Mohammad Rajiullah, Ph.D.

dr.mohammad.rajiullah@gmail.com
https://github.com/mrajiullah
https://www.linkedin.com/in/mrajiullah/

Employment History

2018 – Present **Research Engineer,** Karlstad University, Sweden.

2016 – 2018 **Postdoctoral Fellow,** Karlstad University, Sweden.

2009 – 2015 **Ph.D Fellow,** Karlstad University, Sweden.

2008 – 2009 **Lecturer,** Independent University, Bangladesh.

2003 – 2005 **Lecturer,** Asian University of Bangladesh.

Education

2015 **Ph.D in Computer Science,** Karlstad University.
Thesis title: *Towards a Low Latency Internet: Understanding and Solutions.*

2012 **Licentiate in Computer Science,** Karlstad University.
Thesis title: *Performance Analysis and Improvement of PR-SCTP in an Event Logging Context.*

2007 **M.Sc. in Global Information and Telecommunication Studies,** Waseda University, Tokyo, Japan.
Thesis title: *An Energy Efficient Deterministic Clustering Based Communication Scheme for Wireless Sensor Network.*

2002 **B.Sc. in Computer Science and Information Technology,** Islamic University of Technology, Dhaka, Bangladesh.
Thesis title: *Computer Representation of Bangla Characters and Sorting of Bangla Words.*

Research Projects

2018 – Present **DIGITALWELL**
Development of digital welfare services with the user's needs in focus (DIGITALWELL)
https://www.digitalwellarena.se/projekt/digitalwell/

- Total budget for phase 2: 20 120 000 SEK.
- Budget for Computer Science dept. at Karlstad University: 14 400 000 SEK.

Research Projects (continued)

2019 – 2021

EU H2020 5GENESIS
5th Generation End-to-end Network, Experimentation, System Integration, and Showcasing (5GENESIS)
https://www.5genesis.eu

- Total budget: 15 766 793 Euro.
- Budget for Karlstad University: 445 625 Euro.

Contributed project deliverables

- Deliverable D3.5: Monitoring and Analytics (Release A).
- Deliverable D3.6: Monitoring and Analytics (Release B).
- Deliverable D4.10 (Not Public): The Surrey Platform (Release A).
- Deliverable D4.12: The Surrey Platform (Release C).
- Deliverable D5.3: Documentation and supporting material for 5G stakeholders (Release A).
- Deliverable D6.3: Trials and experimentation (cycle 3).

2016 – 2018

EU H2020 MONROE
Measuring Mobile Broadband Networks in Europe
https://www.monroe-project.eu

- Total budget: 6 542 419 Euro.
- Budget for Karlstad University: 398 140 Euro.

Contributed project deliverables

- Deliverable 3.1: Experimental SW as EaaS.

EU H2020 NEAT
A New, Evolutive API and Transport-Layer Architecture for the Internet
https://www.neat-project.org

- Total budget: 3 957 001 Euro.
- Budget for Karlstad University: 467 188 Euro.

Contributed project deliverables

- Deliverable 3.1: Initial Report on the Extended Transport System.
- Deliverable 3.3: Extended Transport System and Transparent Support of Non-NEAT Applications.

Research Projects (continued)

2012 – 2015

EU FP7 RITE
Reducing Internet Transport Latency
https://www.riteproject.eu

- Total budget: 3 569 000 Euro.
- Budget for Karlstad University: 458 799 Euro.

Contributed project deliverables

- Deliverable 1.2: Report on design and initial evaluation of end-system, application-layer and API mechanisms.
- Deliverable 1.3: Report on prototype development and evaluation of end-system, application layer and API mechanisms.
- Deliverable 2.3: Report on Prototype Development and Evaluation of Network and Interaction Techniques.
- Deliverable 3.3: Deployment of RITE mechanisms in use-case trial testbeds report.

