Roshni **Poddar**

Research Fellow, Microsoft Research India

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Education

Aug 2018 – May 2022 | **PES UNIVERSITY (RR CAMPUS)** — **Bangalore, India**
B.Tech, Computer Science & Engineering
CGPA: 9.17 out of 10

Research Interests

My research interests lie at the intersection of **Human-Computer Interaction (HCI) and accessibility**. I am interested in **co-designing with marginalised communities with disabilities to build and evaluate systems** that promote **learning, creativity, play, and mixed-ability collaboration** and am excited to leverage recent technologies like **generative AI** for this purpose. I firmly believe that we need to consider the **impact of factors such as race, stigma, socioeconomic status, and infrastructure** to conduct more inclusive accessibility research.

Experience

Jul 2022 – Present | **Microsoft Research India | Technology and Empowerment (TEM)** [🌐] — **Bangalore, India**
Research Fellow | Advisors: Dr. Manohar Swaminathan, Dr. Mohit Jain, Dr. Pratyush Kumar
Working on research problems around Human-computer Interaction (HCI) and accessibility in the Global South, specifically in the context of *learning*, *play*, and *videoconferencing for mixed hearing groups*.

Jan 2022
Research Intern | Advisors: Dr. Manohar Swaminathan, Dr. Mohit Jain, Dr. Pratyush Kumar
Developed a sign language-based Android quiz app, inspired by Kahoot!, co-designed with the DHH community. Conducted a mixed-method study with 20 Indian Deaf and Hard-of-Hearing participants to understand the usability, gameplay behavior, social interaction, and learning aspects of the app.

August 2020 – Dec 2021 | **AI4Bharat**
Research Intern | Advisor: Dr. Pratyush Kumar
Worked on isolated sign language recognition using deep learning and a mixed-methods study to understand the challenges faced by the employed Deaf and Hard of Hearing (DHH) community in India.

April 2020 – June 2020 | **Cloud Computing and Big Data Research Center, PES University**
Intern
Configured NextCloud software to help collaboration between administration, faculty, and students while keeping privacy as a priority.

Publications

S=In Submission, C=Conference, P=Poster/Demo

[P.1] SignIt! An Android Game for Sign Bilingual Play [🔗]
Roshni Poddar*, Pradyumna YM*, Divya PJ, Tarini N, Punyat T, Nabeel TP, Hemanth RY, Pratyush K, Mohit J, Manohar S (* = Equal Contribution)
The 25th International ACM SIGACCESS Conference on Computers and Accessibility [**ASSETS'23**]

[C.3] SignIt! An Android Game for Sign Bilingual Play that collects Labelled Sign Language Data
Roshni Poddar*, Pradyumna YM*, Divya PJ, Tarini N, Punyat T, Nabeel TP, Hemanth RY, Pratyush K, Mohit J, Manohar S (* = Equal Contribution)
To appear at ITU Journal on Future and Evolving Technologies [**ITU'23**]

[C.2] Jod: Examining Design and Implementation of a Videoconferencing Platform for Mixed Hearing Groups [🔗]
Anant M, Meghna G, Roshni Poddar, Tarini N, SeethaLakshmi K, James F, Pratyush K, Mohit J
The 25th International ACM SIGACCESS Conference on Computers and Accessibility [**ASSETS'23**]

[C.1] Challenges faced by the Employed Indian DHH Community [🔗]
Advaith Sridhar, Roshni Poddar, Mohit Jain, Pratyush Kumar
Proceedings of the 19th IFIP TC13 International Conference on Human-Computer Interaction (INTERACT) [**INTERACT'23**]

Selected Research Projects

An educational experiences delivery system for blind and low vision (BLV) children Jan'23 - Present

