Sneha Gathani

5th year PhD Candidate in Computer Science
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RESEARCH INTERESTS

Data-Driven Decision-Making Systems, Interactive Data and Visual Analytics Systems, Business Analytics and Decision-Making

EDUCATION

PhD in Computer Science, *University of Maryland, College Park, GPA: 3.77/4.* — *College Park, USA*
Advisor: *Leo Zhicheng Liu* — *June 2020 – May 2025 (expected)*

Masters in Computer Science, *University of Maryland, College Park, GPA: 3.77/4.* — *College Park, USA*
Advisor: *Leilani Battle* — *Aug 2018 – May 2020*

Bachelor of Computer Engineering, *Pune Institute of Computer Technology, India, GPA: 3.77/4.* — *Pune, India*
Top 10 in cohort of size 900 — *Aug 2014 – May 2018*

PUBLICATIONS

CHI 2025 Paper	P.6	**What-If Analysis for Business Users: Current Practices and Future Opportunities** **Sneha Gathani,** Zhicheng Liu, Peter J. Haas, Çağatay Demiralp
VIS 2024 Paper | Talk	P.5	**Groot: A System for Editing and Configuring Automated Data Insights** **Sneha Gathani,** Anamaria Crisan, Vidya Setlur, Arjun Srinivasan
EuroVis 2022 Paper | Talk	P.4	**A Grammar-Based Approach for Applying Visualization Taxonomies to Interaction Logs** **Sneha Gathani,** Shayan Monadjemi, Alvitta Ottley, Leilani Battle
CIDR 2022 Paper | Talk	P.3	**Augmenting Decision Making via Interactive What-If Analysis** **Sneha Gathani,** Madelon Hulsebos, James Gale, Peter J. Haas, Çağatay Demiralp
CIDR 2022 Abstract	P.2	**Making Table Understanding Work in Practice** Madelon Hulsebos, **Sneha Gathani,** James Gale, Isil Dillig, Paul Groth, Çağatay Demiralp
CHI 2020 Paper | Talk	P.1	**Debugging Database Queries: A Survey of Tools, Techniques, and Users** **Sneha Gathani**, Peter Lim, Leilani Battle

RESEARCH

PhD Graduate Research — *UMD, College Park, USA*

Praxa: A Standardized Approach to What-If Analysis — *Fall 2022 – 2024*
Introducing Praxa, **a standardized framework for what-if analysis** and put this into practice using **a declarative language**, Praxa Specification Language. Demonstrated its expressiveness through three diverse application domains. **Under Review:** *TVCG 2025*

What-If Analysis for Business Users: Current Practices and Future Opportunities — *Fall 2021 – 2024*
Conducted two-part interview study with professional business users (marketing, sales, product, and operations managers) to understand their **use of what-if analysis for decision-making** and developed **Decision Studio, a visual analytics system**, as a probe to assess business users' **hands-on use** of functionalities and identify their future opportunities. **Paper:** P.6 (***CHI 2025***)

Masters Graduate Research — *UMD, College Park, USA*

A Grammar-Based Approach for Applying Visualization Taxonomies to Interaction Logs — *Summer 2020 – Fall 2021*
Translated and demonstrated the applicability of theoretical visualization task **taxonomies** on empirical interaction logs via developing **programmatic mappings** of taxonomies. **Paper:** P.4 ***(EuroVis 2022)***

TraceInspector: A Visualization-based Reverse Engineering Tool for Android Apps — *Spring 2019 – 2020*
Developed TraceInspector, an interactive visualization tool that helps novice analysts **reverse engineer Android apps** for potential security and privacy vulnerabilities.

Debugging Database Queries: A Survey of Tools, Techniques and Users — *Summer 2019*
Performed interdisciplinary literature review and conducted interview study to **understand database query debugging strategies and tools**.
Paper: P.1 ***(CHI 2020)***

Independent Research — *UMD, College Park, USA*

C.A.T.C.H. – Characterizing and Tracking College Health — *Winter 2019 – Spring 2019*
Analyzed temporal and geographic data of the university using Python and scikit-learn library by applying **machine learning algorithms**, specifically **K-nearest neighbor classification and K-means clustering** to find students in close proximities. **Detected patterns** were concluded to cause spread of contagious diseases.

