

RESEARCH INTERESTS

Data Visualization, Parallel & Distributed Computing, High Performance Computing, Data Management

RESEARCH PROJECTS

Dec 2023 - Present **ESeMan**, an Event Sequence MANager for interactive visual analysis of events with tunable accuracy

- ◇ Developed a data management system to address the challenge of balancing interactive performance and visual accuracy in visualizing large number of events.
- ◇ Built interfacing to generate event summaries with varying visual accuracy.
- ◇ Achieved sub-100ms interactive response time while maintaining pixel-perfect visual accuracy.
- ◇ Published the results of this project as a full paper at IEEE Lдав 2025 workshop.

Aug 2019 - Present **Traveler**, an integrated multi-view visualization platform for analyzing parallel program traces

- ◇ Developed a visualization system to analyze trace data collected from a distributed array toolkit running a C++ runtime system.
- ◇ Designed web-based interactive node-link diagram, scalable time-series charts, and RESTful API backend.
- ◇ Enable faster navigation on large traces and easier identification of performance bottlenecks through interactive visualizations.
- ◇ Published a full paper (IEEE VIS 2022), a short paper (IEEE VIS 2024), and three workshop papers based on the results of this project.

Jun 2024 - Present **PerfAnalyzer**, a web-based dashboard to correlate performance changes to source code modifications

- ◇ Developed a web-based dashboard, using Plotly and DASH, to correlate scientific software performance changes with source code modifications.
- ◇ Built an interfacing with MySQL database that enabled a flexible performance data storage with user-friendly query interface.
- ◇ Facilitated automated performance data collection from multiple Git commits with different input configurations.
- ◇ Submitted a short paper at the PMBS 2025 workshop highlighting the benefits of integrating Git metadata in the performance analysis workflow.

Jun 2022 - Aug 2023 **AutoProfiler**, a scripting tool for performance profiling of supercomputing applications

- ◇ Automated the overall performance analysis pipeline of the **ExaGO**, a collection of software packages for solving power grid optimization problems.
- ◇ Enabled multi-platform (CPU, GPU) profiling by easy integration with TAU, HPCToolkit, and Nvidia Nsight.
- ◇ Enabled easy configuration of different profiling setups and software versions leveraging the Spack package manager.
- ◇ Designed scripts to estimate the strong and weak scaling measurements of ExaGO on different Supercomputing platforms.
- ◇ Presented a poster on the impacts of this project at the ECP23 annual meeting.

PROFESSIONAL EXPERIENCE

Aug 2022 - Present **Graduate Research Assistant**
University of Utah, Salt Lake City, UT, USA

Jan 2024 - May 2024 **Graduate Teaching Assistant (Introduction to Data Science)**
University of Utah, Salt Lake City, UT, USA

Aug 2019 - May 2022 **Graduate Research Assistant**
University of Arizona, Tucson, AZ, USA

Jan 2016 - Jun 2019 **Software Engineer**
Structured Data Systems Limited, Dhaka, Bangladesh

INTERNSHIPS

- Jun 2024 - Dec 2024 **Graduate Student Intern**
Los Alamos National Laboratory, Los Alamos, NM, USA
- Jun 2023 - Aug 2023 **PhD Intern**
Pacific Northwest National Laboratory, Remote (Richland, WA, USA)
- Jun 2022 - Aug 2022 **Visiting Graduate Student**
Argonne National Laboratory, Remote (Lemont, IL, USA)

EDUCATION

- Aug 2022 - Present **Ph.D.** in Computing, GPA: 4.00/4.00
Expected Fall 2025 School of Computing, University of Utah, USA
Thesis: Event Sequence Visualization: Design Considerations and Data Management Techniques
Advisor: [Katherine E. Isaacs](#)
- Jan 2014 - May 2016 **Master of Science** in Computer Science & Engineering, GPA: 3.65/4.00
Department of Computer Science & Engineering, University of Dhaka, Bangladesh
Thesis: Game Theoretic Downlink Resource Scheduling in Self-coexisting Cognitive Radio Networks
Advisor: [Md. Abdur Razzaque](#)
- Jan 2009 - Aug 2013 **Bachelor of Science** in Computer Science & Engineering, GPA: 3.63/4.00
Department of Computer Science & Engineering, University of Dhaka, Bangladesh
Thesis: A Distributed Algorithm for Generating Prime Numbers using MapReduce
Advisor: [Syed Faisal Hasan](#)

