Vinay Kumar

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Summary

I am a Ph.D. scholar in Computer Science at South Asian University in New Delhi. My research is focused on optical networks, including QoS-aware protocols, optimization, routing, MEC, and distributed resource allocation. I am eager to work on cutting-edge technologies to expand my skills and expertise.

Education

Ph.D Computer Science, South Asian University — New Delhi, India
Aug. 2019 to Jul. 2024

- **Supervisor:** Dr. Bijoy Chand Chatterjee
- **Affiliated to:** Laboratory for Optical Networking and Systems
- GPA: 6.5/9.0 (Coursework)
- **Coursework:** Numerical Optimization, Queueing Theory and Advance Data Structures and Algorithms.
- **Thesis Title:** Virtual optical network embedding over spectrally spatially elastic optical network.

M.Sc Informatics, University of Delhi — New Delhi, India
Aug. 2017 to Jul. 2019

- **Affiliated to:** Institute of Informatics and Communication, UDSC
- GPA: 6.15/10.0
- **Coursework:** Software Design & Programming, Algorithms and Data Structure, Computer System Architecture, Mathematical Foundation of Computing, Computer Communication and Networks, Database Systems, Operating Systems, Software Engineering, Information System Design, IT Planning & Management
- **Project Title:** Peer-to-peer (P2P) file sharing system for a grid network.

B.Sc Physical Sciences, University of Delhi — New Delhi, India
Aug. 2014 to Jul. 2017

- **Affiliated to:** Rajdhani College
- GPA: 58.6%

Publications

Conferences

Virtual optical network embedding in spectrally-spatially elastic optical networks considering dynamic scenarios — 27-28 Jun. 2024

V. Kumar, E. Oki, B. C. Chatterjee

Published in: 20th International Conference on IP/IoT_&_Processing + Optical Network (iPOP2024) **(iPOP 2024 proceedings)**

PDavXT: Partition-Based Crosstalk-Avoided Defragmentation Scheme for Spectrally-Spatially Elastic Optical Networks — 02-06 Jul. 2023

R. Khantwal, ***V. Kumar***, E. Oki, B. C. Chatterjee

Published in: 2023 23rd International Conference on Transparent Optical Networks (ICTON)
DOI: 10.1109/ICTON59386.2023.10207340

XTawVNE: Inter-Core and Inter-Mode Crosstalk-Aware Virtual Network Embedding in Spectrally-Spatially Elastic Optical Networks — 18-21 Dec. 2022

V. Kumar, J. Halder, E. Oki, B. C. Chatterjee

Published in: 2022 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)
DOI: 10.1109/ANTS56424.2022.10227772

Inter-Core and Inter-Mode Crosstalk-Avoided Virtual Network Embedding in Spectrally-Spatially Elastic Optical Networks 06-08 Jun. 2022

V. Kumar, J. Halder, A. Mitra, E. Oki, B. C. Chatterjee

Published in: 2022 IEEE 23rd International Conference on High Performance Switching and Routing (HPSR)
DOI: 10.1109/HPSR54439.2022.9831362

Journals

Shared Backup Path Protected Virtual Network Embedding Model in Spectrally-Spatially Elastic Optical Networks To be declared

V. Kumar, E. Oki, B. C. Chatterjee

Published in: Journal of Optical Communications and Networking
DOI: Under Review

Optimizing Virtual Network Embedding in Spectrally-Spatially Elastic Optical Networks: A Crosstalk-Aware Perspective To be declared

B. C. Chatterjee ***V. Kumar***, J. Halder, , E. Oki,

Published in: IEEE Transactions on Network and Service Management
DOI: Under Review

VNEavXT: Offline Virtual Network Embedding Model Considering Crosstalk-Avoided Approach in Spectrally-Spatially Elastic Optical Networks 03 Jul. 2024

V. Kumar, J. Halder, A. Mitra, E. Oki, B. C. Chatterjee

Published in: Transactions on Network Science and Engineering
DOI: 10.1109/TNSE.2024.3421246

Experience

Teaching Experience

Invited Talk, Kyoto University, Japan (During Ph.D) Kyoto, Japan
21 Jun. 2024

- Delivered an Invited talk titled "Comparisons of Resource Allocation Techniques to Mitigate Crosstalk for Virtual Optical Network Embedding in Spectrally-Spatially Elastic Optical Networks"

