# Mohammad Atiqul Islam

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## Research Areas

**Cloud and distributed systems:** performance, scheduling and resource allocation, energy efficiency, load balancing
**Economics and computing:** market design, auction and bidding, coordination through markets
**Cyber-physical systems:** data center power and cooling, thermal aware management, carbon-water efficiency
**Security and resilience:** side-channels, power attacks, thermal attacks, handling overloads
**Privacy-preserving machine learning:** efficient federated learning, fair federated learning, self-regulating clients

## Employment

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| 2019 - current | **Assistant Professor**, Computer Science and Engineering, University of Texas at Arlington |
| 2008 - 2012 | **Specialist**, Core Network Planning, Robi Axiata Ltd., Bangladesh |

## Education

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| 2018 | **Ph.D. in Electrical and Computer Engineering**<br>University of California, Riverside |
| 2008 | **B.Sc. in Electrical and Electronics Engineering**<br>Bangladesh University of Engineering and Technology |

## Research Grants

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| 2023 - 2026 | **NSF CCF#2324915**, Amount: $300K (Lead PI)<br>Collaborative Research: DESC: Type I: A User-Interactive Approach to Water Management for Sustainable Data Centers: From Water Efficiency to Self-Sufficiency |
| 2022 - 2025 | **NSF ECCS#2152357**, Amount: $400K (PI)<br>Utilizing Conducted Electromagnetic Interference (EMI) for Low-Cost Server-Level Power Monitoring in Data Centers |
| 2021 - 2022 | **UTA Research Enhancement Program (REP)**, Amount: $10K (PI)<br>Ultra-Low-Cost Server-Level Power Monitoring in Data Centers |
| 2019 - 2022 | **UT Systems Rising STARs**, Amount: $300K (PI) |

## Professional Service

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| 2021 - present | **Program Committee Member**, HPCA'26, MICRO'25, CCS'25, S&P'25, NDSS'25, Micro'24, HiPC'24, CCS'23, CCS'22, HPCA'222, SC'22, USENIX Security'21 |
| 2018 - present | **Journal Reviewer**, TPDS, TCC, TDSC, TGCN, TSUSC, TON, TSC, ACM Computing Surveys, TOMPECS, TOSN |
| 2024 - present | **IEEE Standards Association**, Member of the Green ICT Standards Committee developing IEEE#P1959 and IEEE#P1960 |

## Outreach

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| 2022 - present | **Faculty mentor**<br>UTA LSAMP - Summer Research Academy and UTA I-Engage Mentoring Program |
| 2020 - present | **Member of Outreach and Student Recruitment Committee**<br>Computer Science and Engineering at the University of Texas at Arlington |
| 2020 - present | **Member of External and BPC Student Award Committee**<br>Computer Science and Engineering at the University of Texas at Arlington |

## ADVISING AND MENTORING

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| 2019 - present | **Student advising:** Md Rajib Hossen (PhD), Pranjol Sen Gupta (PhD), Zahidur Rahim Talukder (PhD), Tasnim Azad Abir (PhD), Mohammad Shahedur Rahman (PhD), Sahar Zargarzadeh (PhD), Imtiaz Bin Rahim (PhD), and Iftakhar Ahmad (MS) |
| 2015 - 2018 | **Student mentoring:** Zhihui Shao (PhD), Fangfang Yang (PhD), Ji Guo (MS), Christian Adrito (BS), Aaron Sanders (BS), Jerry Huang (High school) |
| 2016 and 2017 | **Judge and mentor for K-12 students**<br>Science Fair Expo at the Riverside County Office of Education |