Research Experience

2018 – Present

Research Engineer
Dept. of Computer Science
Karlstad University

- Researcher in national project DIGITALWELL
- Researcher in EU H2020 project 5GENESIS (Completed in December, 2021).
- Analysis of 5G performance in both operational network and a testbed setup.
- Integration of MONROE project capabilities in 5GENESIS project.
- MONROE based 5G performance measurements in 5GENESIS.
- Design of the 5GENESIS experimentation methodology.
- Analysis of energy saving in cellular IoT.
- Extension of MONROE platform with IoT capabilities (NB-IoT, LoRaWAN).
- Analysis and measurement of NB-IoT performance.
- Analysis and measurement of Web performance in operational network.

2016 – 2018

Postdoctoral Fellow, extended to Project Assistant, Research
Dept. of Computer Science
Karlstad University

- Researcher in EU H2020 project MONROE and NEAT.
- Measurement of web browsing performance in operational mobile network under MONROE.
- Performance analysis of transport features on users web browsing experience under NEAT.

Research Experience (continued)

2009 – 2015

Ph.D Fellow extended to Project Assistant, Research
Dept. of Computer Science
Karlstad University

- Researcher in EU FP7 project RITE.
- Optimizations at the transport layer (TCP and SCTP) for low latency Internet.
- Implementation of transport layer optimization in both Linux and FreeBSD operating system.
- Longitudinal analysis of Internet traffic in relation to latency sensitive traffic.
- Classification of Internet traffic using machine learning.

Research Publications

Journal Articles

1. Abbas, M. T., Grinnemo, K.-J., Eklund, J., Alfredsson, S., **Rajiullah, M.**, Brunstrom, A., … Alay, O. (2022). Energy-saving solutions for cellular internet of things–a survey. *IEEE Access*, *10*, 62073–62096. doi:10.1109/ACCESS.2022.3182400

2. Ali, U., Caso, G., De Nardis, L., Kousias, K., **Rajiullah, M.**, Alay, Ö., … Di Benedetto, M.-G. (2022). Data-driven analysis of outdoor-to-indoor propagation for 5g mid-band operational networks. *Future Internet*, *14*(8), 1–27. doi:10.3390/fi14080239

3. Ali, U., Caso, G., Nardis, L. D., Kousias, K., **Rajiullah, M.**, Alay, Ö., … Benedetto, M. D. (2022). Large-Scale Dataset for the Analysis of Outdoor-to-Indoor Propagation for 5G Mid-Band Operational Networks. *Data*, *7*(3), 34. doi:10.3390/data7030034

4. Mancuso, V., Quirós, M. P., Lutu, A., Alay, Ö., Alfredsson, S., **Rajiullah, M.**, … Hirsch, T. (2019). Results from running an experiment as a service platform for mobile broadband networks in Europe. *Comput. Commun.*, *133*, 89–101. doi:10.1016/j.comcom.2018.09.004

5. Mohideen, A. I. C., **Rajiullah, M.**, Secchi, R., Fairhurst, G., Brunström, A., & Weinrank, F. (2019). Evaluating the impact of transport mechanisms on web performance for effective web access. *J. Netw. Comput. Appl.*, *137*, 25–34. doi:10.1016/j.jnca.2019.04.006

6. **Rajiullah, M.**, Hurtig, P., Brunström, A., Petlund, A., & Welzl, M. (2015). An Evaluation of Tail Loss Recovery Mechanisms for TCP. *ACM SIGCOMM Computer Communication Review*, *45*(1), 5–11. doi:10.1145/2717646.2717648

7. **Rajiullah, M.**, Lundin, R., Brunström, A., & Lindskog, S. (2013). Performance analysis and improvement of PR-SCTP for small messages. *Comput. Networks*, *57*(18), 3967–3986. doi:10.1016/j.comnet.2013.09.018

8. Habib, M. A., Pawdel, K. P., **Rajiullah, M.**, & Shrestha, P. M. (2008). Constraint-based Trend Template for Intrusion Detection. *J. Softw.*, *3*(6), 21–28. doi:10.4304/jsw.3.6.21-28

9. **Rajiullah, M.**, Siddique, M., & Akhtaruzzaman, M. (2008). Deterministic clustering based communication scheme for energy constrained wireless sensor network. *Journal of Electronics and Computer Science*, *9*, 1–9.