Teaching Assistant, South Asian University, India (During Ph.D) New Delhi, India
Jan. to May. 2023
&
Jan. to May. 2024
10 months

- Offered Computer Networks to 1^{st} year Master's students
- Offered Network Programming to 2^{nd} year Master's students

Research Experience

Research Assistant, South Asian University, India (During Ph.D) New Delhi, India
Feb. 2021 to Aug. 2023
2 years 6 months

- **Project title:** Efficient resource allocation for spectrally-spatially elastic optical networks
- **Funding Agency:** Core Research Grant, Science and Engineering Research Board (SERB), Govt. of India
- **Implementing agency:** South Asian University

Volunteering, Internships, and Hackathons

Volunteer, (Envisage 2019) New Delhi, India
Apr. 2019

- Led "Enigma" cyber-security event as Event Head during Envisage, the technical fest of IIC, UDSC
- Attracted 17 team registrations with an average of 2 members per team
- Recognized for organizing the best event at Envisage

Volunteer, (Google Machine Learning Workshop) — New Delhi, India, 9 Sep. 2018

- Successfully organized a workshop at the University of Delhi, conducted by Google, with 250 participants

Volunteer, (Internet and Mobile Association of India (IAMAI), Hackathon) — New Delhi, India, 25 Aug. 2018

- Conducted a Hackathon organised by IAMAI and National Informatics Centre, Govt. of India at the University of Delhi, South Campus

Intern, (Samarth eGov) — New Delhi, India, May 2018 to Aug. 2018, 4 months

- Oversaw University information management systems for central universities in India under the Samarth eGov project
- Managed university portals for efficient data handling and accessibility

Participant, (Open Gov Data Hackathon) — New Delhi, India, 15 Oct. 2017

- Developed "Ambuser" Android app at a 48-hour hackathon focused on "Road Safety on National Highways"
- Utilized data from Open Gov Data initiative
- App identifies emergencies on highways and sends SOS to relevant authorities

Projects

P2P file transferring application for local grid network — Jan. 2019

- Developed a peer-to-peer file-sharing application for the local grid network to enhance file transfer in a distributed way
- Used Java, socket, and multi-threading libraries

Certifications, Achievements, and Awards

Certifications

- Google Machine Learning Workshop
- Cybrary CompTIA network++
- Hardware-Assisted Security for Fog Computing-based IoT Networks (under the Karyashala Scheme – A SERB initiative)

Achievements

- **South Asian University fellowship:** Secured South Asian freeship and fellowship to support throughout PhD
- **Graduate aptitude tests for engineers (GATE):** Qualified GATE two times in 2019 & 2024
- **University Grants Commission-National Eligibility Test (UGC-NET):** Qualified UGC-NET for Assistant Professor two times in 2021 & 2024

Skills

Technology and Tools

- **Programming Languages:** Python, C/C++, JAVA, MATLAB, Bash
- **Database:** MySQL, Oracle Database
- **Development Tools:** Pycharm, Eclipse, Vscode
- **Virtualization Tools:** Virtual Machine, Dockers, Hypervisor, Kubernetes
- **Networks:** Wireshark, GNS, Mini-net, Nmap
- **Hardware:** Raspberry Pi, Zodiac OpenFlow switch
- **Mathematical programming:** GLPK, IBM CPLEX, AMPL
- **Operating System:** Linux, Windows, Macintosh
- **Version Control:** GIT

Skills & Proficiencies

- **Data Visualization:** Microsoft Power BI, Excel
- **Documentation management:** Microsoft Office, LATEX
- **Software:** Project (MSP), Adobe PhotoShop, Audition, Canva
- **Technical skills:** Statistical analysis, Algorithms, Virtualization, Mathematical modeling, Traffic modeling, Linear programming
- **Soft Skills:** Presentation, Planning, Organized, Creative Problem-Solving, Teamwork, Active Listening, Adaptability, Analytical Thinking, Eye for detail, Goal-oriented, Motivator & Leader, Problem-solving, Strategic thinking
- **Languages:** English, Hindi