

# Kazi Shahrukh Omar

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## EDUCATION

### University of Illinois Chicago (UIC)

Doctor of Philosophy, Computer Science, GPA(Current): 4.00/4.00

Advised by [Prof. Fabio Miranda](#)

Chicago, IL

Aug 2021 - May 2026 (Expected)

### Military Institute of Science and Technology (MIST)

Bachelor of Science, Computer Science and Engineering (CSE), GPA: 3.71/4.00

Dhaka, Bangladesh

Feb 2015 - Aug 2019

## WORK EXPERIENCE

### Electronic Visualization Laboratory (EVL), University of Illinois Chicago (UIC)

Research Assistant (Advisor: [Prof. Fabio Miranda](#))

Chicago, IL

Aug 2021 - Present

- Research on visualization & visual analytics, big data analysis, and applied machine learning.
- Developing visual analytics systems for urban and healthcare domains.
- Client requirement gathering, prototyping and design, development, evaluation.

### Department of Computer Science, University of Illinois Chicago (UIC)

Teaching Assistant

Chicago, IL

Jan 2022 - Present

- CS 422: User Interface Design and Programming [Instructor: Prof. Andruid Kerne].
- CS 424: Visualization and Visual Analytics [Instructor: Prof. Fabio Miranda].
- CS 425: Computer Graphics [Instructor: Prof. Fabio Miranda].

### Department of Computer Science, Uttara University

Lecturer

Dhaka, Bangladesh

Jul 2019 – Jun 2021

- Courses Taught: Discrete Mathematics - Computer Peripheral, Interfacing and Maintenance - Digital Logic Design - Computer Graphics - Object Oriented Programming - Design and Analysis of Algorithms - Data Structures

### Solution Arts Ltd

Software Development Intern

Dhaka, Bangladesh

Nov 2017 - Dec 2017

- Designed database schema for a hotel management system.
- Frontend development of the system.

## TECHNICAL SKILLS

- **Programming Languages**: Python, C/C++, JavaScript, TypeScript, Java, R, MATLAB, Shell Scripting, Cython.
- **Web**: React, Angular, Flask, HTML, CSS, Bootstrap.
- **Mobile App Development**: React Native, Android Studio.
- **Data Visualization**: d3.js, three.js, Vega-lite, WebGL, Matplotlib, Seaborn, Plotly, Shiny.
- **Data Processing**: NumPy, Pandas, Dask, SciPy.
- **Geodata Processing**: Geopandas, Osmium, Overpass, PlotOptiX, Pyrosm, Shapely, Spatialpandas, Rasterio.
- **Machine Learning**: scikit-learn, TensorFlow, Keras, PyTorch, nltk.
- **Other Skills**: Version control - Git, Latex/Overleaf.

## PUBLICATIONS

K.S. Omar, S. Wang, R. Kungummaraju, T. Bhatt and F. Miranda, "VIGMA: The Visual Gait and Motion Analytics Framework", *IEEE Transactions on Visualization and Computer Graphics*, 2024. [[Under Review](#)]

S. Wang, K.S. Omar, F. Miranda and T. Bhatt, "Automatic gait event detection in older adults during perturbed walking", *Journal of NeuroEngineering and Rehabilitation*, 2024. [[Under Review](#)]

K.S. Omar, G. Moreira, D. Hodczak, M. Hosseini, M. Lage and F. Miranda, "Deep Umbra: A Global-Scale Conditional Generative Adversarial Approach for Sunlight Access and Shadow Accumulation in Urban Spaces", *IEEE Transactions on Big Data*, 2024. [[pdf](#)]

**K.S. Omar**, G Moreira, D Hodczak, M Hosseini and F Miranda, "Crowdsourcing and Sidewalk Data: A Preliminary Study on the Trustworthiness of OpenStreetMap Data in the US", *ASSETS'22 UrbanAccess Workshop*, 2022. [\[pdf\]](#)

**K.S. Omar**, M.N. Islam, and N.S. Khan, "Exploring Tree-Based Machine Learning Methods to Predict Autism Spectrum Disorder", *Neural Engineering Techniques for Autism Spectrum Disorder*, vol (1), pp 165–183. Academic Press, 2021.

**K.S. Omar**, A. Anjum, T. Oannahary, R.K. Rizvi, D. Shahrin, T.T. Anannya, S.N. Tumpa, M.M. Karim, M.N. Islam and F. Rabbi, "An Intelligent Assistive Tool for Alzheimer's Patient", *The 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT)*, 2019. [\[pdf\]](#)

**K.S. Omar**, P. Mondal, N.S. Khan, M.R.K. Rizvi, M.N. Islam, "A machine learning approach to predict autism spectrum disorder", *International Conference on Electrical, Computer and Communication Engineering (ECCE)*, 2019. [\[pdf\]](#)

## PROJECTS

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**Decision Support Tools for Sustainable Urban Planning & Public Health** Aug 2024 - Present

Graduate Research Project, UIC

- Developing a visualization tool for urban planning, transportation, and public health.
- Designing a flexible framework adaptable to diverse scenarios.

