

# Gaurav Jain

gaurav@cs.columbia.edu  
https://gaurav1302.github.io/

## Research Areas

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

## Education



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

## Publications

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### Full Conference and Journal Publications

- [7] **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](#)
- [6] **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 '23**). [PDF](#)
- [5] **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 '23**).  *Impact Recognition Award*. [PDF](#)
- [4] 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](#)
- [3] **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](#)
- [2] **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 50 in Sep 2020, Top 30 in Dec 2020, and Top 40 in Feb 2021.*
- [1] 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

- [3] **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 '23**). [PDF](#)
- [2] **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 '23**). [PDF](#)
- [1] **G. Jain\***, S. Chopra\*, S. Chopra\*, A. S. 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

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<b>Columbia University</b> , New York, USA Graduate Research Assistant <i>Led research projects and mentored 15+ graduate and undergraduate students.</i>	Sep 2020 – Present
<b>Université Clermont Auvergne</b> , Clermont-Ferrand, France Research Intern <i>Generated synthetic data for 2D/3D registration in laparoscopic surgery guidance.</i>	Jun 2020 – Jul 2020
<b>Delhi Technological University</b> , New Delhi, India Research Assistant <i>Designed and implemented a Transformer-based network for sketch recognition.</i>	Jan 2019 – May 2020
<b>Indian Institute of Technology</b> , New Delhi, India Research Intern <i>Developed a network for scale-invariant breast cancer detection from mammograms.</i>	Sep 2018 – Feb 2020
<b>Indian Institute of Sciences</b> , Bangalore, India Summer Research Fellow <i>Developed a network for sinogram super-resolution for photoacoustic tomography.</i>	May 2019 – Aug 2019
<b>Defense Research &amp; Development Organization</b> , New Delhi, India Research Assistant <i>Designed a graph fusion approach for a cancelable multimodal biometric system.</i>	Feb 2018 – Nov 2019

## Awards & Recognitions

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<b>Impact Recognition Award</b> , ACM CSCW 2023 <i>"I Want to Figure Things Out": Supporting Exploration in Navigation for Visually Impaired (<a href="#">details</a>).</i>	2023
<b>Professional Development Scholarship</b> , Columbia University <i>Travel support to present paper at CHI 2023 (<a href="#">details</a>).</i>	2023
<b>Gary Marsden Travel Award</b> , ACM SIGCHI <i>Registration fee covered to present paper at CHI 2023 (<a href="#">details</a>).</i>	2023
<b>Greenwoods Fellowship</b> , Columbia University <i>Funding to cover tuition fee and research assistant stipend (<a href="#">details</a>).</i>	2020

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

## Selected Press Coverage

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<b>Creating tools to help people with vision impairments navigate the world</b> Columbia University, <a href="#">Voices of CS: Gaurav Jain</a>	2023
<b>Clearing the Way: Using AI to help blind and low vision users 'see'</b> Columbia University, <a href="#">Columbia Engineering Magazine</a>	2021

## Community & Professional Services

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

## Teaching & Research Mentoring Experience

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<b>Teaching Assistant</b> , 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
<b>Amazon SURE Program Mentor</b> , Columbia University & Amazon Inc. <i>Mentored visiting undergraduates on research projects (<a href="#">details</a>).</i> Conrad Wyrick ( <i>University of Florida</i> ) Maryam Aziz ( <i>University of Connecticut</i> ) Dan Weiner ( <i>Lehman College, CUNY</i> )	2022/23
<b>XR Access REU Program Mentor</b> , National Science Foundation <i>Mentored visiting undergraduates on accessibility research (<a href="#">details</a>).</i> Xinyi Xu ( <i>Pomona College</i> ) Sophie Ana Paris ( <i>NYU</i> ) Chloe Tedjo ( <i>Texas A&amp;M University</i> ) Josh Bassin ( <i>Penn State University</i> )	2022/23
<b>VISIONS Mentor</b> , services for the blind and visually impaired <i>Co-designing solutions with and mentoring blind &amp; low-vision students (<a href="#">details</a>).</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

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*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.*