Vivek Jain

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Networking and Systems
C/C++, Java, Python, Go

Education

- **University of California Riverside** — Riverside, CA, USA
  Pursuing Ph.D. advised by Dr. K. K. Ramakrishnan; GPA: 3.95 / 4 — *September 2019 - Present*
- **National Institute of Technology Karnataka** — Surathkal, Karnataka, India
  M.Tech in Computer Science and Engineering; GPA: 8.56 / 10 — *Aug 2016 - June 2018*
- **Shri Guru Gobind Singhji Institute of Engineering and Technology** — Nanded, MH, India
  B.Tech in Computer Science and Engineering; GPA: 8.35 / 10 — *Aug 2011 - June 2015*

Skills

- **Programming Languages:** C/C++, Python, Java, Go
- **Domain:** Computer Networks, Data center Networks, Cellular Networks, Operating Systems, Distributed Systems
- **Technologies:** Docker Containers, Microservices, Serverless, NOSQL, RPC, REST, Unit testing
- **Framework:** Kubernetes, Knative, Istio, Cassandra, gRPC, protobuf, Openstack, Linux device drivers, gTest
- **Build Systems and Version control:** Bazel, Make, waf, Git, Gerrit, Maven

Experience

- **ns-3** ***(Open Source)***
  Active contributor for TCP module — *Dec 2017 – Present*
  - Developed various AQM & TCP model: ECN, PRR, DCTCP, BBR, PI, BLUE, SFBlue
  - Serving as Google Code In & Google Summer of Code mentor for the ns-3 project from last 2 years
- **Tarana Wireless India Pvt. Ltd.** — Pune, India
  Network Software Engineer — *Jun 2018 – September 2019*
  - Responsible for integration of different control plane modules.
  - Developed a LTE-type BSR functionality which involved writing kernel module to estimate incoming traffic
  - Built a library to write and read from FPGA registers
- **IBM India Pvt. Ltd.** — Bangalore, India
  Software Engineering Intern (Extreme Blue Intern) — *May 2017 - Jul 2017*
  - Implemented a proof of concept that demonstrates Container Management on PowerVM platform by using OpenStack Heat, IBM Spectrum CFC.
  - Developed python automation scripts for easy installation and deployment of OpenStack with the IBM CFC.
- **Great Software Laboratory Pvt. Ltd.** — Pune, India
  Software Engineer — *Dec 2017 - Jan 2018*
  - Worked on the development of cloud security solution with an objective to secure the workload of user in a cloud-based environment.
  - Designed and developed a user interface using Vaadin GWT for orchestration of OpenStack cloud platform.

Academic Projects *(more on Github)*

- **CleanG:** This project involves redesigning the protocol used in core of cellular network with the aim to reduce latency.
- **Implementation of TCP BBR in ns-3** BBR is a congestion control algorithm proposed by Google for high bandwidth utilization while maintaining the lesser delay. This project also involved the implementation of pre-requisite features (such as pacing, rate sample, etc).
- **Implementation of ECN model for ns-3 TCP stack** ECN is congestion feedback mechanism widely deployed in the internet. *Status: This model is merged in the mainline of ns-3.*
- **Implementation of TCP DCTCP for ns-3 TCP** Data Center TCP (DCTCP) is a standard congestion control scheme used to provide high burst tolerance, low latency and high throughput in Data Center Networks (DCNs). *(Status: merged in mainline of ns-3)*

Publications

- A. Mohammakhan, K. Ramakrishnan, **V. Jain**. "CleanG - Improving the Architecture and Protocols for Future Cellular Networks With NFV" in IEEE/ACM Transactions on Networking. DOI: 10.1109/TNET.2020.3015946
- **Vivek Jain**, Thomas R. Henderson, and Mohit P. Tahiliani. "Data Center TCP in ns-3: Implementation, Validation and Evaluation." Proceedings of the 2020 Workshop on ns-3. 2020.
- **Jain, Vivek**, Viyom Mittal, and Mohit P. Tahiliani. "Design and implementation of TCP BBR in ns-3." Proceedings of the 10th Workshop on ns-3. 2018.
- Mittal, Viyom, **Vivek Jain**, and Mohit P. Tahiliani. "Proportional rate reduction for ns-3 TCP." Proceedings of the 10th Workshop on ns-3. 2018.
- **Jain, Vivek**, et al. "Implementation and validation of BLUE and PI queue disciplines in ns-3." Simulation Modelling Practice and Theory 84 (2018): 19-37.