

Gaurav Jain

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https://gaurav1302.github.io/

Research Areas



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

Education

Ph.D. in Computer Science Columbia University, USA <i>Advisor:</i> Brian A. Smith <i>Committee:</i> Steven K. Feiner, Carl Vondrick	Sep 2020 – May 2025 (expected)
M.S. in Computer Science Columbia University, USA	Sep 2020 – May 2022
B.S. in Computer Science Delhi Technological University, India	Aug 2016 – May 2020

Publications

Full Conference and Journal Publications

- [C7] **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. Smith. “*StreetNav: Leveraging Street Cameras to Support Precise Outdoor Navigation for Blind Pedestrians*” in ArXiv (under review at **CHI 2024**). [PDF](#)
- [C6] **G. Jain**, B. Hindi, C. Courtien, C. Wyrick, X. Xu, M. Malcolm, B. 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](#)
- [C5] **G. Jain**, Y. Teng, D. Cho, Y. Xing, M. Aziz, B. 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**
- [C4] 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](#)
- [C3] **G. Jain***, S. Chopra*, S. Chopra*, A. S. Parihar. “*Attention-Net: An Ensemble Sketch Recognition Approach using Vector Images*” in IEEE Transactions on Cognitive and Developmental Systems, 2020. [PDF](#)
- [C2] **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 Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 2020. [PDF](#)
 **Among Most Popular Articles: Top 10 in Mar 2020, Top 30 in Dec 2020, and Top 40 in Feb 2021**
- [C1] G. S. Walia, **G. Jain**, N. Bansal, K. Singh. “*Adaptive Weighted Graph Approach to Generate Multimodal Cancelable Biometric Templates*” in IEEE Transactions on Information Forensics and Security, 2020. [PDF](#)

Peer Reviewed Posters and Demos

- [P3] **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. 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](#)
- [P2] **G. Jain**, B. Hindi, C. Courtien, C. Wyrick, X. Xu, M. Malcolm, B. 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](#)
- [P1] **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 & Internships

Columbia University , New York, USA Graduate Research Assistant <i>Led research projects and mentored 20+ graduate and undergraduate students.</i>	Sep 2020 – Present
Université Clermont Auvergne , Clermont-Ferrand, France Research Intern <i>Generated synthetic data for 2D/3D registration in laparoscopic surgery guidance.</i>	Jun 2020 – Jul 2020
Delhi Technological University , New Delhi, India Research Assistant <i>Designed and implemented a Transformer-based network for sketch recognition.</i>	Jan 2019 – May 2020
Indian Institute of Technology , New Delhi, India Research Intern <i>Developed a network for scale-invariant breast cancer detection from mammograms.</i>	Sep 2018 – Feb 2020
Indian Institute of Sciences , Bangalore, India Summer Research Fellow <i>Developed a network for sinogram super-resolution for photoacoustic tomography.</i>	May 2019 – Aug 2019
Defense Research & Development Organization , New Delhi, India Research Assistant <i>Designed a graph fusion approach for a cancelable multimodal biometric system.</i>	Feb 2018 – Nov 2019

Awards & Recognitions

Impact Recognition Award , ACM CSCW 2023 <i>[C5] recognized for its clear potential to demonstrate real-world impact (details).</i>	2023
Professional Development Scholarship , Columbia University <i>Travel support to present paper at CHI 2023 (details).</i>	2023
Gary Marsden Travel Award , ACM SIGCHI <i>Registration fee covered to present paper at CHI 2023 (details).</i>	2023
Greenwoods Fellowship , Columbia University <i>Funding to cover tuition fee and research assistant stipend (details).</i>	2020

Research Excellence Award , Delhi Technological University <i>Recognized for publishing research at journals with high impact factors.</i>	2020, 2021
Summer Research Fellowship , Indian Academy of Sciences <i>Funded summer internship at the Indian Institute of Science, Bangalore.</i>	2019

Selected Press Coverage

Creating tools to help people with vision impairments navigate the world Columbia University, Voices of CS: Gaurav Jain	2023
Clearing the Way: Using AI to help blind and low vision users 'see' Columbia University, Columbia Engineering Magazine	2021

Invited Talks & Lectures

Vision Zero Research on the Road Symposium , New York City Government (details) <i>Leveraging street cameras to support precise outdoor navigation for blind pedestrians.</i>	Nov. 2023
Guest Lecture, COMS E6178: HCI Research Seminar , Columbia University <i>Giving effective research presentations.</i>	Feb. 2023

Community & Professional Services

External Reviewer UIST 2023 CHI 2021, 2023, 2024* ASSETS 2023 CSCW 2022, 2023, 2024* IMWUT 2024 *Special Recognition for Outstanding Reviews	2021 – Present
Student Volunteer ASSETS 2023	2023 – Present
Women in Science (WISC) Mentoring Program , Barnard University <i>Mentored undergraduates to help prepare a roadmap toward their career goals.</i>	2022
Pre-Submission Application Review Program , Columbia University <i>Advised PhD applicants from underrepresented backgrounds.</i>	2020

Teaching & Research Mentoring Experience

Teaching Assistant , Columbia University COMS W4170: <i>User Interface Design</i> COMS E6178: <i>Human-Computer Interaction (Research Seminar)</i>	Fall 2021/22/23 Spring 2021/22/23
Amazon SURE Program Mentor , Columbia University & Amazon Inc. <i>Mentored visiting undergraduates on research projects (details).</i> Conrad Wyrick (<i>University of Florida</i>) Maryam Aziz (<i>University of Connecticut</i>) Dan Weiner (<i>Lehman College, CUNY</i>)	2022/23

XR Access REU Program Mentor, National Science Foundation
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*)

2022/23

Mentor, VISIONS services for the blind and visually impaired
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*)

2020 – Present

Research Lead, Columbia University
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, Arjun Nichani, Mingyu Xie, Basel Hindi,
Yuanyang Teng, David Cho, Yunhao Xing.

2020 – Present

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.