**Visual Gait and Motion Analysis**

Jan 2023 - Jul 2024

Graduate Research Project, UIC

- Developed VIGMA, an open-access visual analytics system for gait and motion analysis.
- Validated analytical tool through usage scenarios performed with experts.

**Bi-GRU Model for Automatic Gait Event Detection**

Jul 2023 - Jun 2024

Graduate Research Project, UIC

- Developed a Bi-GRU model for automatic gait event detection using marker, angle, and GRF data.
- Illustrated kinematic methods are more effective than traditional GRF based methods.

**Navigating Large Dining Hall Spaces Considering Dietary Restrictions**

Aug 2023 - Dec 2023

HCI Class Group Project, UIC

- Built a React Native app for students with dietary restrictions at UIC.
- Received positive feedback from user testing and developed further improvements.

**Generative Model for Global Sunlight Access and Shadows**

May 2022 - Aug 2023

Graduate Research Project, UIC

- Developed Deep Umbra, a generative adversarial network to quantify shadows.
- A method 6x faster compared to the state-of-the-art shadow computation techniques.
- A dataset for 100+ cities, showing the model's low RMSE across urban contexts.

**Trustworthiness of OpenStreetMap (OSM) Sidewalk Data in US**

Jul 2022 - Sep 2022

Graduate Research Project, UIC

- Conducted a preliminary study on the availability and trustworthiness of sidewalk data in US cities.
- Developed a trustworthiness index using historical OSM data.

**COVID-19 Impact Analysis in Chicago Neighborhoods**

Jan 2022 - May 2022

Data Science Class Group Project, UIC

- Modeled COVID-19 impact in Chicago neighborhoods using socioeconomic data.
- Built a Random Forest model predicting COVID-19 death rates.
- Training error rate of 0.29 and a test error rate of 0.78 deaths per thousand people.

**Chicago Taxi Ridership Visualization Tool**

Jan 2022 - May 2022

Visual Analytics Class Group Project, UIC

- Developed a tool to visualize 2019 Chicago taxi ridership trends.
- Optimized for large screens at UIC's EVL lab.
- Filtering options by area, taxi company, and time, revealing ridership patterns.

**Mobility-Flow Query Approximation using NeuralCubes**

Aug 2021 - Dec 2021

Graduate Research Project, UIC

- Developed in-memory model to accurately approximate mobility-flow queries.
- Achieved under 2% error in approximation with a minimal memory footprint of 114 KB.

### Autism Spectrum Disorder Prediction Model and Mobile Application

Mar 2018 - Feb 2019

Bachelor's Thesis, MIST

- Developed a novel random forest model to classify autism traits across all ages.
- Achieved 92%+ accuracy with the AQ-10 dataset and developed a mobile app.
- Evaluated the model on both AQ-10 and real-world datasets.

### IoT-based Assistive Tool for Alzheimer's Patients

Feb 2018 - July 2018

Bachelor's Research Project, MIST

- Proposed an assistive tool and mobile app for Alzheimer's patients and caregivers.
- Supports health monitoring, medication reminders, item tracking, and location monitoring.
- Conducted a study with 15 participants, showing the system's effectiveness and usability.

## TALKS & PRESENTATIONS

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|--|----------|
| • <b>Visual Analytics Approaches for Facilitating Explainability of Graph Neural Network,</b><br>Ph.D. Qualifier Exam.   | Feb 2023 |
| • <b>Crowdsourcing and Sidewalk Data: A Preliminary Study on the Trustworthiness of OpenStreetMap Data in the US,</b><br>Paper presented at ASSETS'22 Workshop on The Future of Urban Accessibility. | Sep 2022 |
| • <b>An Intelligent Assistive Tool for Alzheimer's Patient,</b><br>Paper presented at IEEE ICASERT (2019) conference.  | May 2019 |
| • <b>A Machine Learning Approach to Predict Autism Spectrum Disorder,</b><br>Paper presented at IEEE ECCE (2019) conference.   | Feb 2019 |

## SERVICES

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| • Paper reviewer for PacificVis 2024, EuroVis 2023-2024, IEEE VIS 2022-2024. | 2022, 2023, 2024 |
| • Volunteer for CAVE3 demos hosted by EVL, UIC.                              | 2023, 2024       |
| • Vice President of Media of Bangladeshi Student Association at UIC.         | 2022 - 2023      |
| • IEEE VIS Satellite Event volunteer. Held at EVL, UIC.                      | 2021             |
| • Class Representative, Department of CSE at MIST.                           | 2018             |

## HONORS AND AWARDS

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| • Merit Scholarship for academic performance, Military Institute of Science and Technology | 2018       |
| • Dean's List (two consecutive years), Military Institute of Science and Technology        | 2016, 2017 |