

Shihabur Rahman Chowdhury

CONTACT INFORMATION	DAVID R. CHERITON SCHOOL OF COMPUTER SCIENCE, UNIVERSITY OF WATERLOO 200 UNIVERSITY AVENUE WEST, WATERLOO, ON N2L 3G1, CANADA PHONE: +1-226-600-6566 EMAIL: shihab.buet@gmail.com, sr2chowdhury@uwaterloo.ca(alternate) HOMEPAGE: https://cs.uwaterloo.ca/~sr2chowd
RESEARCH INTERESTS	Networks, Systems, Algorithms
EDUCATION	PhD , Computer Science, <i>May 2012 - present</i> David R. Cheriton School of Computer Science, University of Waterloo Average: 92.6% Supervisor: Prof. Raouf Boutaba, David R. Cheriton School of Computer Science University of Waterloo B.Sc. in Computer Science and Engineering , <i>Dec 2004 - October 2009</i> Bangladesh University of Engineering and Technology (BUET) CGPA: 3.93/4.00 Rank: 2nd in a class of 125 Thesis: Algorithms in Bioinformatics Thesis Supervisor: Prof. Masud Hasan, Department of CSE, BUET
EMPLOYMENT	Research & Teaching Assistant MAY, 2012 - PRESENT David R. Cheriton School of Computer Science University of Waterloo, Canada Software Engineering Intern (Technical Infrastructure) MAY, 2014 - AUG, 2014 Google Inc. Mountain View, CA, USA Summer Research Intern (Services Research) MAY, 2013 - SEPT, 2013 IBM T.J. Watson Research Centre Yorktown Heights, NY, USA Lecturer NOVEMBER 2009 - APRIL 2012 Department of CSE, BUET, Dhaka, Bangladesh Instructor JANUARY 2010 - APRIL 2012 Bangladesh Korea Information Access Center Department of CSE, BUET, Dhaka, Bangladesh
AWARDS AND ACHIEVEMENTS	<ul style="list-style-type: none">• Ontario Graduate Scholarship, University of Waterloo, 2017 – 2018, 2015 – 2016• President Graduate Scholarship, University of Waterloo, 2017 – 2018, 2015 – 2016• Graduate Excellence Scholarship in CS, University of Waterloo, 2016 – 2017• Student Travel Grant, IFIP/IEEE IM 2017• Student Travel Grant, IEEE/IFIP NOMS 2016 (not availed), 2014• Best Paper Runner-up Award, HotPOST 2013 (in conjunction with IEEE ICDCS 2013)• GoBell Scholarship, University of Waterloo, 2013 – 2015• University Merit Scholarship, BUET, 2005 – 2008• Dean's List Award, BUET, 2005 – 2009• 6th Place, ACM ICPC Regional Contest Dhaka Site, 2007• 8th Place, ACM ICPC Regional Contest Dhaka Site, 2006• 1st Place, Math Olympiad 2003, Organized by Ministry of Science & ICT, Bangladesh

PUBLICATIONS

Articles in Peer Reviewed Journals

- [J7] Shahriar, N., Ahmed, R., **Chowdhury, S.R.**, Khan, A., Boutaba, R., and Mitra, J. Generalized Recovery from Node Failure in Virtual Network Embedding. *IEEE Transactions on Network and Service Management*, 14(2): 261–274.
- [J6] **Chowdhury, S.R.**, Ahmed, R., Khan, M.M.A., Shahriar, N., Boutaba, R., Mitra, J., and Feng, Z. Dedicated Protection for Survivable Virtual Network Embedding. *IEEE Transactions on Network and Service Management*, 13(4): 913–926.
- [J5] Bari, M.F, **Chowdhury, S.R.**, Ahmed, R., Boutaba, R., and Duarte, O. Orchestrating Virtualized Network Functions. *IEEE Transactions on Network and Service Management*, 13(4): 725–739.
- [J4] Ahmed, R., Bari, M.F, **Chowdhury, S.R.**, Rabbani, M., Boutaba, R., and Mathieu, B. α Route: Routing on Names. *IEEE/ACM Transactions on Networking*, 24(5): 3070–3083.
- [J3] **Chowdhury, S.R.**, Roy, A.R., Shaikh, M., and Daudjee, K. A Taxonomy of Decentralized Online Social Networks. *Peer-to-Peer Networking and Applications, Springer*, 8(3): 367–383.
- [J2] **Chowdhury, S.R.**, Hasan, M.M., Iqbal, S., and Rahman, M.S. Computing a Longest Common Palindromic Subsequence. *Fundamenta Informaticae, IOS Press*, 129(4): 329–340.
- [J1] Bari, M.F, **Chowdhury, S.R.**, Ahmed, R., Boutaba, R., and Mathieu, B. A Survey of naming and routing in Information Centric Networks. *IEEE Communications Magazine*, 50(12) : 44–53.

