

ANANTH KRISHNA PRASAD

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Permanent Address

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EDUCATION

Doctor of Philosophy, Computer Science
University of Utah GPA 3.856

August 2018 - *Present*

Bachelors in Technology, Electronics and Communication Engineering
Birla Institute of Technology and Science, Pilani (Hyderabad Campus), India
GPA - 8.35 out of 10

August 2013 - May 2017

RESEARCH INTERESTS

- Emerging memory technologies
- Processing-in-Memory
- Hardware acceleration of deep learning

ACADEMIC EXPERIENCE

Selected Projects:

Graduate Research Assistant
School of Computing, University of Utah, UT
Advisor: Dr. Mahdi Nazm Bojnordi

August 2018 - *Present*

- **Hardware Acceleration of Machine Learning** - currently working on developing a novel data representation to reduce bandwidth and computational complexity of Convolutional Neural Networks (CNNs).
- **High Bandwidth Cross Caching** - Developed a novel reconfigurable memristor based memory with high bandwidth efficiency, with capability of large scale parallel search. Demonstrated cache/scratchpad reconfigurability and achieved 50% and 12x improvement over state-of-the-art High Bandwidth memory, over Cache and Hash Table/Stringmatch applications respectively.
- **Memristive Ranking In Memory** - Identified bandwidth bottleneck issues with sorting kernels, and proposed propose a viable hardware/software mechanism for performing large-scale data ranking in ReRAM based memory with a bandwidth complexity of $O(1)$, by reformulating sorting operations as bit-level in-situ operations. Achieved 12.4 - 50.7x throughput gains for high-performance parallel sorting kernels and 2.3 - 43.6x improvements in a set of database applications, with 90% energy reduction.
- **Reconfigurable Transistors** - Did a survey of TIGFET, an emerging reconfigurable nanotechnology and qualified it's implication for computer architects.

Research Assistant
Indian Institute of Science, Bangalore, India
Advisor: Prof. S.K Nandy

July 2017 - June 2018

- Implemented and validated Worst Case Execution Time (WCET) analysis over REDEFINE hardware for validation of safety-critical application execution.

Publications:

- **Memristive Data Ranking**, Ananth Krishna Prasad, Morteza Rezaalipour, Masoud Dehyadegari, Mahdi Nazm Bojnordi, International Symposium on *High Performance Computer Architecture (HPCA)*, 2021

Blogposts:

- [A case for the scope of reconfigurable transistors in computer architecture](#)
- [A case for optical deep neural networks](#)

Posters:

- [High Bandwidth Cross Caching](#), presented at DAC 2020

INDUSTRY EXPERIENCE

Intern

Analog Devices India, Bangalore

Manager: Raka Singh

Jan 2017 - Jun 2017

- Implemented a modified version of the Alexnet CNN and XNOR-net models for car-parking occupancy detection.

Intern

Apexplus Technologies, Hyderabad

May 2016 - July 2016

- Configured an FPGA to act as a signal generator.

TECHNICAL SKILLS

- **Programming Languages:** C, C++, Python, Verilog
- **Frameworks:** Tensorflow, Caffe, ESESC, Cacti

HONORS

- Departmental Fellowship, School of Computing, University of Utah