

CHAHAT KALSI

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Education

New York University

PhD in Computer Science

Advisors: Prof. Robert Krüger, Prof. Qi Sun

Sep'25 - May'30 (Expected)

New York, United States

GPA: 3.95 / 4.0

Stony Brook University

Master of Science in Computer Science

Advisor: Prof. Arie Kaufman

Aug'23 - May'25

New York, United States

GPA: 3.84 / 4.0

Panjab University

Bachelor of Engineering in Computer Science

Advisor: Prof. Sukhwinder Singh

Aug'19 - June'23

Chandigarh, India

GPA: 9.04 / 10.0

Research Interests

I am interested in 3D computer graphics, interactive visualization, and immersive environments. I develop interactive techniques for exploring complex volumetric data, spanning **focus+context volume rendering**, **LLM-based scene augmentation**, immersive and **AR/VR interfaces**, and **human-centric machine learning** for interactive 3D graphics.

Research & Industry Experience

VIDA Center, New York University

PhD Researcher

New York, United States

Sep'25 - Present

- Building scalable visual analytics for terabyte-scale 3D microscopy and multiplexed tissue images of tumors.
- **BioSET**. ([Bio+MedVis Challenge @ IEEE VIS 2025](#), [Award of Excellence](#)) Interactive web-based multi-volume rendering and human-in-the-loop visual analytics approach that reveals where protein biomarkers co-localize in 3D tissue.
- **CellGalaxy**. Linked exploration of spatial deep learning embeddings spanning millions of cell images, with semantic zooming approaches.
- Integrating vision-language models and LLMs to label regions of interest and describe findings in context.

Center for Visual Computing, Stony Brook University

Graduate Student Researcher

New York, United States

Jan'24 - May'25

- Built graphics and visualization systems for large high-resolution displays powered by multi-node, multi-GPU clusters.
- **Silo** ([IEEE VR 2025](#)). Built an OpenGL engine with multi-node stereo rendering for a 360° cylindrical display of 168 panels and 619M pixels. Used conformal mapping and optimal transport to recover the missing floor and ceiling views.
- **AuxiScope** ([IEEE ISMAR 2025](#)). Built a Unity system that overlays personalized AR views on handheld iPads.
- **FlexiCAVE**. Built a custom VTK volume rendering engine for an 83M-pixel stereo wall with rotating display columns.

Center for Excellence in Wireless and Information Technology

Graduate Assistant

New York, United States

Sept'24 - May'25

- Optimized real-time power line segmentation models for vegetation management using RayTune and Fast-SCNN.

Research Assistant

Jun'24 - Aug'24

- Built a PyTorch segmentation framework to detect power lines in drone imagery, reaching 0.70 IoU on TTPLA dataset.

Goldman Sachs

Software Development Intern

Bengaluru, India

Feb'23-Jun'23

- Automated firm-wide Cash Gap report generation using Apache Spark (Java) for data processing and Apache Kafka for data streaming.
- Developed a Java Spring Boot MVC backend to streamline the Cash Gap report approval process.
- Implemented comprehensive unit tests using Mockito and JUnit.

Summer Analyst Intern

Jul'22-Sep'22

- Developed a Java Spring Boot application to integrate static CSV data into the database.
- Wrote unit and integration tests for the application.

Nottingham Trent University

Research Intern

Chandigarh, India (Remote)

Jul'21-Mar'22

- Led a project on ADHD assessment, involving denoising EEG signals utilizing advanced techniques such as Independent Component Analysis (ICA), bandpass and notch filtering, and wavelet transforms.
- Developed interactive EEG signal visualization tools in Python, significantly improving data analysis efficiency.

Publications

BioSET: Interactive Visual Analysis of Biomarker Co-localization in Large Multi-Volume Tissue Data

C. Kalsi, H. Fathollahian, L. Reichman, S. Gaupp, Y. Shen, A. Shabanova, A. Junquera, A. Szabó, A. Rodríguez, T. Vallius, M. Rogava, G. E. Marai, M. Krone, S. Boorboor, and R. Krueger

IEEE Transactions on Visualization and Computer Graphics (TVCG) (Under Review)

CellGalaxy: Multiscale Exploration of Biomedical Image Embeddings

Y. Shen, C. Kalsi, P. Motarwar, D. Annuar, J. Stimes, S. Sterling, S. Qiu, I. Illa-Bochaca, I. Osman, D. Fenyo, G. J. Baker, E. Hernando, K. Ruggles, A. Tsirigos, and R. Krueger

IEEE Transactions on Visualization and Computer Graphics (TVCG) (Under Review)

BioSET: Biomarker-based Spatial co-Expression analysis in Tumor environments Award of Excellence

C. Kalsi, Y. Shen[†], S. Gaupp[†], L. Reichmann[†], M. Rogava, M. Krone, S. Boorboor, and R. Krueger

Bio+MedVis Challenge, IEEE Visualization and Visual Analytics (VIS), 2025 ([†]equal contribution)

AuxiScope: Handheld Augmented Reality Tablet as an Auxiliary Display for Large-Scale Display Systems

M. Castellana, C. Kalsi, Y. Kim, S. Boorboor, and A. Kaufman

IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2025

Silo: Half-Gigapixel Cylindrical Stereoscopic Immersive Display

S. Boorboor[†], D. Gutiérrez-Rosales[†], A. Shoaib, C. Kalsi, Y. Wang, Y. Cao, X. Gu, and A. Kaufman

IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 2025 ([†]equal contribution)

Honors & Awards

Best Poster Award

Oct'26

European Society for Spatial Biology (ESSB) Conference, 2026

Early-Career Travel Award

Sep'26

European Society for Spatial Biology (ESSB) Conference, 2026

Award of Excellence

Nov'25

Bio+Med Vis Challenge, IEEE Visualization and Visual Analytics (VIS) Conference, 2025

School of Engineering Fellowship

Sep'25-Aug'26

New York University

Graduate Fee Scholarship

2024-2025

Stony Brook University

Graduate Tuition Scholarship

2024-2025

Stony Brook University

Graduate International Students' Fee Scholarship

2024-2025

Stony Brook University

Overall Third and Best Solo

Nov'21

HackUIET 2021 hackathon by UIET, Panjab University

First Place prize in category "Make your own Social Media Website"

Feb'21

HackHer413 2021 hackathon by University of Massachusetts Amherst

Teaching & Mentoring

New York University

Sep'25 - May'26

Graduate Course Assistant

New York, United States

- Course assistant for graduate level Information Visualization course, mentoring 50 students in d3.js for 2 semesters.

Stony Brook University

Aug'24 - Dec'24

Graduate Teaching Assistant

New York, United states

- Teaching assistant for graduate level Computer Graphics course, helping over 30 students with C++ and OpenGL code.

Technical Skills

Languages: C, C++, C#, Python, JavaScript, Java, SQL, HTML/CSS

Graphics APIs: OpenGL, WebGL, WebGPU, GLSL, WGLSL, HLSL, Three.js, VTK (C++, Python, js)

Visualization Libraries: d3.js, Matplotlib, Seaborn

Engines: Unity