Articles in Peer Reviewed Conferences & Workshops

- [C19] **Chowdhury, S.R.**, Ayoubi, S., Ahmed, R., Shahriar, N., Boutaba, R., Mitra, J, and Liu, L. MULE: Multi-Layer Virtual Network Embedding. *IEEE/ACM/IFIP Conference on Network and Service Management (CNSM), 2017*.
- [C18] Shahriar, N., **Chowdhury, S.R.**, Ahmed, R., Khan, A., Boutaba, R., Mitra, J, and Liu, L. Joint Backup Capacity Allocation and Embedding for Survivable Virtual Networks. *IFIP Networking 2017*.
- [C17] **Chowdhury, S.R.**, Ahmed, R., Shahriar, N., Khan, A., Boutaba, R., Mitra, J, and Liu, L. ReViNE: Reallocation of Virtual Network Embedding to Eliminate Substrate Bottlenecks. *IEEE/IFIP Integrated Network Management Symposium (IM), 2017*, pp. 116–124.
- [C16] Shahriar, N., Ahmed, R., Khan, A., **Chowdhury, S.R.**, Boutaba, R., and Mitra, J. ReNoVatE: Recovery from Node Failure in Virtual Network Embedding. *ACM/IEEE/IFIP Conference on Network and Service Management (CNSM), 2016*, pp. 19–27.
- [C15] Roy, A.R, **Chowdhury, S.R.**, Bari, M.F, Ahmed, R., and Boutaba, R. Emulating an Infrastructure with EASE. *IEEE/ACM/IFIP Conference on Network and Service Management (CNSM), 2016 (Mini-Conference)*, pp. 167–173.
- [C14] **Chowdhury, S.R.**, Ahmed, R., Khan, M.M.A., Shahriar, N., Boutaba, R., Mitra, J., and Zeng, F. Protecting Virtual Networks with DRONE. *IEEE/IFIP Network Operations and Management Symposium (NOMS), 2016*, pp. 78–86. **[Runner-up for Best Paper Award]**
- [C13] Shahriar, N., Ahmed, R., **Chowdhury, S.R.**, Khan, M.M.A., Boutaba, R., Mitra, J., and Zeng, F. Connectivity-aware Virtual Network Embedding. *IFIP Networking Conference, 2016*, pp. 46–54.
- [C12] Dolberg, L., François, J., **Chowdhury, S.R.**, Ahmed, R., Boutaba, R., and Engel, T. A Generic Framework to Support Application-Level Flow Management in Software-Defined Networks. *IEEE Conference on Network Softwarization, 2016*, pp. 121–125. (Short paper)
- [C11] Bari, M.F, **Chowdhury, S.R.**, Ahmed, R., and Boutaba, R. nf.io: A File System Abstraction for NFV Orchestration. *IEEE NFV-SDN Conference, 2015*, pp. 135–141.