## PUBLICATIONS

### Journals

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|---|---|
| **CACM** | P. Li, J. Yang, **M. A. Islam**, and Shaolei Ren, "Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models", in *Special Issue on Sustainability of the Communications of the ACM* (2025). |
| **TOMPECS** | Z. Talukder, B. Lu, S. Ren, and **M. A. Islam**, "Hardware-Sensitive Fairness in Heterogeneous Federated Learning", in *ACM Transactions on Modeling and Performance Evaluation of Computing Systems* (2025). |
| **POMACS** | Z. Shao, **M. A. Islam**, and Shaolei Ren, "Your Noise, My Signal: Exploiting Switching Noise for Stealthy Data Exfiltration from Desktop Computers", in *Proc. ACM Meas. Anal. Comput. Syst.* 4, 1, Article 7 (March 2020), 39 pages. https://doi.org/10.1145/3379473 |
| **TCC** | **M. A. Islam**, H. Mahmud, S. Ren, and X. Wang, "A Carbon-Aware Incentive Mechanism for Greening Colocation Data Centers", in *EEE Transactions on Cloud Computing*, vol. 8, no. 1, pp. 4-16, 1 Jan.-March 2020, doi: 10.1109/TCC.2017.2767043. (Impact factor: 4.7) |
| **POMACS** | **M. A. Islam**, L. Yang, K. Ranganath, and S. Ren, "Why Some Like It Loud: Timing Power Attacks in Multi-tenant Data Centers Using an Acoustic Side Channel", in *Proc. ACM Meas. Anal. Comput. Syst.* 2, 1, Article 6 (March 2018), 33 pages. https://doi.org/10.1145/3179409 |
| **TCC** | **M. A. Islam**, K. Ahmed, H. Xu, N. Tran, G. Quan, and S. Ren, "Exploiting Spatio-Temporal Diversity for Water Saving in Geo-Distributed Data Centers", in *IEEE Transactions on Cloud Computing*, vol. 6, no. 3, pp. 734-746, 1 July-Sept. 2018. (Impact factor: 5.97) |
| **TWC** | M. N. H. Nguyen, N. H. Tran, **M. A. Islam**, C. Pham, S. Ren, and C. S. Hong, "Fair Sharing of Backup Power Supply in Multi-Operator Wireless Cellular Towers", in *IEEE Transactions on Wireless Communications*, 2017. (Impact factor: 6.39) |
| **TCC** | **M. A. Islam**, S. Ren, G. Quan, M. Shakir, and A. Vasilakos, "Water-Constrained Geographic Load Balancing in Data Centers", in *IEEE Transactions on Cloud Computing*, vol. 5, no. 2, pp. 208-220, April-June 1 2017. (Impact factor: 5.97) |
| **TSC** | **M. A. Islam**, S. Ren, A. H. Mahmud and G. Quan, "Online Energy Budgeting for Cost Minimization in Virtualized Data Center", in *IEEE Transactions on Services Computing*, vol. 9, no. 3, pp. 421-432, May-June 1 2016. (Impact factor: 5.7) |
| **SUSCOM** | **M. A. Islam**, S. Ren, N. Pissinou, A. H. Mahmud, and A. V. Vasilakos, "Distributed Temperature-aware Resource Management in Virtualized Data Center", *Sustainable Computing: Informatics and Systems*, vol. 6, pp. 3-16, June 2015. (Impact factor: 1.2) |
| **TSP** | S. Ren, N. Deligiannis, Y. Andreopoulos, **M. A. Islam**, and M. van der Schaar, "Dynamic Scheduling for Energy Minimization in Delay-Sensitive Stream Mining", in *IEEE Transactions on Signal Processing*, vol. 62, no. 20, pp. 5439-5448, Oct. 15, 2014. (Impact factor: 5.23) |

### Conferences

| | |
|---|---|
| **IWCMC'25** | M. Guizani, L. U. Khan, **M. A. Islam**, and W. Ullah "Resource Optimized Split Federated Learning: A Reinforcement Learning and Optimization Approach", *The 21st International Wireless Communications & Mobile Computing Conference (IWCMC)*, 2025. **Best Paper Award** |