- Developed the Android app that facilitates the experiences over a group call with a teacher and their students. I iteratively improved the user experience of using the app through TalkBack through feedback from BLV teachers having varying smartphone proficiency.
- Visited two schools for the blind in Bangalore every week for about eight months to introduce the project to children and refine the components of this project.
- Exhibited the SEEDS project at the EMPOWER 2022 conference.
- Conducted a study with 5 facilitators and 29 children across Karnataka during their summer vacations. I responded to the system failures during the sessions. Conducted semi-structured interviews with the facilitators to understand their experience and challenges during the pilot. Currently analysing the interviews and usage logs from the app. [**Working Paper**]

An Android Game for Indian sign language and English learning Jan'22 - Jan'23

- Co-developed and iteratively improved the Android app based on the feedback from our team consisting of 6 DHH interns, 2 researchers, and 2 designers.
- Led the design and execution of a mixed methods study involving a survey and semi-structured interview of 20 DHH participants to understand the usability of the app. [**Initial part of the study is a Poster at ASSETS'23**][**ITU Journal'23**]

Designing Accessible Video Conferencing Platforms for mixed hearing groups Sep'22 - Dec'22

- Worked with Anant Mittal (PhD student) on building an accessible video conferencing prototype for mixed hearing groups.
- Conducted in-person user studies and focus group discussions with 18 DHH, 6 interpreters, and 10 hearing participants. [**ASSETS'23**]

Understanding the challenges faced by the Employed Deaf and Hard-of-Hearing community in India Dec'20 - Dec'21

- Worked on a mixed-method study to understand the challenges faced by the Employed Deaf and Hard-of-Hearing community in India to gauge the effectiveness of the widespread intent to increase inclusion in workplaces and to establish the state of early adoption of technology.
- Conducted seven semi-structured interviews; analysed 131 survey responses and 15 semi-structured interviews using inductive thematic analysis. [**INTERACT'23**]

Isolated sign language recognition (ISLR) as part of Microsoft's AI For Accessibility Grant Aug'20 - Dec'20

- Compared the accuracy between different open-source pose estimation models.
- I utilized the MediaPipe framework to extract features from an Indian Sign Language dataset. I then trained several machine learning models using these features and evaluated their performance in terms of accuracy and inference speed for isolated sign language recognition.
- Achieved 83.27% accuracy on ISLR task on a dataset containing 4,287 videos over 263 word signs from 15 different word categories. Open-sourced the code for isolated sign language recognition.
- Assisted with developing an Azure bot that joins Microsoft Teams meetings and transcribes the words signed by a person in the meeting chat using the ISLR model.

Selected Software Projects

A quiz website for blind and low vision (BLV) students Jan'21 - Dec'22

- Developed a user-friendly React.js website for blind and low vision (BLV) students to take quizzes on Science and Math topics. These quizzes were either system-generated or created by teachers (who may also be BLV).
- Manually curated a database of questions for sixth grade Science and math syllabus to ensure they are accessible through screen readers.
- Received feedback from two BLV students regarding the usability of the website.

Generic Iterable Fibonacci Heap Mar'21 - April'21

› Wrote a Fibonacci heap using generics and constructed an iterator for the same such that the data structure works with the appropriate functions defined in the C++ STL algorithm library.

Automated News Aggregator with Sentiment Analysis Aug'2020 - Nov'2020

› An automated news aggregator that exposes bias in news articles and mirrors public opinion with statistics using sentiment analysis.

Football Premier League Analysis Using PySpark Nov'20 - Dec'20

› Simulated the football Premier League through data streaming in PySpark. Calculated various relevant metrics in real-time and predicted the winner of the match.

Skills

Research Methods	System building, Co-design, Semi-structured Interviews, Survey, Observations, Usability Evaluation, Iterative prototyping
Design Tools	Figma (Beginner)
Programming Languages	Kotlin (Expert), Python (Expert), JavaScript (Expert), C++ (Intermediate), C(Intermediate)
Frameworks	React (Expert), Flutter (Beginner), Pytorch (Intermediate), Tensorflow (Beginner)

Honours and Awards

Prof. CNR Rao Scholarship Awarded merit scholarships for outstanding academic performance during my undergraduate studies

Microsoft Global Hackathon, 2022. Won third place in two categories - Hack 2 enable and Hack for Society