- [C10] Bari, M.F., **Chowdhury, S.R.**, Ahmed, R., and Boutaba, R. On Orchestrating Virtual Network Functions. *IEEE/ACM/IFIP Conference on Network and Service Management (CNSM)*, 2015, pp. 50–56.
- [C9] Ahmed, R., **Chowdhury, S.R.**, Pokluda, A., Bari, M.F., Boutaba, R., and Mathieu, B. pWeb: A Personal Interface to the World Wide Web. *IFIP Networking Conference*, 2014, pp. 1–9.
- [C8] **Chowdhury, S.R.**, Adam, C., Wu, F., Rofrano, J. and Boutaba, R. Managing the File System from the Kernel. *IEEE/IFIP Network Operations and Management Symposium (NOMS)*, 2014, pp. 1–8.
- [C7] **Chowdhury, S.R.**, Bari, M.F., Ahmed, R., and Boutaba, R. PayLess: A Low Cost Network Monitoring Framework for Software Defined Networks. *IEEE/IFIP Network Operations and Management Symposium (NOMS)*, 2014, pp. 1–9.
- [C6] Bari, M.F., **Chowdhury, S.R.**, Ahmed, R., and Boutaba, R. PolicyCop: An Autonomic QoS Policy Enforcement Framework for Software Defined Networks. In proceedings of *IEEE SDN for Future Network and Services (SDN4FNS)*, 2013, pp. 1–7.
- [C5] Bari, M.F., Roy, A.R., **Chowdhury, S.R.**, Zhang, Q., Zhani, M.F., Ahmed, R., and Boutaba, R. Dynamic Controller Provisioning in Software Defined Networks. *IEEE/ACM/IFIP Conference on Network and Service Management (CNSM)*, 2013, pp. 18–25. **[Runner-up for Best Paper Award]**
- [C4] Shahriar, N., **Chowdhury, S.R.**, Sharmin, M., Ahmed, R., Boutaba, R., and Mathieu, B. Ensuring β -availability in P2P Social Networks. *Workshop on Hot Topics in Peer-to-peer Computing and Online Social Networking, 2013 (IEEE ICDCS 2013 Workshops)*, pp. 150–155. **[Best Paper Runner-up Award]**
- [C3] Ahmed, R., Bari, M.F., **Chowdhury, S.R.**, Rabbani, M., Boutaba, R., and Mathieu, B. α Route: A Name Based Routing Scheme for Information Centric Networks. *IEEE INFOCOM*, 2013, pp. 90–94.
- [C2] **Chowdhury, S.R.**, Iqbal, S., Hasan, M.M., and Rahman, M.S. Computing a Longest Common Palindromic Subsequence. *International Workshop on Combinatorial Algorithms (IWOCA) 2012*, LNCS 7643:219–223.
- [C1] Iqbal, S., **Chowdhury, S.R.**, Hyder, C.S., Vasilakos, A.V., and Wang C. Vehicular Communication: Protocol Design, Testbed Implementation and Performance Analysis. *ACM International Conference on Wireless Communication and Mobile Computing (IWCMC)*, 2009, pp. 410–415.

Patent Applications

- [P4] Shahriar, N., Khan, A., Ahmed, R., Mitra, J., **Chowdhury, S.R.**, and Boutaba, R. System and Method for Joint Embedding and Backup Provisioning in Virtual Networks. US Provisional Patent Application No. 62/368,936, July 2016.
- [P3] Shahriar, N., Mitra, J., **Chowdhury, S.R.**, Ahmed, R., and Boutaba, R. Methods and Systems for Failure Recovery in a Virtual Network Environment. US Patent Application No. 15/267,696, May 2016.
- [P2] **Chowdhury, S.R.**, Mitra, J., Ahmed, R., Shahriar, N., and Boutaba, R. Dedicated Protection for Virtual Network Embedding. US Provisional Patent Application No. 62/218,052, September 2015
- [P1] Ahmed, R., Mitra, J., Shahriar, N., **Chowdhury, S.R.**, and Boutaba, R. Connectivity-Aware Virtual Network Embedding. US Patent Application No. 15/048,573., July 2015

Book Chapter(s)

- [B1] Dolberg, L., François, J., **Chowdhury, S.R.**, Ahmed, R., Boutaba, R., and Engel, T. Network Configuration and Flow Scheduling for Big Data Applications. *Networking for Big Data*. S. Yu, X. Lin, J. Mistic, and X. Shen (editors). pp. 121–138, CRC Press, 2015.