Conference Proceedings, Poster and Demo

1. Kousias, K., **Rajiullah, M.**, Caso, G., Alay, Ö., Brunström, A., Nardis, L. D., … Benedetto, M. D. (n.d.). Coverage and Performance Analysis of 5G Deployments in Europe. Accepted for publication in WiNTECH@MobiCom 2022: Proceedings of the 16th International Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization, Sydney, Austratlia, October 17, 2022.

2. Abbas, M. T., Eklund, J., Grinemmo, K.-J., Brunström, A., Alfredsson, S., **Rajiullah, M.**, … Alay, Ö. (2022). On the Efficient Use of Discontinuous Reception and Release Assistance in NB-IoT. In *The IEEE 8th World Forum on Internet of Things (IEEE WFIoT) 2022, Yokohama, Japan, 26 October–11 November 2022.* New York: IEEE Communications Society.

3. Kousias, K., **Rajiullah, M.**, Caso, G., Alay, O., Brunstrom, A., De Nardis, L., … Di Benedetto, M.-G. (2022). Implications of handover events in commercial 5g non-standalone deployments in rome. In *Proceedings of the acm sigcomm workshop on 5g and beyond network measurements, modeling, and use cases* (pp. 22–27). doi:10.1145/3538394.3546041

4. Khatouni, A. S., Trevisan, M., Giordano, D., **Rajiullah, M.**, Alfredsson, S., Brunström, A., … Alay, Ö. (2020). An Open Dataset of Operational Mobile Networks. In *Proceedings of the 18th ACM international symposium on mobility management and wireless access, mobiwac 2020, alicante, spain, november 16-20, 2020* (pp. 83–90). doi:10.1145/3416012.3424619

5. **Rajiullah, M.**, Khatouni, A. S., Midoglu, C., Alay, Ö., Brunström, A., & Griwodz, C. (2020). Mobile Network Performance during the COVID-19 Outbreak from a Testbed Perspective. In *Wintech@mobicom 2020: Proceedings of the 14th international workshop on wireless network testbeds, experimental evaluation & characterization, london, uk, september 25, 2020* (pp. 110–117). doi:10.1145/3411276.3412194

6. Brunström, A., Alay, Ö., Karlsson, J., **Rajiullah, M.**, Hirsch, T., Caso, G., & Alfredsson, S. (2019). Poster: Extending the MONROE platform towards IoT and 5G networks. In *Internet measurement conference, amsterdam, netherlands, october 21, 2019*, ACM.

7. **Rajiullah, M.**, Lutu, A., Khatouni, A. S., Fida, M., Mellia, M., Brunström, A., … Mancuso, V. (2019). Web Experience in Mobile Networks: Lessons from Two Million Page Visits. In *The world wide web conference, WWW 2019, san francisco, ca, usa, may 13-17, 2019* (pp. 1532–1543). doi:10.1145/3308558.3313606

8. Fida, M., Kousias, K., Lutu, A., **Rajiullah, M.**, Alay, Ö., Brunström, A., & Argyriou, A. (2017a). Demo: Experimentation in Controlled and Operational LTE Settings with FLEX-MONROE. In *Proceedings of the 11th workshop on wireless network testbeds, experimental evaluation & characterization, wintech@mobicom, snowbird, ut, usa, october 20, 2017* (pp. 93–94). doi:10.1145/3131473.3133329

9. Fida, M., Kousias, K., Lutu, A., **Rajiullah, M.**, Alay, Ö., Brunström, A., & Argyriou, A. (2017b). FLEX-MONROE: A unified platform for experiments under controlled and operational LTE settings. In *Proceedings of the 11th workshop on wireless network testbeds, experimental evaluation & characterization, wintech@mobicom, snowbird, ut, usa, october 20, 2017* (pp. 1–8). doi:10.1145/3131473.3131477

10. **Rajiullah, M.**, Mohideen, A. C., Weinrank, F., Secchi, R., Fairhurst, G., & Brunström, A. (2017). Understanding multistreaming for web traffic: An experimental study. In *2017 IFIP networking conference, IFIP networking 2017 and workshops, stockholm, sweden, june 12-16, 2017* (pp. 1–6). doi:10.23919/IFIPNetworking.2017.8264875

11. Brunström, A., Petlund, A., & **Rajiullah, M.** (2013). Poster paper: Reducing Internet Transport Latency for Thin Streams and Short Flows. In *Future network and mobilesummit 2013 conference proceedings*.

