



Samiran Kawtikwar

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Interests: Big-graph Algorithms, Discrete Optimization, High-Performance Computing

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
Convex Optimization
Combinatorial Optimization
Large scale Network Opt

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,

POSITIONS

at UIUC

Graduate Mentor, UIUC

at Schlumberger

Empowerment team leader, SLB

at IIT Delhi

Undergraduate Secretary, AIC
Publicity coordinator, Literati

INTERESTS

Badminton, Aquatics, Soccer,
and Traveling

PROFESSIONAL EXPERIENCE

Wayfair | OPERATIONS RESEARCH SCIENTIST INTERN

SnOP and 4-Walls (Boston, USA) | Jun - Aug 23

- Devised optimal headcount mix for warehouses through collaboration with stakeholders.
- Designed MIPs to model labor behavior, incorporated worker types, attrition, and overtime.
- Generated valuable insights for workforce planning; tool approved for pilot testing.

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.
- Received highest ratings from clients for efficient service delivery and communication.

RELEVANT PROJECTS

Large-Scale Network Optimization

GPU ACCELERATED RESOURCE CONSTRAINED ASSIGNMENT PROBLEM SOLVER

With Rakesh Nagi | Jun 23 - Ongoing

- Solved the lagrangian relaxation of the problem with LAP solver for optimum multipliers.
- Developing a GPU-based branch and bound framework to fully utilize all parallelism.

GPU ACCELERATED LARGE LINEAR ASSIGNMENT PROBLEM SOLVER

With Rakesh Nagi | Aug 22 - May 23

- Developed a transformation between Hungarian classical and tree algorithms.
- Only GPU accelerated solver that performs well for dense as well as sparse problems.
- Geomean time speedup of **6.14x** 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

ACCELERATED SUBGRAPH ENUMERATION IN CUDA

With Rakesh Nagi, Wen-Mei Hwu, and IBM C³SR | 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.

PUBLICATIONS AND PATENTS

1. **Journal of Parallel and Distributed Computing (JPDC' 23): HyLAC - Hybrid Linear Assignment solver in CUDA.** (*Under Review*)
2. **International Conference on Parallel Processing (ICPP '23): BEEP - Balanced Efficient subgraph Enumeration in Parallel.**
3. **International Conference on Information Fusion (FUSION' 23): Multi-Target Tracking with GPU-Accelerated Data Association Engine.**
4. **Design Patent (2016):** Successfully patented an innovative design of a bike cooling system based on evaporative cooling. (**India Patent #201611005811**)

AWARDS AND ACHIEVEMENTS

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| 2022, 2023 | 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. |
| 2014-2018 | Awarded the prestigious MCM scholarship for all 4 undergraduate years. |