Saugat Pandey

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Research Statement

My research focuses on advancing human-computer interaction by evaluating and leveraging AI technologies, particularly large language models and computer vision techniques, to develop robust visualization tools that enhance decision-making. Through systematic evaluation of AI models and development of visualization literacy metrics, I strive to create adaptive interfaces that effectively blend artificial and human intelligence for real-world applications.

Education

2021–Present **PhD, Computer Science & Engineering**, *Washington University in St. Louis*, Missouri, USA.

2021–2024 **Master in Computer Science**, *Washington University in St. Louis*, Missouri, USA.

2017–2021 **Bachelor of Science, Computer Science & Mathematics**, *Beloit College*, Wisconsin, USA.

Research Experience

Visual Interface and Behavior Exploration Lab (VIBE) @ Washington University

November 2021 – present ***Graduate Research Assistant***.

- Collaborate in the design and development of visualization tools, focusing on enhancing user data visualization skills and apply statistical analysis to investigate how human perception influences visualizations.
- Provide design guidelines to visualization experts for creating visualizations for effective communication.
- Conduct research on the application of visualizations in real-world scenarios, leveraging cutting-edge AI/ML techniques such as Computer Vision and Multimodal Large Language Models (MLLMs).

Skills: Data Visualization, Statistical Analysis, Psychometrics, Crowdsourcing, AI/ML, Computer Vision, MLLMs (GPT, LLAVA, LLAMA, Claude, Gemini), Fine tuning, Prompt engineering, UX Design

American Institutes for Research

June 2024 – October 2024 ***Doctoral Student Research Intern***.

- Collaborated on research examining environmental impacts on student performance using PurpleAIR and EPA data; applying clustering algorithms to predict environmental conditions around school districts using historical API data.
- Developed interactive D3.js dashboard visualizing students' NAEP Math engagement; conducted statistical analysis on demographic variables to support data-driven educational policy decisions.

Skills: D3.js, React.js, Node.js, Statistical Analysis (Descriptive & Inferential), Data Visualization, API Data Extraction, Clustering Algorithms, Large Scale Data Analysis, Relational Database Management System (RDBMS)

The Brent Lab @ Washington University

August 2021 – October 2021 ***Graduate Research Assistant***.

- Developed an automated image processing tool using Python and OpenCV to generate precise segmentation masks for Cryptococcus neoformans microscopy images, significantly reducing manual annotation time and improving data preparation efficiency for downstream analysis.
- Designed and trained a convolutional neural network (CNN) using PyTorch to analyze Cryptococcus neoformans images, enhancing the lab's capacity for high-throughput fungal phenotype analysis by identifying cellular structures and morphological features.

Skills: Python, OpenCV, Image Processing, PyTorch, CNN, Deep Learning

Publications

In Conference Proceedings

2025 **Saugat Pandey** and Alvitta Ottley. Benchmarking visual language models on standardized visualization literacy tests. EuroVIS 2025, Computer Graphics Forum *(In Submission)*, 2025.

2025 Oen G. McKinley, **Saugat Pandey**, and Alvitta Ottley. Trustworthy by design: The viewer's perspective on trust in data visualization. ACM Conference on Human Factors in Computing Systems (CHI) - *(In Submission)*, 2025.

2024 R. Jordan Crouser, Syrine Matoussi, Lan Kung, **Saugat Pandey**, Oen G. McKinley, and Alvitta Ottley. Building and eroding: Exogenous and endogenous factors that influence subjective trust in visualization. IEEE VIS, 2024.

2023 **Saugat Pandey** and Alvitta Ottley. Mini-vlat: A short and effective measure of visualization literacy. volume 42. Computer Graphics Forum, Wiley Online Library 🏆, 2023.

2023 **Saugat Pandey**, Oen G. McKinley, R. Jordan Crouser, and Alvitta Ottley. Do you trust what you see? toward a multidimensional measure of trust in visualization. IEEE VIS, 2023.

Workshop Paper(s)

2022 Robert Kasumba, **Saugat Pandey**, Vishesh Patel, Micah Wolfson, and Alvitta Ottley. User engagement with covid-19 visualizations on twitter. Visualization for Communication (VisComm), IEEE VIS, 2022.

Awards & Honors

May 2023 Earned **top 15-20% Departmental Honors** through annual review consensus at Washington University in St. Louis.

March 2023 **Best Paper Award** for "Mini-VLAT: A Short and Effective Measure of Visualization Literacy" at EuroVIS 2023 (Leipzig, Germany).

January 2021 **Conwell-Huffer Endowed Prize in Mathematics** for outstanding senior mathematics or computer science student at Beloit College.

Presentations

May 2023 Presented paper titled "Mini-VLAT: A Short and Effective Measure of Visualization Literacy" at EuroVIS, 2023

October 2022 Presented paper titled "User engagement with covid-19 visualizatios on twitter" at VisComm workshop (IEEE VIS), 2022

Teaching Experience

August 2024 - December 2024 **Co-Instructor**, *Washington University in St. Louis*.
Course: Introduction to Visualization

Service & Activities

October 2024 **Web Chair and Paper Session Chair**, *Visualization in Data Science (VDS) @ IEEE VIS 2024*.

July 2022 - Present **Reviewer**, *IEEE VIS 2024 & VDS 2024 & VisComm 2022 & 2023 (IEEE VIS) & PacificVIS 2023* .

May 2024 - Present **President**, *Association of Graduate Engineering Students*, Washington University in St. Louis.

May 2023 - January 2024 **Consultant**, *The Biotechnology and Life Science Advising (BALSA) Group*.

2019 - 2021 **Co-Founder & President**, *Beloit Investment Club*, Beloit College.

Programming skills

Languages & Libraries: Python, JavaScript, R, JAVA, SQL, tensorflow, keras, PyTorch, scikit-learn, OpenCV

Other Tools: MySQL, AWS, Git, Django, Flask, Tableau, PowerBI