Gaurav Jain

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Research Areas

Human-Computer Interaction, AI-driven Interactive Systems, Accessibility, Computer Vision & Deep Learning

Education

Ph.D. in Computer Science — Sep 2020 – Sep 2025 *(expected)*
Columbia University, USA
Advisor: Brian A. Smith

B.S. in Computer Science — Aug 2016 – May 2020
Delhi Technological University, India

Research Internships

AIML Research Intern, Apple, Seattle, USA — May 2024 – Aug 2024
Mentors: Cole Gleason, Leah Findlater
Accessibility research with the Human-Centered Machine Intelligence (HCMI) team.
Manuscript in submission.

Selected Publications

[C10] **G. Jain**, B. Hindi, Z. Zhang, K. Srinivasula, M. Xie, M. Ghasemi, D. Weiner, S. Paris, X. Xu, M. Malcolm, M.Turkcan, J. Ghaderi, Z. Kostic, G. Zussman, B. A. Smith. "*StreetNav: Leveraging Street Cameras to Support Precise Outdoor Navigation for Blind Pedestrians*" in Proceedings of the Annual ACM Symposium on User Interface Software and Technology (**UIST 2024**). PDF

[C9] **G. Jain**, B. Hindi, C. Courtien, C. Wyrick, X. Xu, M. Malcolm, B. A. Smith. "*Front Row: Automatically Generating Immersive Audio Representations of Tennis Broadcasts for Blind Viewers*" in Proceedings of the Annual ACM Symposium on User Interface Software and Technology (**UIST 2023**). PDF

[C8] **G. Jain**, Y. Teng, D. Cho, Y. Xing, M. Aziz, B. A. Smith. "*I Want to Figure Things Out: Supporting Exploration in Navigation for People with Visual Impairments*" in Proceedings of the ACM on Human-Computer Interaction (**CSCW 2023**). PDF
Impact Recognition Award

[C7] **G. Jain**, B. Hindi, M. Xie, Z. Zhang, K. Srinivasula, M. Ghasemi, D. Weiner, X. Xu, S. Paris, C. Tedjo, J. Bassin, M. Malcolm, M.Turkcan, J. Ghaderi, Z. Kostic, G. Zussman, B. A. Smith. "*Towards Street Camera-based Outdoor Navigation for Blind Pedestrians*" in Proceedings of the 25th International ACM SIGACCESS Conference on Computers & Accessibility, Posters (**ASSETS 2023**). PDF

[C6] **G. Jain**, B. Hindi, C. Courtien, C. Wyrick, X. Xu, M. Malcolm, B. A. Smith. "*Towards Accessible Sports Broadcasts for Blind and Low-Vision Viewers*" in Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Extended Abstracts (**CHI 2023**). PDF

[C5] A. S. Parihar, **G. Jain***, S. Chopra*, S. Chopra*. "*SketchFormer: Transformer-based Approach for Sketch Recognition using Vector Images*" in Multimedia Tools and Applications, 2021. PDF

[C4] **G. Jain***, S. Chopra*, S. Chopra*, A. S. Parihar. "*Attention-Net: An Ensemble Sketch Recognition Approach using Vector Images*" in IEEE Trans. on Cognitive and Developmental Systems, 2020. PDF

[C3] **G. Jain*,** N. Awasthi*, S. K. Kalva, M. Pramanik, P. K. Yalavarthy. "*Deep Neural-Network Based Sinogram Super-resolution and Bandwidth Enhancement for Limited Data Photoacoustic Tomography*" in IEEE Trans. on Ultrasonics, Ferroelectrics, and Frequency Control, 2020. PDF

[C2] G. S. Walia, **G. Jain**, N. Bansal, K. Singh. "*Adaptive Weighted Graph Approach to Generate Multimodal Cancelable Biometric Templates*" in IEEE Trans. on Information Forensics and Security, 2020. PDF

[C1] **G. Jain***, S. Chopra*, S. Chopra*, A. Parihar. "*TransSketchNet: Attention-based Sketch Recognition using Transformers*" in Proceedings of 24th European Conference on Artificial Intelligence (ECAI 2020). PDF