RESEARCH PUBLICATIONS

- 2025 **Managing Data for Scalable and Interactive Event Sequence Visualization (Read ↗)**
The 15th IEEE Workshop on Large Data Analysis and Visualization (LDAV)
Sayef Azad Sakin, Katherine E. Isaacs
- 2024 **A Literature-based Visualization Task Taxonomy for Gantt Charts (Read ↗)**
IEEE Visualization and Visual Analytics (VIS)
Sayef Azad Sakin, Katherine E. Isaacs
- 2022 **Traveler: Navigating Task Parallel Traces for Performance Analysis (Read ↗)**
IEEE Visualization and Visual Analytics (VIS)
Sayef Azad Sakin, Alex Bigelow, R Tohid, Connor Scully-Allison, Carlos Scheidegger, Steven R Brandt, Christopher Taylor, Kevin A Huck, Hartmut Kaiser, Katherine E Isaacs
- 2022 **Halide Code Generation Framework in Phylanx (Read ↗)**
Euro-Par 2022: Parallel Processing Workshops
R Tohid, Shahrzad Shirzad, Christopher Taylor, **Sayef Azad Sakin**, Katherine E Isaacs, Hartmut Kaiser
- 2020 **Distributed Asynchronous Array Computing with the JetLag Environment (Read ↗)**
IEEE/ACM 9th Workshop on Python for High-Performance and Scientific Computing (PyHPC)
Steven R Brandt, Bit Hasheminezhad, Nanmiao Wu, **Sayef Azad Sakin**, Alex R Bigelow, Katherine E Isaacs, Kevin Huck, Hartmut Kaiser
- 2020 **Jetlag: An interactive, asynchronous array computing environment (Read ↗)**
Practice and Experience in Advanced Research Computing (PEARC)
Steven R Brandt, Alex Bigelow, **Sayef Azad Sakin**, Katy Williams, Katherine E Isaacs, Kevin Huck, Rod Tohid, Bibek Wagle, Shahrzad Shirzad, Hartmut Kaiser
- 2017 **Self-coexistence among IEEE 802.22 networks: Distributed allocation of power and channel (Read ↗)**
Sensors Journal, MDPI
Sayef Azad Sakin, Md Abdur Razzaque, Mohammad Mehedi Hassan, Atif Alamri, Nguyen H Tran, Giancarlo Fortino

TECHNICAL SKILLS

(Left to Right - Highest to Lowest Proficiency)

Programming Languages: Python, C, C++, BASH, SQL, Javascript, Java, Objective C

Data Analysis Packages: NumPy, Pandas, CGAL, SciPy, scikit-learn, MATLAB

Visualization Tools: D3.js, Plotly, Dash, Matplotlib, Seaborn, ggplot2

VOLUNTEERING

- Nov 2024 **Lead Student Volunteer**
The Supercomputing Conference, Atlanta, GA, USA
Digital Experience, Reproducibility, and HPC Immersion committees
- Nov 2023 **Lead Student Volunteer**
The Supercomputing Conference, Denver, CO, USA
Tutorials Committee, Acting Judge for SciViz Showcase
- Nov 2022 **Student Volunteer**
The Supercomputing Conference, Dallas, TX, USA
Room monitoring, Session chair and presenter assistance
- Oct 2022 **Student Volunteer**
IEEE VIS: Visualization & Visual Analytics, Oklahoma City, OK, USA
Room monitoring, Session chair and presenter assistance, and Help desk
- Nov 2021 **Student Volunteer**
The Supercomputing Conference, St. Louis, MO, USA (Virtual)
Remote session chair and presenter assistance, Monitoring online platforms