

# Shiva Ketabi

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RESEARCH INTERESTS      ◇ **Network Systems, Software-Defined Networking, Congestion Control, Data Centre Networking, Machine Learning Applications in Networking**

EDUCATION      ◇ **Ph.D. in Computer Science**      May 2016 – Nov. 2022  
Department of Computer Science      **GPA: 4/4**  
University of Toronto, Toronto, Canada  
*Thesis:* Flow Consolidation for Congestion Control in Data Centers  
Supervisor: Yashar Ganjali

◇ **M.Sc. Degree in Computer Science**      Sep. 2014 – Apr. 2016  
Department of Computer Science      **GPA: 3.93/4**  
University of Toronto, Toronto, Canada  
*Thesis:* Dependence of TCP Performance on Congestion Control Parameters  
Supervisor: Yashar Ganjali

◇ **B.Sc. Degree in Computer/Software Engineering**      Sep. 2010 – Sep. 2014  
Department of Computer Engineering      **GPA: 17.73/20**  
Sharif University of Technology, Tehran, Iran  
*Thesis:* A Storage Structure for Databases using Apache Hadoop  
Supervisor: Hamid Beigy

WORK EXPERIENCE      ◇ **Senior Software Engineer at Huawei.**      Winter 2022 - Now  
Toronto, Canada  
Improving the performance of data center networking through design, implementation, and test of new congestion control and load balancing solutions.

◇ **Research Intern at Huawei.**      Summer 2020 - Fall 2021  
Toronto, Canada  
Researching on data center networking, designing congestion control protocols, and using reinforcement learning for computer networks management.

◇ **Student Researcher at Google Inc.**      Fall 2018 - Summer 2019  
Toronto, Canada  
Improving scalability of Andromeda, Google Cloud's network virtualization stack.

- ◇ **Software Engineer Intern at Google Inc.** Summer 2017  
Mountain View, US  
Improving scalability of Andromeda, Google Cloud's network virtualization stack.
- ◇ **Intern at ASR Gooyesh Pardaz Co.** Summer 2014  
Tehran, Iran  
Developing an Android messaging application with Persian speech recognition—the first Android application for speech to text in Persian.

PUBLICATIONS

- ◇ **Hierarchical Congestion Control (HCC): Fairness and Fast Convergence for Data Centers.**  
**Shiva Ketabi**, and Yashar Ganjali. IFIP Networking Conference 2022.  
Designing a system for Hierarchical Congestion Control (HCC) that enables cooperation among flows, and improves fairness and convergence with low communication and processing overheads.
- ◇ **METHODS, SYSTEMS AND DEVICES FOR NETWORK MANAGEMENT USING CONTROL PACKETS.**  
Mahmoud Bahnasy, **Shiva Ketabi**, Sepehr Abbasi, Yashar Ganjali, and Fenglin Li.  
U.S. Patent Application 17/488,893, filed March 30, 2023.
- ◇ **DWTCP: Ultra Low Latency Congestion Control Protocol for Data Centers.**  
Sepehr Abbasi\*, **Shiva Ketabi**\*, Ali Munir, Mahmoud Bahnasy, and Yashar Ganjali.  
Under review, Available on arXiv:2207.05624.  
Introducing a new congestion control signal (*Scout*) which provides fast signaling with low overhead, ultra low latency, and near zero queue size.
- ◇ **Correlation-Aware Flow Consolidation for Load Balancing and Beyond.**  
**Shiva Ketabi**, Matthew Buckley, Parsa Pazhooheshy, Faraz Farahvash, and Yashar Ganjali. ACM SIGMETRICS Performance Evaluation Review 2022.  
Proposing correlation-aware flow consolidation, which results in smoother flows, estimating with a higher confidence, and reducing over/undershooting of link capacities.
- ◇ **A Deep Reinforcement Learning Framework for Optimizing Congestion Control in Data Centers.**  
**Shiva Ketabi**, Hongkai Chen, Haiwei Dong, and Yashar Ganjali. To appear in IEEE/IFIP Network Operations and Management Symposium (NOMS) 2022.  
Building a framework for automatic and dynamic tuning of congestion control parameters in data centers.
- ◇ **Perfect is the Enemy of Good: Lloyd-Max Quantization for Rate Allocation in Congestion Control Plane.**  
**Shiva Ketabi**, and Yashar Ganjali. IEEE/IFIP Network Operations and Management Symposium (NOMS) 2020.

Suggesting orders of magnitude higher speeds for explicit rate allocation in data centres using Lloyd-max quantization of flow rates and showing the introduced error is negligible using real network traces.

- TEACHING EXPERIENCE
- ◇ **Teaching Assistantship, University of Toronto**
    - Software-Defined Networking, Computer Networks, Algorithm Design, Analysis and Complexity, Introduction to Computer Science, Introduction to the Theory of Computation
  - ◇ **Teaching Assistantship, Sharif University of Technology**
    - Theory of Machine Languages and Automata, Fundamentals of Programming in C++
- HONORS AND AWARDS
- ◇ **Golden Network Award**, Huawei's Data Center Lab. 2023.
  - ◇ **Ontario Graduate Scholarship**. 2020-2021.
  - ◇ **Bell Graduate Scholarship**. 2020-2021.
  - ◇ **Best poster award** in ICNP conference. 2019.
  - ◇ **Google's grant for Grace Hopper Celebration of Women in Computing**. 2017.
  - ◇ **Outstanding student award**: offer of admission for graduate studies exempted from entrance exam, Sharif University of Technology, Iran. 2014.
  - ◇ **Ranked in the top 0.1%** in Iran's Nationwide University Entrance Exam for Engineering and Applied Sciences. 2010.
- TECHNICAL SKILLS
- ◇ **Programming**: Java, C/C++, Go.
  - ◇ **Scripting & special-purpose**: Python, Matlab, TensorFlow, PyTorch, MySQL, Bash, Prolog, Tcl.
  - ◇ **Operating systems**: Linux, Windows, MAC OS.
  - ◇ **Network simulation**: ns-2, ns-3, Mininet.
- SELECTED COURSES
- ◇ **University of Toronto**
    - Software-Defined Networking, Decision Making under Uncertainty, Introduction to Machine Learning, Knowledge Representation and Reasoning, Algorithms for Genome Sequence Analysis, Academic Leadership in Computer Science, Topics in Ubiquitous Computing (Critical Computing), and Blockchain Technology.
  - ◇ **Sharif University of Technology**
    - Voluntarily taken Data & Network Security, System Dynamics, Computer Vision.