Samiran Kawtikwar

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Interests: Operations Research, Supply Chain Analytics, Discrete Optimization

EDUCATION

University of Illinois Urbana-Champaign
PhD Operations Research
2020 - Ongoing | IL, USA

Indian Institute of Technology Delhi
B. Tech Production and Industrial Engineering
2014 - 2018 | Delhi, India
Department Rank 3

COURSEWORK

Integer Programming
Advanced network analysis
Applied Parallel Programming
Optimization of Large Systems
Convex Optimization
Combinatorial Optimization
Big graphs & social networks

Teaching Assistant
Facilities Planning and Design
Analysis of Data
Production Planning & Control
Intro to Operations Research

FOCUS AREAS

High-Performance Computing
Large-Scale Optimization
Parallel Programming

SKILLS

Programming
C++, CUDA, OpenMP,
Python, CuPy, Java

Tools
Gurobi, AMPL, SQL,
R, Matlab, networkX, CVX,
METIS, CUB, Nsight Compute

POSITIONS

At Schlumberger:
Empowerment team leader
At IIT Delhi:
Undergraduate Secretary, AIC
Publicity coordinator, Literati

INTERESTS

Badminton, Aquatics, Soccer,
and Traveling

RELEVANT PROJECTS

Large-Scale Network Optimization

GPU Accelerated large LAP Solver
With Rakesh Nagi | Nov 21 - Ongoing

- Developed a Primal-Dual to Dual transformation between Hungarian and JV algorithms to maximize computational performance.
- Deployed on a containerized supercomputer cluster to study scaling characteristics.
- Geomean time speedup of **17x** over the previous state-of-the-art implementations.

Accelerated Travelling Salesman Problem Solver
With Samhita Vadrevu, and Rakesh Nagi | Aug 20 - May 21

- Developed a staged integer programming formulation for TSP with tighter LP bounds.
- Implemented GPU accelerated subgradient procedure on the Lagrangian dual problem.
- Improved the gap using parallel column generation technique with GPUs.

Big Graphs Analysis

Threat detection in Social Networks
With Rakesh Nagi | Jul 22 - Ongoing

- Query based thread detection on ground intelligence SQL data from Iraq.
- Designed an Attributed Relational Graph (ARG) to represent the intelligence data.
- Detected all near matching networks in ARG using ranked subgraph enumeration.

Accelerated Subgraph enumeration in CUDA
With Rakesh Nagi, Wen-Mei Hwu, and IBM C^{3}SR | Aug 21 - Aug 22

- Developed the fastest GPU Subgraph Enumerator using CUDA with **7.8x** improvement.
- Deployed the application on a supercomputer cloud cluster and achieved strong scaling.
- Invented a dynamic load balancing technique to ensure comprehensive GPU utilization.

PROFESSIONAL EXPERIENCE

Schlumberger | Field Operations Engineer
Subsea Landing String Services (India, China, France) | July 18 – July 20

- Delivered safe and efficient offshore production operations for multinational clients.
- Completed Asia's deepest production wells with water depths greater than 2100m.
- Worked in multiple countries with people from diverse nationalities.

PUBLICATIONS AND PATENTS

1. **Principles and Practice of Parallel Programming (2023):** EPARSEC - Enhanced PARallel Subgraph Enumeration in CUDA **(Under-review)**.
2. **INFORMS Annual Meeting (2022):** Presented on PARSEC - PARallel Subgraph Enumeration in CUDA
3. **Design Patent (2016):** Successfully patented an innovative design of a bike cooling system based on evaporative cooling. **(India Patent #201611005811)**

AWARDS AND ACHIEVEMENTS

2021, 2022	Awarded **excellent teaching assistant** at UIUC.
2020-2021	Recipient of **Phil Ryan Graduate Fellowship** for excellent academic record.
2017-2018	**Semester Merit Award** for outstanding academic performance at IIT Delhi.
2015-2018	Maintained **Department Rank 3** through meritorious efforts over 4 years.
2014-2018	Awarded the prestigious **MCM scholarship** for all 4 undergraduate years.
2015-2016	Gold Medalist, Inter Hostel Water Polo.