

Bhuvan Sachdeva

Research Fellow, Sankara Eye Hospital and Microsoft Research

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Education

May 2023 Aug 2019	Delhi Technological University (DTU) B.Tech - Computer Science and Engineering, GPA: 9.2/10	Delhi, India
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Experience

Present Aug 2023	Sankara Eye Hospital Microsoft Research <i>Research Fellow Advisors: Dr. Mohit Jain, Dr. Kaushik Murali</i> Working on automated analysis of cataract surgeries to improve surgical outcomes and building chatbots for healthcare to assist patients and community healthworkers.	Bangalore, India
Mar 2023 Sept 2022	Kroop AI <i>Research Intern Advisor: Prof. Abhinav Dhall</i> Developed facial expression transfer for avatars and deepfake detection using facial landmarks.	Remote
July 2022 May 2019	Prime Video, Amazon <i>Applied Scientist Intern Advisor: Dr. Anil Nelakanti</i> Improved machine translation for Prime Video system using Automatic Post Editing.	Bangalore, India
Apr 2022 June 2021	Kroop AI <i>Research Intern Advisor: Prof. Abhinav Dhall</i> Worked on projects involving face swapping, voice cloning and generating lip movements from audio.	Remote

Select Publications

S=Under Review, C=Conference, W=Workshop, P=Poster/Demo, J=Journal

- [C.2] **Phase-Informed Tool Segmentation for Manual Small-Incision Cataract Surgery** [🔗]
Bhuvan Sachdeva*, Naren Akash*, Tajamul Ashraf, Simon Mueller, Thomas Schultz, Maximilian WM Wintergerst, Niharika Singri Prasad, Kaushik Murali, Mohit Jain
International Conference on Medical Image Computing and Computer Assisted Intervention [MICCAI'25]
- [J.3] **CataractBot: An LLM-Powered Expert-in-the-Loop Chatbot for Cataract Patients** [🔗]
Bhuvan Sachdeva*, Pragnya Ramjee*, Satvik Golechha, Shreyas Kulkarni, Geeta Fulari, Kaushik Murali, Mohit Jain
Proc. ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies [ACM IMWUT'25]
- [C.1] **ASHABot: An LLM-Powered Chatbot to Support the Informational Needs of Community Health Workers** [🔗]
Pragnya Ramjee, Mehak Chhokar, Bhuvan Sachdeva, Mahendra Meena, Hamid Abdullah, Aditya Vashistha, Ruchit Nagar, Mohit Jain
ACM Conference on Human Factors in Computing Systems [CHI'25]
- [S.1] **Learnings from a Large-Scale Deployment of an LLM-Powered Expert-in-the-Loop Healthcare Chatbot** [🔗]
Bhuvan Sachdeva*, Pragnya Ramjee*, Geeta Fulari, Kaushik Murali, Mohit Jain
[Under Review]

Select Research Projects

Surgical Anomaly Detection <i>Advisors: Dr. Mohit Jain, Dr. Kaushik Murali</i> > Curated a dataset of 400 videos for Manual Small-Incision Cataract Surgery (MSICS) from conventional and smartphone-based systems at Sankara Eye Hospital . > Built a SAM-based web application for surgical instrument labeling, deployed on Azure. > Utilized a conditional decoder and semi-supervised setup to improve tool segmentation ; results under submission. > Currently integrating surgical priors with detected phases and tools for anomaly detection .	Sankara Eye Hospital Microsoft Research, Aug'23 - Present
Machine Translation for Conversational Data <i>Advisor: Dr. Anil Nelakanti</i> > Improved machine translation for conversational data using Automatic Post Editing (APE) . > Developed novel transformer decoder methods, achieving 5% higher BLEU scores on the Flores dataset .	Amazon, May'22 - July'22

Advisor: [Dr. Mohit Jain](#)

- > Developed an **expert-in-the-loop chatbot** framework using Python, supporting **multilingual** and **multi-modal** queries in **Indic** languages.
- > Implemented a **Retrieval-Augmented Generation (RAG)** pipeline for expert-curated query responses.
- > Open-sourced the framework via Microsoft at [BYOeB](#), adopted by multiple hospitals and organizations, including **CataractBot** and **ASHABot**.
- > **CataractBot** has been used by over **500 cataract patients** at Sankara Eye Hospital and **ASHABot** has been used by over **700 ASHAs and 100 ANMs** in Rajasthan.

Honours and Awards

Secured Rank 98 in Amritapuri Prelims, ACM ICPC, 2020 ACM ICPC, Amritapuri Prelims, 2020

Ranked 309 out of 7400 participants in Google Kickstart Round B, 2021 Google Kickstart, 2021

Candidate Master on Codeforces: [_bhuvan21](#) Codeforces

Selected for Amazon Machine Learning Summer School, 2021 and 2022 Amazon ML Summer School, 2021, 2022

Selected for Microsoft Engage Mentorship Program, 2021 Microsoft Engage, 2021

Other Publications

S=In Submission, C=Conference, W=Workshop, P=Poster/Demo, J=Journal

- [J.2] **Phase recognition in manual Small-Incision cataract surgery with MS-TCN++ on the novel SICS-105 dataset** [🔗]
 Simon Mueller, [Bhuvan Sachdeva](#), Singri Niharika Prasad, Raphael Lechtenboehmer, Frank G Holz, Robert P Finger, Kaushik Murali, Mohit Jain, Maximilian WM Wintergerst, Thomas Schultz
Nature Scientific Reports [Scientific Reports]
- [J.1] **Artificial Intelligence in Cataract Surgery: A Systematic Review** [🔗]
 Simon Müller, Mohit Jain, [Bhuvan Sachdeva](#), Payal N Shah, Frank G Holz, Robert P Finger, Kaushik Murali, Maximilian WM Wintergerst, Thomas Schultz
Translational Vision Science & Technology [TVST'24]

Teaching and Volunteering Roles

- Sankara Eye Hospital** Sep'23 - Nov'23
 > Delivered an *Introduction to AI* course to second-year Ophthalmology fellows, simplifying complex concepts for a medical audience.
- The Indian Game Theory Society, DTU** Technical Co-Head Dec'20 - May'22
 > Conducted academic sessions on advanced topics in Game Theory, fostering learning and collaboration.
 > Authored and contributed to technical blogs for the society's online publication.
- Make A Difference (MAD) NGO** Fundamental Support Volunteer Nov'19 - Jun'20
 > Mentored and taught underprivileged children in a government-run center, focusing on their holistic development.

References

- > Dr. Mohit Jain Principal Researcher, Microsoft Research, India [🔗]
- > Dr. Kaushik Murali President Medical Administration, Sankara Eye Hospital [🔗]
- > Dr. Anil Nelakanti Lead Machine Learning Scientist, Amazon, India [🔗]