Sneha Gathani

2nd year PhD Student in Computer Science

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RESEARCH INTERESTS

Data-driven Decision-Making Systems, Systems for Visualization and Trust in ML, Interactive Visual Data Systems, Human-Centered AI, Human-Computer Interaction

EDUCATION

PhD in Computer Science, *University of Maryland, College Park, GPA: 3.77/4.* — *College Park, US* — *June 2020 – May 2024 (expected)*
Advisor: Prof. Zhicheng (Leo) Liu, Human-Data Interaction (HDI) Group | Previous: Prof. Leilani Battle, BAttle Data (BAD) Lab

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

Bachelor of Computer Engineering, *University of Pune*, India, **GPA**: *3.77/4.* — *Pune, India* — *Aug 2014 – May 2018*
Top 10 in B.E.Comp Engg. Batch of 2018

PUBLICATIONS AND TALKS

2022 P.3 — **Augmenting Decision Making via Interactive What-If Analysis**
Sneha Gathani, Madelon Hulsebos, James Gale, Peter J. Haas, Çağatay Demiralp
CIDR: Conference on Interactive Data Systems Research. Chaminade, Santa Cruz. *(Acceptance Rate: <30%)* | **Full paper**

2022 P.2 — **Making Table Understanding Work in Practice**
Madelon Hulsebos, **Sneha Gathani,** James Gale, Isil Dillig, Paul Groth, Çağatay Demiralp
CIDR: Conference on Interactive Data Systems Research. Chaminade, Santa Cruz. *(Acceptance Rate: <30%)* | **1-page abstract**

2020 P.1 — **Debugging Database Queries: A Survey of Tools, Techniques, and Users**
Sneha Gathani, Peter Lim, Leilani Battle
CHI: Conference on Human Factors in Computing Systems. Honolulu, Hawaii. *(Acceptance Rate: 23.8%)* | **Full paper**

WORKS UNDER REVIEW

2022 UR.1 — **A Programmatic Approach to Make Visualization Taxonomies Actionable in Log Analysis Contexts**
Sneha Gathani, Shayan Monadjemi, Alvitta Ottley, Leilani Battle
EuroVis: Visualization Conference organized by the Eurographics Working Group on Data Visualization. December, 2022

RESEARCH

University of Maryland — *College Park, USA*

Graduate Research, HDI Lab, Prof. Zhicheng (Leo) Liu

Building End User's Trust For Regression Machine Learning Models — *Sept 2021 – Present*
Many tools have been developed to understand interpretability and explanation of models in order to foster trust in data scientists and ML experts. Few tools also target non-expert end users, but they all target simple classification models. In this project, we aim to develop a tool that can foster trust in non-expert end users for regression models

Graduate Research Assistant, Prof. Leilani Battle

A Grammatic Approach to Make Visualization Taxonomies Actionable in Log Analysis Contexts, *Collaborator: Prof. Alvitta Ottley* — *May 2020 – Fall 2021*
Translating theoretical visualization activity **taxonomies to be actionable** to empirical provenance logs. Developing **programmatic mappings** of taxonomies that label provenance logs to corresponding taxonomy categories and allow measuring the **applicability of taxonomies** to empirical provenance logs quantitatively. Guiding **recommendations** on how existing taxonomies could be augmented, or new taxonomies could be developed with respect to empirical logs, to better support and guide user interactions. **Under review** – UR.1**. Target Conference:** EuroVis 2022

TraceInspector: A Visualization-based Reverse Engineering Tool for Android Apps, *Collaborator: Prof. Michelle Mazurek* — *Jan 2019 – April 2020*
Developed **an interactive tool**—TraceInspector—that helps novice analysts **reverse engineer Android apps** for potential security and privacy vulnerabilities. The tool integrates both static and dynamic Android app data, connects relevant temporal event sequences and method dependencies and executes app code in a single visualization interface. Conducted user study to test usability, features and strengths and weaknesses of the tool

Debugging Database Queries: A Survey of Tools, Techniques and Users — *Feb 2019 – Sept 2019*
Performed interdisciplinary literature review of 110+ works to **understand database query debugging strategies and tools** proposed in research. Conducted interview study to **understand debugging approaches** being adopted by users in the industry. Proposed design guidelines to help system designers build features that match user's debugging strategies. **Paper:** P.1 *(Full paper - Oral)*

Independent Researcher, MIND Lab, Prof. Ashok Agrawala

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

WORK EXPERIENCE

Sigma Computing Inc.
Research Intern, Mentor: Çağatay Demiralp

San Francisco, USA
(Remote)

Augmenting Decision Making via Interactive What-If Analysis

Summer 2021,
Fall 2021 (Part-time)

Developed an **interactive visual data analysis system**—Decision Studio—that enables **business users** to **experiment** with their data (customer or product related) and **understand relationships** between input predictors and interested output KPI metrics through **changing what-if scenarios**. Implemented four features leveraging ML models: driver importance analysis, sensitivity analysis, goal seeking analysis and constrained analysis. Evaluated system using three **common business use cases** with Sigma business employees. **Paper:** P.3 *(Full paper - Oral)*

Making Table Understanding Work in Practice

Summer 2021

Discuss the challenges of deploying table understanding models and propose SigmaTyper framework for the semantic column type detection task. **Paper:** P.2 *(1-page Abstract)*

Cybage Software Pvt. Ltd.
Summer Intern

Pune, India

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

Summer 2017

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
Visualisation Tools	D3.js, Cytoscape.js, 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, USA

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
Pune, India

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

TEACHING EXPERIENCE

University of Maryland
Graduate Teaching Assistant

College Park, USA

School of Computer, Mathematical, Natural Sciences (CMNS) – Department of Computer Science (CMSC)

CMSC 250: Discrete Structures

Spring 2022, Fall &
Spring 2018, Summer
2019, Fall & Spring 2019

CMSC 411: Computer Architecture

Summer 2019

MENTORSHIP

Peter Lim *(Senior, UMD)*: Guided to develop Flask application, form interview questions, conduct interview studies and write research report

ACHIEVEMENTS

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 student branch Graphics Team, lead designer of college technical newsletter; *P.I.N.G.*	2015 – 2019
Pune Action Group Leader for **Child Rights and You (CRY)** NGO	2016 – 2018
Established **TEDx** independent organisation in undergraduate school and led the Experience 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	Sept 2016