12. **Rajiullah, M.**, & Brunström, A. (2012a). Performance improvement of PR-SCTP using Non-Renegable selective acknowledgements (NR- SACKs). In *8th swedish national computer networking workshop, sncnw* (pp. 86–89). Stockholm.

13 **Rajiullah, M.**, & Brunström, A. (2012b). Poster: Evaluation and analysis of NR-SACKs based PR-SCTP. In *Sail summer school, future of internet explained - today!*, Santander, Spain.

14 **Rajiullah, M.**, & Brunström, A. (2012c). Optimizing PR-SCTP performance using NR-SACKs. In *2nd baltic congress on future internet communications, BCFIC 2012, vilnius, lithuania, april 25-27, 2012* (pp. 222–229). doi:10.1109/BCFIC.2012.6217950

15 **Rajiullah, M.**, & Brunström, A. (2011a). Poster: Performance optimization of PR-SCTP for small messages. In *Ieee swedish communication technologies workshop (swe-ctw)*.

16 **Rajiullah, M.**, & Brunström, A. (2011b). Data modeling and transport of syslog messages. In *7th swedish national computer networking workshop, sncnw* (pp. 69–72). Linköping.

17 **Rajiullah, M.**, & Brunström, A. (2011c). On the effectiveness of PR-SCTP in networks with competing traffic. In *Proceedings of the 16th IEEE symposium on computers and communications, ISCC 2011, kerkyra, corfu, greece, june 28 - july 1, 2011* (pp. 898–905). doi:10.1109/ISCC.2011.5983956

18 **Rajiullah, M.**, Lundin, R., Brunström, A., & Lindskog, S. (2011). Syslog performance: Data modeling and transport. In *2011 third international workshop on security and communication networks (iwscn)* (pp. 31–37). doi:10.1109/IWSCN.2011.6827714

19 **Rajiullah, M.**, Brunström, A., & Lindskog, S. (2010). Priority Based Delivery of PR-SCTP Messages in a Syslog Context. In *Access networks - 5th international ICST conference on access networks, accessnets 2010 and first ICST international workshop on autonomic networking and self-management in access networks, SELFMAGICNETS 2010, budapest, hungary, november 3-5, 2010, revised selected papers* (Vol. 63, pp. 299–310). doi:10.1007/978-3-642-20931-4_23

20 **Rajiullah, M.**, & Shimamoto, S. (2007a). An Energy-Aware Periodical Data Gathering Protocol Using Deterministic Clustering in Wireless Sensor Networks (WSN). In *IEEE wireless communications and networking conference, WCNC 2007, hong kong, china, 11-15 march, 2007* (pp. 3014–3018). doi:10.1109/WCNC.2007.558

21 Zibran, M. F., Tanvir, A., **Rajiullah, M.**, & Sattar, M. A. (2002). Computer representation of Bangla characters and sorting of Bangla words. In *5th ieee international conference on computer and information technology* (pp. 191–195). Dhaka, Bangladesh.

Book Chapter

1 **Rajiullah, M.**, & Shimamoto, S. (2007b). Low Overhead Deterministic Cluster Heads Selection in Wireless Sensor Networks. In *Systems modeling and simulation* (pp. 450–454). Springer.

Teaching Experience

2009 – Present
Dept. of Computer Science
Karlstad University
Taught courses are - Internet of Things (IoT), Operating System, Topics in Computer Networking, Computer Networking, Perspective in Computer Science, Introduction to Computer Science, Bachelor Project

2008 – 2009
School of Engineering and Computer Science
Independent University, Bangladesh
Taught courses are - Computer Network, Telecommunication System I, Electronics I

Teaching Experience (continued)

2003 – 2005

Dept. of Computer Science
Asian University of Bangladesh
Taught courses are - Computer Networking, Object Oriented Programming, C programming

Supervision Experience

Ph.D. Co-supervision

Dept. of Computer Science
Karlstad University
Ph.D. candidate, Muhammad Tahir Abbas, preliminary thesis title: Improving Performance of Massive Machine Type Applications.