Posters and Demos

- [D1] Bari, M.F., Chowdhury, S.R., Ahmed, R., and Boutaba, R. nf.io: A File System Abstraction for NFV Orchestration. ACM SIGCOMM 2015, London, UK.

Talks

- [T11] Joint Backup Capacity Allocation and Embedding for Survivable Virtual Networks. *IFIP Networking, 2017, Stockholm, Sweden.*
- [T10] ReViNE: Reallocation of Virtual Network Embedding to Eliminate Substrate Bottlenecks. *IFIP/IEEE IM, 2017, Lisbon, Portugal.*
- [T9] Emulating an Infrastructure with EASE. *IEEE/ACM/IFIP CNSM Mini-conference, 2016, Montreal, Canada.*
- [T8] Management and Orchestration of Service Function Chains in NFV. *BUET ACM Chapter Talk Series, 2015, Dhaka, Bangladesh.*
- [T7] nf.io: A File System Abstraction for NFV Orchestration. *IEEE NFV-SDN Conference 2015, San Francisco, USA.*
- [T6] PayLess: A Low Cost Network Monitoring Framework for Software Defined Networks. *IEEE/IFIP NOMS 2014, Krakow, Poland.*
- [T5] Managing the Filesystem from the Kernel. *IEEE/IFIP NOMS 2014, Krakow, Poland.*
- [T4] Towards Autonomic Management of File Systems. *Services Research Seminar Series, IBM T.J. Watson Research Center, Yorktown Heights, NY, USA.*
- [T3] Ensuring β -availability in P2P Social Networks. *HotPOST 2013 workshop, Philadelphia, USA*
- [T2] α Route: A Name Based Routing Scheme for Information Centric Networks. *ICN Workshop, Orange Labs, France. June 2013.*
- [T1] α Route: A Name Based Routing Scheme for Information Centric Networks. *IEEE INFOCOM 2013, Turin, Italy.*

RESEARCH EXPERIENCES

- Currently working under the supervision of Prof. Raouf Boutaba on the following topics:
 - Network softwarization
 - Resource allocation in Virtual Networks
- Worked with Dr. Khuzaima Daudjee (University of Waterloo) on devising a taxonomy of Decentralized Online Social Networks.
- Worked at Services Research division, IBM TJ Watson Research Centre on autonomic management of file systems.
- Worked with Prof. M. Sohel Rahman (CSE, BUET) on the following topics:
 - Algorithm for variants of sequence alignment problem.
 - Meta-heuristic algorithms for *Vehicle Routing Problem with Soft Time Windows*.

TECHNICAL SKILLS

Language	C/C++, Java, Python, x86 Assembly, PHP, HTML, Bash Script, \LaTeX
API and Frameworks	OpenGL, IBM ILOG CPLEX, Symphony2, Propel, Floodlight Controller
Infrastructure tools	OpenStack, Docker, Libvirt
Database	Oracle 9i/10g, MySQL, SQLite, Cassandra, MongoDB
Simulators	Packet Tracer, Mininet, ns3

**PROFESSIONAL
ACTIVITIES**

- Member, Organizing Committee, *WALCOM* 2010 and 2012.
- External reviewer: FONDECYT-CHILE – National Fund for Scientific and Technological Development (Chile), *ACM/IEEE Transactions on Networking*, *IEEE Transactions on Parallel and Distributed Systems*, *IEEE Transactions on Cloud Computing*, *IEEE Transactions on Network and Service Management*, *IEEE Transactions on Communications*, *IEEE Communications Magazine*, *IEEE Network Magazine*, *IEEE Communication Letters*, *Elsevier Computer Networks*, *Elsevier Computer Communications*, *PLoS One*, *IEEE ICDCS 2016*, *IEEE/ACM/IFIP CNSM 2015/2017*, *IEEE/IFIP IM 2017*, *IEEE ICC 2017*, *IEEE/IFIP NOMS 2014/2016*, *IEEE NFV-SDN 2016/2017*, *IEEE CloudNet 2017*, *IEEE SDN4FNS 2013*, *IEEE CCGrid 2014*, *IFIP Networking 2014/2015*, *WALCOM 2011*.

REFERENCES

Available upon request.