

Sanjana Srabanti

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Professional Summary

A driven researcher with a Ph.D. in Computer Science specializing in **Human-Centered Data Science** and **Data Visualization**, with **7+ years** of experience building end-to-end data-driven systems for large, complex, heterogeneous, and multivariate scientific datasets. Experienced in developing reproducible data pipelines, analytical workflows, machine learning-assisted systems, and interactive visual analytics tools that transform complex data into interpretable, actionable insights. Brings hands-on experience with Python, data processing, statistical analysis, machine learning workflows, and LLM/agent AI-assisted interfaces, with a strong emphasis on reliability, interpretability, workflow automation, and interdisciplinary collaboration with domain scientists and engineers.

Education

Ph.D. in Computer Science

July 2026

University of Illinois, Chicago, USA

Advisors: [G. Elisabeta Marai](#) and [Fabio Miranda](#)

MS in Computer Science

Dec 2024

University of Illinois, Chicago, USA

B.Sc in Computer Science and Engineering

Jan 2014 – Jan 2018

Military Institute of Science and Technology, Dhaka, Bangladesh

Research Experience

Electronic Visualization Laboratory, University of Illinois at Chicago

Chicago, IL

Research Assistant

Aug 2019 – Present

• Dysphagia Risk Stratification in Head and Neck Cancer

Jan 2026 – Present

- Led development of a two-stage machine learning framework combining XGBoost with ElasticNet logistic regression to identify patients at risk for moderate-to-severe swallowing impairment.
- Built leakage-resistant 5-fold cross-validation and 50-seed evaluation pipelines, achieving 0.885 AUC and 0.783 balanced accuracy with SHAP-based model interpretation.

• Leveraging Agentic AI for Insight Generation and Evaluation in Visual Analytics

Sep 2025 – Present

- Designing an agentic AI framework to generate insights from raw data and from interactive visual analytics systems, enabling controlled comparison of how visual grounding affects insight quality and hallucination.
- Developing a multi-agent workflow (orchestrator, explorer, composer, verifier) with grounded interactions over VA systems to study evidence-backed reasoning, provenance, and failure modes in AI-generated insights.

• Map Visualization: Design Framework & Declarative Grammar [\[Open Source\]](#)

Aug 2022 – Present

- Collaborated with urban analytics researchers to identify design challenges in 45 studies of street-overlaid visualizations and proposed a design space for multivariate spatial network visualization.
- Developed StreetWeave, a declarative grammar and scalable pipeline for street-level visualizations, removing low-level coding barriers for domain experts. Enabled reproducible, multi-resolution visuals integrating thematic and physical data, used in real-world case studies for cross-domain analysis and decision support.
- Implemented a weather-aware routing extension that integrates time-varying weather forecasts with street-network data, using GNN-based edge-level weather impact estimation and route optimization to identify paths that minimize exposure to rain and other weather conditions.

• Visualization of Probability Distributions of Geographical Data

Aug 2021 – July 2022

- Adapted non-spatial probability encodings to geographic data, solving challenges in quantifying uncertainty.
- Led user study with 78 people on accuracy and usability, shaped best practices for spatial probability visualizations.

• Health Disparities in the Head and Neck Cancer Patient Population

Aug 2019 – April 2022

- Harmonized two large HNC datasets (448 UI Health patients & 644 MD Anderson patients) and collaborated with oncology and data-mining experts to define cohort-comparison tasks for health disparities analysis.
- Developed visual analysis tool for HNC data using machine learning approach, enabling oncologists to analyze demographics, disease characteristics, and treatments and outcomes differences across cohorts; evaluated with 39 experts and stakeholders (4 radiation oncologists, 1 oral oncology surgeon, 1 data-mining expert, 3 visual computing researchers, 30 senior health researchers at the University of Illinois Cancer Center).

• Visual Analysis of COVID-19 Forecast Ensemble Models [\[Open Source\]](#)

May 2021 – Oct 2021

- Built COVID-19 EnsembleVis, an open-source, browser-based system for evaluating pandemic forecast models at county-level granularity, exposing spatial disparities often missed at coarser scales.
- Enabled comparison of ensemble vs. individual models through spatial-temporal visualizations, helping researchers quantify uncertainty and assess prediction reliability across geographies.

