

Projects

Reverse Engg. Layer-profile of DNNs using Hardware Perf. Counters Primary Advisor: Dr. Biswabandan Panda *Aug 2019 - Jun 2021*
- Researched hardware architectures for deep learning and DNN security vulnerabilities through a comprehensive literature survey.
- Conceived a novel attack to reverse-engineer DNN architectures utilizing hardware performance monitoring counters (PMCs).
- Developed and successfully executed the attack, achieving >90% accuracy in determining DNN layer distributions.

Automated Text Summarization Course Project Under Dr. Maunendra Sankar Desarkar *Aug 2018 - Nov 2018*
- Developed custom word embeddings by integrating ConceptNet Numberbatch with word2vec, GloVe, and OpenSubtitles 2016 data for enhanced semantic representation.
- Designed an abstractive text summarization model featuring a Bi-directional RNN encoder and an attention-based decoder.
- Implemented and refined the model using a two-layer LSTM with dropout for regularization to improve summarization accuracy.

Real-time Object Detection and Classification on Mobile Platforms Course Project Under Prof. C Krishna Mohan *Aug 2018 - Nov 2018*
- Developed & deployed an Android application utilizing a MobileNetV2-SSD model for real-time object detection & classification.
- Researched cutting-edge DNN architectures and training techniques to inform model selection and optimization strategies.
- Trained and fine-tuned a model using transfer learning, achieving successful deployment via TFLite for mobile optimization.

Routing Questions for Collaborative Answering in Community QA Course Project Under Dr. Manish Singh *Jan 2018 - Apr 2018*
- Applied topic modeling techniques to cluster questions based on domain, facilitating targeted answerer recommendations.
- Developed a Naive Bayes classifier to predict potential answerers, incorporating factors such as availability and question tags.
- Analyzed a large-scale Stack Exchange (Software Engineering) dataset containing approximately 500,000 questions to train and evaluate the system.

Advanced Courses

Hardware Architecture for Deep Learning **|** Advanced Computer Architecture **|** Secure Memory Systems **|** Topics in Data Mining
Visual Big Data Analytics **|** Computer and Network Security **|** Information Retrieval

Social Interests

Sports & Adventure   Badminton, Cycling, Travelling, Trekking   **Artistic & Creative**   Blogging & Vlogging, Photography, Music

Referees

Prof. C Krishna Mohan	**Dr. Sangyeol Kang**
Affiliation: IIT Hyderabad, Telangana, India **Position**: Professor **E-mail**: ckm@cse.iith.ac.in **Webpage**: people.iith.ac.in/ckm	**Affiliation**: Samsung Electronics, CA, USA **Position**: VP Technology **E-mail**: kang.sangyeol@gmail.com **LinkedIn**: linkedin.com/in/sangyeol-kang-0b90aa47