

Gaurav Jain

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https://gaurav1302.github.io/

Research Areas



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

Education

Ph.D. in Computer Science Columbia University, USA Advisor: Brian A. Smith	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 2023 (under submission). [PDF](#)
- [C6] **G. Jain**, B. Hindi, C. Courtien, C. Wyrick, X. Xu, M. Malcolm, B. Smith. “*Front Row: Automatically Generating Immersive Audio Representations of Sports 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>Paper [C5] won the award for its clear potential to demonstrate real-world or practical 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

Community & Professional Services

External Reviewer UIST 2023 CHI 2021, 2023, 2024 ASSETS 2023 CSCW 2022, 2023, 2024 IMWUT 2024	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 <i>Mentored visiting undergraduates on accessibility research (details).</i> Xinyi Xu (<i>Pomona College</i>) Sophie Ana Paris (<i>NYU</i>) Chloe Tedjo (<i>Texas A&M University</i>) Josh Bassin (<i>Penn State University</i>)	2022/23
VISIONS Mentor , services for the blind and visually impaired <i>Co-designing solutions with and mentoring blind & low-vision students (details).</i> Michael Malcolm (<i>SUNY at Albany</i>)	2020 – Present

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, Arjun Nichani, Mingyu Xie, Basel Hindi,
Yuanyang Teng, David Cho, Yunhao Xing.

Skills

Proficient with C, C++, Python (TensorFlow, PyTorch, Keras, OpenCV), MATLAB, LATEX, Linux, Robot Operating System (ROS), Swift, Unity, Balsamiq, Figma, AWS Mechanical Turk, Affinity Photo.

Familiar with R, Hive, Cloudera, Docker, Blender, Paraview, HTML, CSS, Javascript.