Research Experience

University of Illinois at Chicago

Chicago, IL

Project Sidewalk – Accessibility Data Visualization Researcher

May 2025 – August 2025

- Designed and prototyped an interactive dashboard to support analysis of large-scale accessibility data, enabling users to explore patterns, create visualizations, and export results efficiently.
- Collaborated with researchers to translate accessibility-focused user needs into visual analytics features that improve data interpretation and decision-making for inclusive urban planning.

Genentech

South San Francisco, CA

Data Visualization and Machine Learning Intern

May 2024 – August 2024

- Collaborated with the gCS team (5 computational biologists, 3 ML engineers) to build a modular, browser-based VA tool for sequence-based gene expression models, supporting real-time inference, gene-expression and single-cell analysis, and LLM-assisted in-silico mutagenesis, attention analysis, and multi-sequence and cell-type comparison.
- Translated client needs into features and milestones, delivered an MVP, and iterated via usability studies; enabled no-code hypothesis testing, reduced time to insight by 6%, and removed backend compute; piloted by 15 researchers.

Teaching Experience

Department of Computer Science, University of Illinois at Chicago

Chicago, IL

Teaching Assistant

Jan 2021 – Present

- Courses: Visual data science, Data structure, Computer design & Virtual, Augmented, and Mixed Reality. Conducted office hours, graded labs, assignments, and projects of 60 students.

Department of Computer Science and Engineering, Eastern University

Dhaka, Bangladesh

Lecturer

May 2018 – July 2019

- Supervised undergraduate courses & labs: Human Computer Interaction, Data analysis and visualization, Web development, Digital logic Design, C/C++, Java and Matlab. Worked as assistant course coordinator and student advisor.

Publications

- Sanjana Srabanti**, G. E. Marai, and F. Miranda. "StreetWeave: A Declarative Grammar for Street-Overlaid Visualization of Multivariate Data." IEEE transactions on visualization and computer graphics. IEEE, 2025. [\[Link\]](#)
- Sanjana Srabanti**, et al. "A comparative study of methods for the visualization of probability distributions of geographical data." Multimodal Technologies and Interaction (MTI), 2022. [\[Link\]](#)
- Sanjana Srabanti**, et al. "A tale of two centers: Visual exploration of health disparities in cancer care." IEEE Pacific Visualization Symposium. IEEE, 2022. [\[Link\]](#)
- J. Flax-Hatch, **Sanjana Srabanti**, et al. "Visualizing Environmental Justice Issues in Urban Areas with a Community-based Approach." Spatial Data Science Symposium, 2021. [\[Link\]](#)
- Sanjana Srabanti**, G. E. Marai, and F. Miranda. "Covid-19 ensemblevis: Visual analysis of county-level ensemble forecast models." IEEE Workshop on Visual Analytics in Healthcare (VAHC). IEEE, 2021. [\[Link\]](#)
- H. Adal, N. Promy, **Sanjana Srabanti**, et al. "Android based advanced attendance vigilance system using wireless network with fusion of bio-metric fingerprint authentication." International Conference on Advanced Communication Technology (ICACT). IEEE, 2018. [\[Link\]](#)
- Sanjana Srabanti**, et al. "A proposed system for automatic vehicle monitoring and accident detection in Bangladesh." International Conference on Computer, Communication, Chemical, Material and Electronic Engineering (IC4ME2). IEEE, 2018. [\[Link\]](#)
- M. N. Islam, A. Zavin, **Sanjana Srabanti**, et al. "GiveMed: a webportal for medicine distribution among poverty-stricken people." IEEE Region 10 Humanitarian Technology Conference (R10-HTC). IEEE, 2017. [\[Link\]](#)