WORK EXPERIENCE

Microsoft Research — *Seattle, USA*
Research Intern, Mentor: *Steven Drucker* — *Summer 2024*

Recommend-o-Matic: Facilitating Analysts Create Interactive Explanations of Decisions and their Trade-Offs
Developing a domain-specific language (DSL) to empower data analysts to quickly and easily generate interactive documents consisting of text, visualizations, interactions, and annotations to effectively communicate the explanations of recommended decisions and their associated trade-offs to stakeholders. **Under Progress** ***(Target: UIST 2025)***

Salesforce/Tableau Research — *Seattle, USA*
Research Intern, Mentor: *Arjun Srinivasan* — *Summer 2023*

Groot: A System for Editing and Configuring Automated Data Insights
Developed a prototype system that allows users to proactively **edit, customize, and reconfigure automated data insights** within visualization tools. The system allows for receiving additional insight recommendations using direct manipulation of chart elements, customizing underlying logic of existing generated insights, and define new insights by specifying new heuristics via an interactive editing interface. **Paper:** P.5 ***(VIS 2024 Short Paper)***

Sigma Computing Inc. — *San Francisco, USA*
Research Intern, Mentor: *Çağatay Demiralp* — *Summer, Fall 2021*

Augmenting Decision Making via Interactive What-If Analysis
Delivered Decision Studio, an interactive visual data analysis system that enables business users to **understand input data drivers-output KPI metric relationships** through what-if scenarios using four predictive and prescriptive (PPA) functionalities; validated through three common business uses with Sigma employees. **Paper:** P.3 ***(CIDR 2022)***

Making Table Understanding Work in Practice
Discuss the challenges of deploying table understanding models and propose SigmaTyper framework for the semantic column type detection task. **Paper:** P.2 ***(CIDR 2022)***

Cybage Software Pvt Ltd. — *Pune, India*
Summer Intern — *Summer 2017*

Built prototypes of recommendation systems using **KNN and regression models** to aggregate it's clicks. Analyzed customers feedbacks using **NLP techniques**. Pitched features for optimization in inventory systems using computer vision.

SKILLS

Programming Languages	Python, C++, React, JavaScript, Material UI, HTML/CSS
Web Frameworks	Flask, Ruby on Rails
Data Analysis Tools	Python (pandas, numpy, sklearn), Keras, PyTorch
Visualization Tools	D3.js, Cytoscape.js, Vega-Lite, Tableau
Database Tools	PostgreSQL, MySQL
Design Tools	Photoshop, Illustrator, CorelDRAW
Other Tools	LaTeX, GitHub
Qualitative Research	Interviews, Surveys, Iterative Coding

COURSES TAKEN

University of Maryland, College Park

Interactive Data Analytics, Database System Architecture and Implementation, Computational Linguistics I, Interactive Technologies in HCI, Advanced Deep Learning, Advanced Computer Graphics, Wireless Technologies and IoT, Statistical Pattern Recognition, Computer Vision, AI Planning, AI and Existential Threats to Civilization

Pune Institute of Computer Technology, India

Data Structures, Discrete Mathematics, Databases, Compilers, Data Mining, Natural Language Processing

TEACHING EXPERIENCE

University of Maryland, College Park

CMSC 734: Information Visualization, CMSC 250: Discrete Structures, CMSC 320: Introduction to Data Science, CMSC 411: Computer Architecture, CMSC 216: Introduction to Computer Systems

Pune Institute of Computer Technology, India

Natural Language Processing

MENTORSHIP

Peter Lim *(Senior, UMD)*: Guided to develop an interactive visualization application, form interview questions, conduct interview studies and write research paper

Raghav Thind, Kevin Li, Matthew Xu *(Sophomore, UMD)*, Sirui Zeng *(MS, UMD)*: Guided to conduct literature review and write research paper

ACHIEVEMENTS

Received the **inclusivity scholarship** for VIS 2024 and a **student volunteer** at VIS 2024	*September 2024*
Re-awarded the **Jacob K. Goldhaber Travel Grant** for VIS 2024	*August 2024*
Awarded scholarship to attend GHC 2022 in-person	*September 2022*
Student Volunteer at EuroVis 2022	*Summer 2022*
Received the **International Conference Student Support Award (ICSSA)** for EuroVis 2022	*Spring 2022*
Received the **Jacob K. Goldhaber Travel Grant** for EuroVis 2022	*Spring 2022*
Student Volunteer at VIS 2021	*Fall 2021*
Led the **CHI 2020 conference** reading group	*Spring 2021*
Led the **InfoVis 2018-20 conference** reading group	*Fall 2020*
One of the 70 students selected across universities worldwide for summer school at **The Cornell, Maryland, Max Planck Pre-Doctoral Research School (CMMRS)**	*Germany, Aug 2019*
Institute of Electrical and Electronic Engineers (IEEE) Region 10 Coordinator (2018-19), Program Outreach Coordinator (2017-18), SYWLC Congress Event Coordinator (2017), Head of Graphics Team, Lead designer of technical newsletter	*2015 - 2019*
Pune Action Group Leader for **Child Rights and You (CRY)** NGO	*2016 - 2018*
Established **TEDx** independent organization in undergrad school and led the Xperience and Design team	*2016*
Hack2Innovate Deep Learning Hackathon Winner	*June 2017*
Smart City Hackathon runner-up for designing and implementing prototype to make admissions and campus recruiting procedure less cumbersome	*September 2016*