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| **IWCMC'25** | M. Guizani, L. U. Khan, and **M. A. Islam** "Quality of Experience Enhancement in Wireless Metaverse: A Resource Optimization Scheme", *The 21st International Wireless Communications & Mobile Computing Conference (IWCMC)*, 2025. |
| **IEEE EDGE'25** | Z. Talukder, M. Rana, K. Hamm, and **M. A. Islam** "Empowering Clients: Self-Adaptive Federated Learning for Data Quality Challenges", *IEEE International Conference on Edge Computing & Communications (IEEE EDGE)*, 2025. |
| **MobiSys'25** | T. A. Abir, V. Le, E. Kuantama, P. S. Gupta, A. Copely, J. Dawes, **M. A. Islam**, R. Han, and P. Nguyen, and D. Milroy, "Detection and Tracking of Drone Swarms using LiDAR", *The 23rd Annual International Conference on Mobile Systems, Applications and Services (MobiSys)*, 2025. |
| **HiPC'24** | A. Hossain, A. Badawy, **M. A. Islam**, T. Patki, and K. Ahmed, "HPC Application Parameter Autotuning on Edge Devices: A Bandit Learning Approach", *he 31st International Conference on High Performance Computing, Data, and Analytics (HiPC)*, 2024. |
| **CLUSTER'24** | M. Hossen, V. Sochat, A. Sarkar, **M. A. Islam**, and D. Milroy, "Enabling Workload-Driven Elasticity in MPI-based Ensembles", *IEEE International Conference on Cluster Computing (CLUSTER)*, 2024. |
| **E-Energy'24** | P. Gupta, M. Hossen, P. Li, S. Ren, and **M. A. Islam** "A Dataset for Research on Water Sustainability", *ACM International Conference on Future and Sustainable Energy Systems (e-Energy)*, 2024. **Best Notes Paper Award** |
| **E-Energy'24** | P. Gupta, S. Alam, Y. Zhang, and **M. A. Islam** "Towards Non-Intrusive Real-Time Monitoring of Behind the Meter Residential Distributed Energy Resources", *ACM International Conference on Future and Sustainable Energy Systems (e-Energy)*, 2024. |
| **ISVLSI'24** | **M. A. Islam**, "Water-Wise Computing: Addressing Data Center Water Consumption for a Sustainable Future", *IEEE Computer Society Annual Symposium on VLSI ISVLSI*, 2024 (Abstract). |
| **SenSys'23** | P. Gupta, Z. Talukder, T. Abir, P. Nguyen, and **M. A. Islam** "Enabling Low-Cost Server Level Power Monitoring in Data Centers Using Conducted EMI", *ACM Conference on Embedded Networked Sensor Systems*, 2023. |
| **IEEE EDGE'23** | P. Agbaje, A. Anjum, Z. Talukder, **M. A. Islam**, E. Nwafor, and H. Olufowobi "FedCime: An Efficient Federated Learning Approach For Clients in Mobile Edge Computing", *IEEE International Conference on Edge Computing & Communications*, 2023. |
| **HPCA'23** | M. Hossen, K. Ahmed, and **M. A. Islam** "Market Mechanism-Based User-in-the-Loop Scalable Power Oversubscription for HPC Systems", *IEEE Intl. Symp. on High Performance Computer Architecture*, 2023. |
| **IEEE EDGE'22** | Z. Talukder and **M. A. Islam** "Computationally Efficient Auto-Weighted Aggregation for Heterogeneous Federated Learning", *IEEE International Conference on Edge Computing & Communications*, 2022. |
| **HPDC'22** | M. Hossen, **M. A. Islam**, and K. Ahmed, "Practical Efficient Microservice Autoscaling with QoS Assurance", *ACM International Symposium on High-Performance Parallel and Distributed Computing*, 2022. |
| **SenSys'22** | P. Gupta, Z. Talukder, **M. A. Islam**, and P. Nguyen "Towards Server-Level Power Monitoring in Data Centers Using Single-Point Voltage Measurement", *ACM Conference on Embedded Networked Sensor Systems*, 2022 (Poster). |
| **SIGMETRICS'22** | M. Hossen and **M. A. Islam** "Practical Efficient Microservice Autoscaling", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2022 (Poster). |
| **SIGMETRICS'22** | Z. Talukder and **M. A. Islam** "Efficient Federated Learning with Self-Regulating Clients", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2022 (Poster). |
| **CLOUD COMPUTING'22** | M. Hossen and **M. A. Islam**, "Towards Efficient Microservices Management Through Opportunistic Resource Reduction", *The Thirteenth International Conference on Cloud Computing, GRIDs, and Virtualization (CLOUD COMPUTING)*, 2022 (Short paper). |

**CNS'21** F. Yang, **M. A. Islam**, and S. Ren, "CompKey: Exploiting Computer's Electromagnetic Radiation for Secret Key Generation", *IEEE Conference on Communications and Network Security (CNS)*, 2021.

**HPCA'21** Z. Shao, **M. A. Islam**, and S. Ren, "Heat Behind the Meter: A Hidden Threat of Thermal Attacks in Edge Colocation Data Centers", *IEEE Intl. Symp. on High Performance Computer Architecture*, 2021.

**SIGMETRICS'20** Z. Shao, **M. A. Islam**, and S. Ren, "Your Noise, My Signal: Exploiting Switching Noise for Stealthy Data Exfiltration from Desktop Computers", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2020.

**CLOUD'20** Z. Shao, **M. A. Islam**, and S. Ren, "DeepPM: Efficient Power Management in Edge Data Centers using Energy Storage", *IEEE CLOUD*, 2020.

**NSS'20** F. Yang, **M. A. Islam**, and S. Ren, "PowerKey: Generating Secret Keys from Power Line Electromagnetic Interferences", *International Conference on Network and System Security*, 2020.

**SIGMETRICS'19** Z. Shao, **M. A. Islam**, and S. Ren, "A First Look at Thermal Attacks in Multi-Tenant Data Centers.", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2020. (work in progress paper)

**CCS'18** **M. A. Islam** and S. Ren, "Ohm's Law in Data Centers: A Voltage Side Channel for Timing Power Attacks", *ACM Conference on Computer and Communications Security*, 2018.

**SIGMETRICS'18** **M. A. Islam**, L. Yang, K. Ranganath, and S. Ren, "Why Some Like It Loud: Timing Power Attacks in Multi-Tenant Data Centers Using an Acoustic Side Channel", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2018.

**HPCA'18** **M. A. Islam**, X. Ren, S. Ren, and A. Wierman, "A Spot Capacity Market to Increase Power Infrastructure Utilization in Multi-Tenant Data Centers", *IEEE Intl. Symp. on High Performance Computer Architecture*, 2018.

