Mansi Agarwal

E-Mail | LinkedIn | Google Scholar | Website

Embodied AI researcher focused on real-time vision, multimodal learning, and scalable deployment.

Impact Summary

- **$26M+ in annual savings** through deployed AI systems at Amazon Robotics.
- **10 peer-reviewed publications** in top venues (RSS, AAAI, CoRL, InterSpeech) with **90+ citations**.
- **Led and mentored 20+ researchers** in academic labs and industry teams.
- **Bridged research and deployment** in real-world systems across robotics, education, and human-AI interaction.

Work Experience

Applied Scientist October 2023 - Present
Amazon Robotics, Westborough, MA, USA

- Designed a **multi-sensor item identification** system for cluttered warehouse scenes, improving scan speed by **0.66s**.
- Deployed at **300+ stations**, saving **$17M/year**; preferred by station associates and named 2024's top team impact.
- **Patent** in progress for the system's scalable design and $1B+ cost-saving potential across global sites.

Applied Science Intern May 2022 - August 2022
Amazon Robotics, Westborough, MA, USA

- Reduced annotation pipeline time by 12% via **intelligent task allocation** system (**$9.2M/year savings**).

Select Research Experience

Robots Perceiving and Doing Lab, Carnegie Mellon University, USA September 2021 - August 2023
Graduate Research Assistant

- Developed HAC-Cloth, an **RL-based cloth manipulation** system using **point clouds**; **54 times faster** than SoTA.
- Achieved near-perfect folding and smoothing **without subgoals** using correspondence-driven long-horizon planning.
- Published at **RSS 2023** and MSR Thesis, 2023; highlighted scalable correspondence learning.

Multimodal Digital Media Analysis Lab, IIIT Delhi, India May 2020 – July 2021
Research Assistant, New Delhi, India

- Deployed an **AI-powered facial retrieval system** for **Delhi Police**, **6× faster** than prior SoTA (ACMM'21).
- Led a 14-member interdisciplinary team; validated via user studies for **real-time crime investigation use**.
- Leveraged **contrastive learning** and feedback loops for improved personalization and search efficiency.

RoboTutor, Carnegie Mellon University, USA June 2019 - May 2021
Robotics Summer Scholar and Research Intern

- Trained a **time-series model** predicting disengagement before 60% task completion; **Finalist** at AAAI SA 2021.
- Modeled an **affective state detection** system using **semi-supervised learning**, beating SoTA by 27% (EAAI 2020).
- Enabled adaptive tutoring responses using real-world tablet data from young learners in low-resource education settings.

Multimodal Digital Media Analysis Lab, IIIT Delhi, India August 2018 – May 2020
Research Intern

- Proposed a **multimodal learning** approach for crisis severity prediction; surpassed unimodal baselines **(AAAI 2020)**.
- Boosted emotion detection accuracy by 16% using **graph neural networks** over user history and network structure.
- Designed speaker-independent **speech reconstruction model**, improving intelligibility by 22% **(InterSpeech 2019)**.
- Engineered video summarization model with 15% accuracy gain on benchmarks (IEEE BigMM 2019).

Education

Masters of Science in Robotics, School of Computer Science August 2021 – August 2023
Carnegie Mellon University Pittsburgh, PA, USA

- **GPA:** 4.17/4.00 | **Thesis:** *Unfolding the Potential of Point-Based Correspondences for Cloth Manipulation*

Bachelor of Technology in Computer Science and Engineering August 2016 – May 2020
Delhi Technological University New Delhi, India

- **GPA:** 9.46/10.00 | **Thesis:** *Towards Multimodal Damage Analysis: Deployment, Challenges, and Assessment*

Key Publications

Authored 10 peer-reviewed papers; research cited 90+ times. Full publication list available on Google Scholar.

- **Agarwal** et al., Point-based Correspondence Estimation for Cloth Alignment, **RSS 2023** [PDF]
- **Agarwal** et al., Early Prediction of Task Completion using Visual Features, **AAAI 2021** [PDF] (Finalist Paper)
- **Agarwal** et al., Crisis-DIAS: Towards Multimodal Damage Analysis, **AAAI 2020** [PDF]
- **Agarwal** et al., Semi-supervised Learning to Perceive Children's Affective States, **EAAI 2020** [PDF]

Technical & Research Skills

- **Research Areas**: Perception, Self-Supervised & Multimodal Learning, Learning-Based Planning, Embodied AI
- **Programming**: Python, C, C++ | **Robotics/Vision Tools**: OpenCV, CUDA, Softgym
- **ML/DL Frameworks**: PyTorch (Lightning, Geometric, 3D), TensorFlow

Awards, Honors & Service

- **Microsoft Research, ACM-W, and ECIR Travel Grant**, for presenting at AAAI and ECIR, 2020.
- **S.N. Bose Scholarship**, Govt. of India, 2.5% acceptance rate, 2019.
- **Robotics Institute Summer Scholar**, Carnegie Mellon University, 3% acceptance rate, 2019.
- **Gold Medalist**, for academics, 2016.
- **Reviewer**, AAAI, CVPR, 2020; **Admissions Committee Member**, CMU RISS, 2022.

Leadership & Outreach

- **Panelist**, Diversity and Inclusion for Everyone, CVPR, 2024; **Technical talks** at UPenn, U. Toronto, 2024.
- **Mentor**, CLIMB, DTU: Mentored female engineers, provided career guidance.
- **STEM Educator**, Teach for India: Designed and conducted STEM curriculum for 50 middle-school girls.