ZAHIDUR TALUKDER

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OBJECTIVE

My research is focused on the theoretical, empirical, and security aspects of algorithms and machine learning. I have been working on the efficient data and client handling of federated learning. I have developed self-regulating clients who can handle data-level errors and new aggregation techniques for servers in federated learning. I am highly passionate about applications involved with machine learning and algorithms.

EDUCATION

PhD Candidate, Computer Science, The University of Texas at Arlington, GPA: 4.00/4.00 — Sep 2019 - Aug 2024
Research Interests: Machine Learning, Privacy & Security, Algorithm

EXPERIENCE

Graduate Research Assistant — *Sep 2019 - Present*
Rigourous Design Lab, The University of Texas at Arlington
- Dived deep to identify the quality of data for federated learning and delivered an efficient aggregation algorithm to handle data quality.
- Enabling clients to take decisions regarding participation in federated learning training rounds to save both clients' local computation and communication costs.

Graduate Teaching Assistant — *Sep 2019 - Present*
The University of Texas at Arlington
- Taught both graduate and undergraduate level courses like algorithms, data structure, computer architecture, etc.

TECHNICAL SKILLS

- **Languages:** Python, Matlab, C
- **Tools:** Tensorflow, Keras, Matlab, Scikit-Learn, Pandas, Numpy, Linux, Git
- **Expertise:** Machine Learning, Federated Learning, Deep Learning, Statistics, Data Science, Algorithm, Security

PROJECTS

Fair Federated Learning with Heterogeneous Devices — *Aug 2022 - Present*
Proposed algorithms ensure fairness for heterogeneous devices with respect to model architecture for federated learning.

Self Regulating clients for Federated Learning — *Jan 2022 - Present*
The designed algorithm enables self-regulating clients who can actively take decisions regarding participation in federated learning to save both local computation and communication costs.
Publications: SIGMETRICS 2022

Auto-Weighted Aggregation for Heterogeneous Federated Learning — *Jan 2021 - May 2022*
The proposed lightweight auto weighted aggregation techniques can handle the heterogeneity of federated learning by minimizing the weight of unfavorable model updates.
Publications: IEEE EDGE 2022

Server-Level Power Monitoring in Data Centers Using Single-Point Voltage Measurement — *Sep 2019 - Present*
The proposed low-cost novel power monitoring approach that uses only one sensor to extract power consumption information of all servers by utilizing the conducted electromagnetic interference of server power supplies.
Publications: SENSYS 2022

SELECTED PUBLICATIONS

- "Self Regulating clients for Federated Learning "
  Zahidur Talukder, Mohammad A. Islam (In-Submission)
- "Computationally Efficient Auto-Weighted Aggregation for Heterogeneous Federated Learning"
  Zahidur Talukder, Mohammad A. Islam (IEEE EDGE 2022)
- "FedSRC: Efficient Federated Learning with Self-Regulating Clients" (Poster)
  Zahidur Talukder, Mohammad A. Islam (SIGMETRICS 2022)
- "Towards Server-Level Power Monitoring in Data Centers Using Single-Point Voltage Measurement" (Poster)
  Pranjol Gupta, **Zahidur Talukder**, Mohammad A. Islam (SENSYS 2022)

AWARDS

- **Best Poster Award Honorable Mention** - SCRF@UTA 2022
- **Secondary and Higher Secondary Board Merit Scholarship** - Bangladesh Education Board (top 0.1%)

VOLUNTEER EXPERIENCE

- Culture Secretary of Bangladesh Student Organization (BSO) in 2021
- Reviewer in The 4th Workshop on Online Abuse and Harms (WOAH) in 2020