**NOMS'18** M. N. H. Nguyen, N. H. Tran, **M. A. Islam**, C. Pham, S. Ren and C. S. Hong, "Multi-operator backup power sharing in wireless base stations", *IEEE/IFIP Network Operations and Management Symposium*, 2018.

**CCS'17** **M. A. Islam**, S. Ren, and A. Wierman, "Exploiting a Thermal Side Channel for Power Attacks in Multi-Tenant Data Centers", *ACM Conference on Computer and Communications Security*, 2017.

**SIGMETRICS'17** **M. A. Islam**, X. Ren, S. Ren, and A. Wierman, "A Spot Capacity Market to Increase Power Infrastructure Utilization in Multi-enant Data Centers", *ACM International Conference on Measurement and Modeling of Computer Systems*, 2017. (extended summary of HPCA'18)

**HPCA'16** **M. A. Islam**, X. Ren, S. Ren, A. Wierman, and X. Wang, "A Market Approach for Handling Power Emergencies in Multi-Tenant Data Center", *IEEE Intl. Symp. on High Performance Computer Architecture*, 2016.

**IGSC'16** **M. A. Islam**, A. Gandhi, and S. Ren, "Minimizing Electricity Cost for Geo-Distributed Interactive Services with Tail Latency Constraint", *Intl. Green and Sustainable Computing Conference*, 2016.

**IGSC'16** T. Wei, **M. A. Islam**, S. Ren, and Q. Zhu, "Co-Scheduling of Datacenter and HVAC Loads in Mixed-Use Buildings", *Intl. Green and Sustainable Computing Conference*, 2016.

**HPCA'15** **M. A. Islam**, H. Mahmud, S. Ren, and X. Wang, "Paying to Save: Reducing Cost of Colocation Data Center via Rewards", *IEEE Intl. Symp. on High Performance Computer Architecture*, 2015.

**ICCAD'15** K. Ahmed, **M. A. Islam**, and S. Ren, "A Contract Design Approach for Colocation Data Center Demand Response", *Intl. Conference on Computer Aided Design*, 2015.

**ICAC'14** S. Ren and **M. A. Islam**, "Colocation Demand Response: Why Do I Turn Off. My Servers?", *USENIX Intl. Conf. on Autonomic Computing*, 2014.

**ICAC'14** **M. A. Islam**, K. Ahmed, S. Ren, and G. Quan, "Exploiting Temporal Diversity of Water Efficiency to Make Data Center Less Thirsty", *USENIX Intl. Conf. on Autonomic Computing*, 2014.

**IGCC'14** **M. A. Islam**, S. Ren, and X. Wang, "GreenColo: A Novel Incentive Mechanism for Minimizing Carbon Footprint in Colocation Data Center", *Intl. Green Computing Conference*, 2014.

**MASCOTS'13** **M. A. Islam**, S. Ren, and G. Quan, "Online Energy Budgeting for Virtualized Data Centers", *IEEE Intl. Symp. on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, 2013.

**IGCC'13** **M. A. Islam**, S. Ren, N. Pissinou, H. Mahmud, and A. V. Vasilakos, "Distributed Resource Management in Data Center with Temperature Constraint", *Intl. Green Computing Conf.*, 2013.

## Workshops

**JSSPP'25** A. Hossain, A. Abdurahman, **M. A. Islam**, and K. Ahmed, "Power-Aware Scheduling for Multi-Center HPC Electricity Cost Optimization", *28th Workshop on Job Scheduling Strategies for Parallel Processing (JSSPP) (collocated with IPDPS)*, 2020.

**WAIN'20** Md Rajib Hossen and **M. A. Islam**, "Mobile Task Offloading Under Unreliable Edge Performance", *Workshop on AI in Networks and Distributed Systems (collocated with IFIP Performance'20)*, 2020.

**Greenmetrics'17** **M. A. Islam**, S. Ren, and A. Wierman, "A First Look at Power Attacks in Multi-Tenant Data Centers", *ACM Greenmetrics (collocated with SIGMETRICS'17)*, 2017. (extended abstract of CCS'17)

**CoolDC'16** **M. A. Islam** and S. Ren, "A New Perspective on Energy Accounting in Multi-Tenant Data Centers", *USENIX Workshop on Cool Topics on Sustainable Data Centers (collocated with NSDI'16)*, 2016.

**HotPower'14** K. Ahmed, **M. A. Islam**, S. Ren, and G. Quan, "Can data center become water self-sufficient?", *In Proceedings of the 6th USENIX conference on Power-Aware Computing and Systems*, 2014.

**Greenmetrics'14** S. Ren and **M. A. Islam**, "A First Look at Colocation Demand Response", *ACM Greenmetrics (co-located with SIGMETRICS)*, 2014. (extended summary of ICAC'14)