Administrative AND System Maintenance Experience

2018 – Present

Administrative and managerial duties as a part of being a Research Engineer at Karlstad University (2018 – Present)

- Administration of daily operation, maintenance and development of the departmental IT environment.
- Administration of the purchase process of computer hardware, software.
- Administration of Linux systems and other operating systems.
- System documentation.
- Managing virtual machines.
- Managing networks and firewalls.

Skills

Languages: Bengali (Native), English (fluent), Swedish (Moderate), Japanese (Basic)

Coding: C/C++, python, R, Perl, AWK, Bash, Matlab, Octave, Java, Node.js

- Python based web automation framework using selenium that can measure browsing experience from native firefox and chrome browser.
- Web browser emulator in C that works like a modern web browser and can use different HTTP and transport protocols.
- Packet trace analysis tool using C++.
- Tools for decision tree analysis on web performance data using the open source tool KNIME, scikit-learn and numpy libraries in python.
- Prototypes in Octave/Matlab of different machine learning algorithms.
- Numerous data processing tools using AWK, R.
- Python Matplotlib, R, Gnuplot based data visualization.
- Perl, bash for scripting.

Technology: Machine learning, docker, version control system (git), VMware, Keysight Test Automation Platform (TAP), Open Air Interface, OpenStack

Database: ORACLE 8i, SQL, MySQL, MS-Access, SQlite

Skills (continued)

Simulation	NS-2, NS-3
Type setting	LaTeX, Open Office
Operating System	Linux, Mac OS X, FreeBSD, MS Windows, Android, iOS

Professional Experience

Workshop Organisation

- 2021 — Technical Program Committee co-chair, 13th Swedish National Computer Networking Workshop (SNCNW), Halmstad, Sweden.

Conference/Workshop Program Committees

- 2017 — Artifact evaluation committee, ACM International Conference on emerging Networking. EXperiments and Technologies (CoNEXT)
- 2012 – 2016 — Technical Program Committee member, Swedish National Computer Networking Workshop (SNCNW).

Session Chairs

- 2015 — Session 1: Future Internet, Swedish National Computer Networking Workshop (SNCNW).
- 2012 — Session IV: Swedish National Computer Networking Workshop (SNCNW).

Reviews

- 2022 — IEEE Access.
- 2020 — IEEE Transactions on Network and Service Management.
- 2017 — Second MONROE (EU HORIZON2020 project) Open Call for Experiments and Extensions.
- 2016 — First MONROE (EU HORIZON2020 project) Competitive Open Call.
- International Symposium on Wireless Personal Multimedia Communications.
- 2012 – 2016 — Swedish National Computer Networking Workshop (SNCNW).
- 2010 — ACS/IEEE International Conference on Computer Systems and Applications.

Internet Engineering Task Force (IETF) Participation

- 2014 — IETF 89, London.
- 2013 — IETF 87, Berlin.

Memberships

- International — Association for Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), International Association of Engineers (IAENG).
- Swedish — The Swedish Association of University Teachers and Researchers (SULF).

Certification

- 2021 — 5G System overview, Apis Academy.

Professional Experience (continued)

Invited Talks

2015 — Guest lecture, title "Understanding the Latency Requirement in Today's Internet", at the Information Systems department, Karlstad University.

2008 — Speaker in the seminar on "Wireless Communications: GSM perspective", Asian University of Bangladesh.

Scholarship and Honors

2007 — Graduates representative at graduation ceremony at Waseda University, Japan.

2005 – 2007 — Japanese Grant Aid for Human Resource Development Scholarship (JDS) for masters study at Waseda University, Japan.

1999 — Merit Scholarship by the Government of Bangladesh for excellent result in higher secondary examination.

References

Available on Request