Saurabh Raje

saurabh.mraje@gmail.com

EDUCATION

BITS PILANI
BE in Computer Science
May 2019 | Pilani, India

DELHI PUBLIC SCHOOL
July 2015| Gurgaon, India

LINKS

Blog:// **smr97.github.io**
Github:// **smr97**
LinkedIn:// **saurabhmraje**

COURSEWORK

UNDERGRADUATE

Parallel Computing
Neural Networks and Fuzzy Logic
Operating Systems
Compiler construction
Data Structures and Algorithms
Database Systems
Object Oriented Programming
Principles of Programming Languages
Computer Networks

SKILLS

PROGRAMMING LANGUAGES
Rust • Java • Python • C • C++

ML FRAMEWORKS
Tensorflow • Pytorch • Caffe

HPC FRAMEWORKS
OpenMPI • OpenMP • CUDA

HUMAN LANGUAGES
Marathi • Hindi • English • French

EXPERIENCE

IBM RESEARCH | Research Engineer
August 2019 – Present | Delhi, India

- Working with the HPC group to optimise deep language models (BERT).
- Co-developed a novel technique (PoWER-BERT) to accelerate BERT model.
- Also working on integrating this into IBM's *Watson NLU* product.

ETH ZURICH - SPCL LAB | Scientific Assistant
March 2019 - August 2019 | Zurich, Switzerland

- Used the *DACE* domain specific language to accelerate **deep learning**.
- Built a Tensorflow graph parser that would generate code for popular math operations on heterogenous computing platforms.
- Added graph transformations to language IR to generate faster kernels.

IBM RESEARCH | Research Intern
May 2018 – August 2018 | Delhi, India

- Worked on training **deep neural networks** under memory constraints.
- Implemented variable batch sizing to reduce training time by 20%.
- Developed a scalable optimization algorithm for **Tensor Tucker Decomposition**.

INRIA | Research Intern
September 2018 – February 2019 | Grenoble, France

- Worked on a new parallelization library *Rayon Adaptive* for the **Rust** language.
- This automatically parallelizes functional code using **adaptive task splitting**.
- Contributed to a visualisation framework *Rayon-Logs* that shows parallel runs.

PROJECTS

PEDESTRIAN DETECTION SYSTEM | Mercedes Benz Research

- **Won** the Daimler autonomous driving hackathon with a CNN model.
- Presented our solution at the **Mobile World Congress**.

ON-BOARD COMPUTER FOR A NANOSATELLITE | Team Anant

- Lead a student research initiative to build a computer for a nanosatellite.
- Wrote a parallel scheduler to run various mission critical modules.
- Wrote some kernel device drivers for CMOS sensors on an I2C bus.
- The satellite is scheduled for **launch by ISRO** in 2020.

PUBLICATIONS

[1] V. Chakaravarthy, S. Pandian, **Saurabh Raje**, and Y. Sabharwal. On optimizing distributed non-negative tucker decomposition. *ACM International Conference on Supercomputing,2019*.

[2] S. Goyal, A. R. Choudhary, V. Chakaravarthy, **Saurabh Raje**, Y. Sabharwal, and A. Verma. Power-bert: Accelerating bert inference for classification tasks, 2020.

[3] S. Islam, S. Balasubramaniam, P. Goyal, A. Sultana, L. Bhutani, **Saurabh Raje**, and N. Goyal. A rapid prototyping approach for high performance density-based clustering. In *2019 IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, pages 260–269, Oct 2019.

[4] **Saurabh Raje**, A. Goel, S. Sharma, K. Aggarwal, D. Mantri, and T. Kumar. Development of on board computer for a nanosatellite. *International Astronautical Congress,2017*.

[5] **Saurabh Raje**, S. Vaderia, N. Wilson, and R. Panigrahi. Decentralised firewall for malware detection. *International Conference on Advances in Computing, Communication and Control (ICAC3),2017*.