Md Masudur Rahman

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Research Interests

I am broadly interested in Artificial Intelligence, Reinforcement Learning, and Robotics. I work on designing and building intelligent learning agents, which can make interpretable critical decisions under uncertainty. In particular, I am working on the problem of generalization in reinforcement learning.

Education

Ph.D. Student in Computer Science.

- Purdue University, West Lafayette, IN, USA. Started: January 2019
  Advisor: Yexiang Xue.

M.S. in Computer Science, December 2018.

- University of Virginia, Charlottesville, VA, USA.
  CGPA: 3.96.
  Research Topic: Software Engineering, Information Retrieval.
  Advisor: Baishakhi Ray.

B.Sc. in Computer Science and Engineering, February 2013.

- Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.
  CGPA: 3.84 *(Ranked 6th out of 142 students in class).*
  Thesis: Future (Quantum) Computing and The Steiner Tree Problem.
  Advisor: Masud Hasan.

Publications

1. *SARTRES: A Semi-Autonomous Robot TeleopeRation Environment for Surgery.* **Md Masudur Rahman***, Mythra Varun Balakuntala Srinivasa Mur*, Mridul Agarwal, Upinder Kaur, Vishnunandan Lakshmi Venkatesh, Glebys Gonzalez, Natalia Sanchez Tamayo, Yexiang Xue, Richard Voyles, Vaneet Aggarwal, Juan Wachs. [* equal authorship], Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization Journal - AECAI2020 Special Issue , 14 Pages. (Link)

2. *From the DESK (Dexterous Surgical Skill) to the Battlefield - A Robotics Exploratory Study.* Glebys T. Gonzalez*, Upinder Kaur*, **Md Masudur Rahman***, Vishnunandan Venkatesh, Natalia Sanchez, Gregory Hager, Yexiang Xue, Richard Voyles, Juan Wachs. [* equal authorship], MHSRS Journal (Military Medicine) 2020, 23 Pages

3. *ASTRO: A Semi-Autonomous Telemedicine Robot for Operative Surgery.* Glebys Gonzalez, **Md Masudur Rahman**, Mridul Agarwal, Mythra Balakuntala, Vishnu Venkatesh, Vaneet Aggarwal, Yexiang Xue, Richard Voyles, Gregory Hager, MAJ Andrew W Kirkpatrick, MAJ Steve Overholser, Juan Wachs. Abstract Paper at MHSRS 2020. 3 pages.

4. *Transferring Dexterous Surgical Skill Knowledge between Robots for Semi-autonomous Teleoperation.* **Md M. Rahman***, N. Sanchez-Tamayo*, G. Gonzalez, M. Agarwal, V. Aggarwal, R. M. Voyles, Y. Xue, and J. Wachs [* equal authorship]. 2019. Ro-Man 2019, 6 pages. [PDF]

5. *DESK: A Robotic Activity Dataset for Dexterous Surgical Skills Transfer to Medical Robots.* N. Madapana*, **Md M. Rahman***, N. Sanchez-Tamayo*, M. V. Balakuntala, G. Gonzalez, J. P. Bindu, L. N. V. Venkatesh, X. Zhang, J. B. Noguera, T. Low, R. Voyles, Y. Xue, J. Wachs. [* equal authorship]. 2019. IROS 2019, 8 pages. [PDF]

6. *Toward Optimal Selection of Information Retrieval Models for Software Engineering Tasks.* **Md Masudur Rahman**, Saikat Chakraborty, Gail Kaiser, and Baishakhi Ray. SCAM 2019, 12 pages. [PDF]

7. *Recommending GitHub Projects for Developer Onboarding.* Chao Liu, Dan Yang, Xiaohong Zhang, Baishakhi Ray, **Md Masudur Rahman**. IEEE Access Journal 2018, 13 pages. [PDF]

8. *A Case Study on the Impact of Similarity Measure on Information Retrieval based Software Engineering Tasks.* **Md Masudur Rahman**, Saikat Chakraborty, Gail Kaiser, Baishakhi Ray. Technical Report 2018, 22 pages. [PDF]

9. *Evaluating How Developers Use General-Purpose Web-Search for Code Retrieval.* **Md M. Rahman**, J. Barson, S.y Paul, J. Kayan, F. A. Lois, S. F. Quezada, C. Parnin, K. T. Stolee, B. Ray. MSR 2018, 11 pages, 2018. [PDF] [arXiv] [Slides] [Code]

10. *Which Similarity Metric to Use for Software Documents? A study on Information Retrieval based Software Engineering Tasks.* **Md M. Rahman**, S. Chakraborty, B. Ray. ICSE '18 Companion, 2 pages, 2018. [Poster] [Link]

11. *Topic Model based Privacy Protection in Personalized Web Search.* W. Ahmad, **Md M. Rahman**, H. Wang. SIGIR'2016, 4 pages, 2016. [PDF] [Link]

Workshop

1. *Morality in Decision-Making: A Causal Approach.* **Md M. Rahman**. Accepted for oral presentation at RLDM Workshop on Moral Decision Making (MoDeM) 2019. [MoDeM Link][RLDM Link] [Video].

2. *Finding Similar Projects in GitHub using Word2Vec and WMD.* **Md M. Rahman**. Workshop on the Naturalness of Software (NL+SE 2016) at FSE 2016. [Slides]

Preprint

1. *Transferring Skill in Reinforcement Learning to Solve Long-Horizon Task* **Md M. Rahman**, J. Wachs, and Y. Xue. 2020. Technical Report 2020.

2. *Sequential Prediction with Logic Constraints.* **Md M. Rahman**, R. M. Voyles, J. Wachs, and Y. Xue. 2019. Technical Report 2020.

Research Experience

- Research Assistant, Computer Science, Purdue University, Spring 2019 - Summer 2020
- Research Assistant, Computer Science, University of Virginia, Summer 2016 - Summer 2018

Teaching Experience

- Teaching Assistant, Computer Science, Purdue University, Fall 2020.
- Teaching Assistant, Computer Science, University of Virginia, Fall 2015 - Spring 2017, Fall 2018.
- Teaching Instructor, Department of Computer Science and Engineering, BRAC University, Spring 2013 to Summer 2015.

Awards & Honors

- Student Travel Awards: ICSE/MSR 2018, NL4SE@FSE 2016, SIGIR 2016
- Enrolled in Dean List for academic excellence in B.Sc for three academic years (2008-2013).

Selected Coursework

- Algorithm Design, Analysis, And Implementation (Ph.D.@Purdue)
- Advance Machine Learning - Causality (Ph.D.@Purdue)
- Machine Learning (M.S.@UVa)
- Information Retrieval (M.S.@UVa)
- Text Mining (M.S.@UVa)
- Design and Analysis of Algorithms (M.S.@UVa)
- Natural Language Processing (M.S.@UVa)
- Vision and Language (M.S.@UVa)