SUNIL KUMAR

Research Assistant at HiPeC Lab @ IIITD

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justasunil justasunil

EXPERTISE

Parallel Programming
Runtime Systems
Analysis and Design of Algorithms

PROGRAMMING LANGUAGE

C/C++ | Java | Python | gnu-make | bash | HTML | SQL | Shell scripting

TOOLS AND TECHNOLOGY

Git | Cuda-C | Linux | MPI | OpenMP | HCLIB | LIKWID | MATLAB | GUI

TECHNICAL LEARNING

GPU Computing
Computer Architecture
Information Retrieval
Machine Learning
Computer Vision

ACHIEVEMENT

- Google Cloud Platform Crash Course Certified in ML, Datascience, and App Development
- Cloud Computing and Distributed System Course Certified from NPTEL

HOBBIES & INTEREST

- Swimming
- Cycling

ABOUT ME

My research interest lies in High Performance Computing and building Parallel programming models and Runtime systems. My current focus is to design libraries for achieving energy efficiency in HPC.

EXPERIENCE

Research Assistant | HiPeC Lab @ IIITD

May 2021 – Present Delhi, India

- **Project Title: Energy efficiency in Distributed memory parallel programming**
  This project deals with the design and implementation of C/C++ library for achieving energy efficiency in MPI+OpenMP based parallel programming models. This project is in collaboration with the Lawrence Berkeley National Laboratory.
- **Co-Advising a B.Tech Research Project**
  This project aims to achieve energy efficiency in priority-aware work-stealing runtime.

Undergraduate Researcher | In Collaboration with Lawrence Berkeley National Laboratory

Jun 2020 – May 2021 Delhi, India

- **Project Title: Cuttlefish: Library for Achieving Energy Efficiency in Multicore Parallel Programs** (Under Review in SC'21 Conference)
  This paper proposes Cuttlefish, C/C++ library for achieving energy efficiency in multicore parallel programs running over Intel processors. Cuttlefish dynamically configure optimal core and uncore frequencies for processors, thereby improving its energy efficiency.

COURSE PROJECTS

- **Holistic Runtime Parallelism Management for Time and Energy Efficiency**
  Implemented ParallelismDial (PD) for dynamically adapting the total number of threads in a work-stealing runtime for achieving an energy efficient execution.
- **Image Segmentation using Level-set method on Heterogeneous System (CPU+GPU)**
  Level-set method requires a lot of computation but provides the best accuracy in segmentation. GPU provides massive parallelism on this method and gives a speedup of 10x on different images.
- **Game Application using Javafx**
  Built a user interactive game, "Plants vs. Zombies" using Javafx. The game was built using OOP concepts in Java.
- **Face Emotion Recognition Model**
  This model supports emotion recognition from the faces of people who were recorded on video or live on webcam. Built a deep learning model using CNN to achieve an accuracy of 73%.

EDUCATION

B.Tech (CSE) | IIITD CGPA: 7.0
Aug 2017 – July 2021 Delhi, India

12^{th} (CBSE) | R.P.V.V Perc: 82.4
July 2014 – Mar 2015 Delhi, India

10^{th} (CBSE) | Ramjas School CGPA: 7.8
July 2012 – Mar 2013 Delhi, India