**Equal contribution*

Research Experience

Graduate Research Assistant, **Columbia University,** New York, USA	Sep 2020 – Present
Research Fellow, **Université Clermont Auvergne**, Clermont-Ferrand, France	Jun 2020 – Jul 2020
Undergraduate Research Assistant**, Delhi Technological University**, Delhi, India	Jan 2019 – May 2020
Research Assistant**, Indian Institute of Technology**, Delhi, India	Sep 2018 – Feb 2020
Summer Research Fellow, **Indian Institute of Sciences**, Bangalore, India	May 2019 – Aug 2019
Research Assistant, **Defense Research & Development Organization**, Delhi, India	Feb 2018 – Nov 2019

Selected Press Coverage

CEAL Lab wins Impact Recognition Award at CSCW 2023 *Columbia Engineering*	2023
Creating tools to help people with vision impairments navigate the world *Voices of CS*	2023
Using AI to help blind and low vision users 'see' *Columbia Engineering Magazine*	2021

Awards & Recognitions

Impact Recognition Award, ACM CSCW 2023 *(details)*	2023
Professional Development Scholarship, Columbia University *(details)*	2023
Gary Marsden Travel Award, ACM SIGCHI *(details)*	2023
Greenwoods Fellowship, Columbia University *(details)*	2020
Research Excellence Award, Delhi Technological University	2020, 2021
Summer Research Fellowship, Indian Academy of Sciences	2019

Invited Talks & Lectures

NSF Center for Smart Streetscapes (CS3) Research Exchange (*details*) Mar. 2024
Leveraging street cameras to support precise outdoor navigation for blind pedestrians.

Vision Zero Research on the Road Symposium, New York City Government (*details*) Nov. 2023
Leveraging street cameras to support precise outdoor navigation for blind pedestrians.

Guest Lecture, COMS E6178: HCI Research Seminar, Columbia University Feb. 2023
How to give effective research presentations?

Community & Professional Services

Organizing Committee 2024 – Present
Publicity Co-chair, UIST 2024
Publicity Chair, UIST 2025

Student Volunteer 2023 – Present
CHI 2024, ASSETS 2023

External Reviewer 2021 – Present
CHI 2021-25, ASSETS 2023, CSCW 2022-24**,** UIST 2023-24, IMWUT 2024

Women in Science (WISC) Mentoring Program, Barnard University 2022
Mentored undergraduates to help prepare a roadmap toward their career goals.

Pre-Submission Application Review Program, Columbia University 2020
Advised PhD applicants from underrepresented backgrounds.

Teaching & Research Mentoring Experience

Teaching Assistant, Columbia University
COMS W4170: *User Interface Design* — Fall 2021/22/23/24
COMS E6178: *Human-Computer Interaction (Research Seminar)* — Spring 2021/22/23

Amazon SURE Program Mentor, Columbia University & Amazon Inc. — 2022/23
Mentored visiting undergraduates on research projects (details).
Conrad Wyrick *(University of Florida),* Maryam Aziz *(University of Connecticut)*
Dan Weiner *(Lehman College, CUNY)*

XR Access REU Program Mentor, National Science Foundation — 2022/23
Mentored visiting undergraduates on accessibility research (details).
Xinyi Xu *(Pomona College*), Sophie Ana Paris (*NYU*),
Chloe Tedjo (*Texas A&M University*), Josh Bassin (*Penn State University*)

Mentor, VISIONS services for the blind and visually impaired — 2020 – Present
Co-designing solutions with and mentoring blind & low-vision students (details).
Michael Malcolm *(SUNY at Albany),* Connor Courtien *(Hunter College)*
Sebastián Mercado Sáez *(Fordham University)*

Research Lead, Columbia University — 2020 – Present
Managing research projects and mentoring students at the CEAL Lab.
B.S. students: David Rios, Ethan Chang, Jessica Peng.
M.S. students: Zihao Zhang, Koushik Srinivasula, Uttam Gurram, Aditi Patil, Lindsey Weiskopf, Mingyu Xie, Basel Hindi, David Cho, Yunhao Xing, Arjun Nichani, Yuanyang Teng.

Skills

Research: System Development & Prototyping, User Interface Design, User Evaluations (Study design, Statistical analysis), Qualitative Research (Thematic analysis, Grounded theory approach, Critical incident technique), Co-design.

Languages & Frameworks*:* C, C++, Python, MATLAB, Swift, TensorFlow, PyTorch, Keras, OpenCV, Robot Operating System (ROS), Linux, Unity, AWS Mechanical Turk, HTML, CSS, Javascript, R, Hive, Cloudera, Docker, Blender, Paraview.

Design: Balsamiq, Figma, Affinity Photo, Adobe Photoshop, Adobe Premiere Pro, MS Office.