Skills

- Programming languages:** Python, Java, C/C++, JavaScript, TypeScript, MATLAB
- Web & Cloud Technologies:** HTML/CSS, Angular, React, Vue.js, Node.js, Next.js, Flask, AWS, Docker, RESTful APIs
- Visualizations:** D3.js, Tableau, Three.js, Vega-Lite, Plotly, R, ggplot2, Matplotlib, Power BI, Figma
- Machine Learning:** scikit-learn, PyTorch, TensorFlow, pandas, NumPy, GeoPandas, OpenAI
- Databases & Big Data Tools:** SQL, NoSQL, Snowflake, Spark,
- Graphics & Game Development:** WebGL, Blender, Unity
- Professional Skills:** Git (version control), teamwork, problem-solving, client interviewing, time management, creativity, leadership
- Research:** User studies (structured & semi-structured design experiments), in-person & remote evaluations (Amazon MTurk), quantitative, qualitative & mixed-method data analysis, systematic literature review, and survey

Selected Other Projects

Collaborative Visualization Toolkit for Communities and Decision Makers

Aug 2022 – Dec 2024

- Built a modular visualization toolkit and grammar to compose reusable data pipelines and UIs integrating climate, health, and sociodemographic data; helps teams explore heat patterns, identify vulnerable areas, and make decisions.
- Led co-design with 30+ stakeholders through workshops and interviews; distilled pain points into personas, key tasks, and reusable components that shaped the toolkit's architecture and interaction design.

Analyzing County-level COVID-19 Symptoms Pattern and Risk-factors

Sep 2021 – Dec 2021

- Implemented scalable ML and data mining pipelines to analyze county-level COVID-19 symptom patterns and risk factors associated with hospitalization, ICU admission, and mortality.
- Processed a 300 million row dataset with time-efficient ETL, feature engineering, and modeling workflows, using vectorized operations and incremental aggregation to keep runtimes practical.

Android Based Advanced Attendance System using Wireless Network and Bio-metric Fingerprint Authentication

Bachelor's Thesis

July 2017 – Dec 2017

- Designed and developed a smart attendance system using a custom Android app integrating biometric fingerprint authentication and Wi-Fi connectivity to verify both identity and physical presence.
- Implemented session-based login and real-time tracking to prevent proxy attendance and ensure continuous presence monitoring.

Honors & Awards

- **Grace Hopper Celebration (GHC) Scholarship** for attending GHC conference 2023
- **MIST Dean's List of honor** for excellent result – in the years 2017, 2016, 2015, and 2014
- **MIST University Merit Scholarship** for excellent result – in the years 2017, 2016, 2015, and 2014

Mentorship

- Mentored a high-school student **Carissa Chen** Aug 2023 - Aug 2024
Topic: Investigating environmental justice through urban data visualization
- Mentored a high-school student **Alexandra Jane Orantia** [\[Link\]](#) Aug 2022 - Apr 2023
Topic: Promoting environmental justice by using a community-based approach to design a midwest comprehensive visualization dashboard

Volunteering & Services

- **President: Girls Who Code College Loop**, University of Illinois at Chicago, Jan 2022 – July 2022
 - Improved retention in computer science and related disciplines, and helped in building community and developing a supportive network of female peers and connecting Girls Who Code alumni on campus.
- **Student Volunteer:** Provide essential support to the IEEE VIS Conference: 2022, 2025 (in-person), 2021 (remotely).
- **Conference Reviewer:**
 - IEEE VIS: 2022, 2023, 2024, 2025, 2026 - Reviewed both full and short papers.
 - EuroVIS: 2023, 2024, 2025 - Reviewed full papers.
 - CHI 2024 Late-Breaking Work: Reviewed full papers.
- **Invited Talk:** Presented research work at [NYU Visualization Imaging and Data Analysis Center \(VIDA\) Lab](#) and [IEEE VIS 2021 Satellite](#).

Related Coursework

Visual Data Science, Big Data Visualization and Analytics, Computer Algorithms, Data Mining and Text Mining, Database System, Machine Learning, Deep Learning, HCI, Software Design and Development, Video Game Design, Artificial Intelligence, Object Oriented Design.