Chitralekha Gupta, Senior Research Fellow

Contact Information

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Research Interests

- Human–AI interaction and cognitive augmentation through wearable and auditory feedback
- Explainable AI for pathological and impaired speech analysis
- Assistive audio technologies and sonic interaction design for accessibility
- Real-world audio intelligence for UAVs
- Controllable and generative models for creative and assistive audio applications

Current Position

Senior Research Fellow, *Dept. of Computer Science, NUS* 2023–Present

- Explore AI+X systems enhancing human perception and cognition (e.g., wearable fact-checking, interactive language learning)
- Lead research on audio intelligence systems for drones and assistive technologies
- Design temporal explainability frameworks for pathological speech analysis
- Develop controllable audio generative models using GANs and diffusion models

Prior Work Experience

Research Fellow, NUS 2019–2023
(PIs: Suranga Nanayakkara, Lonce Wyse, Haizhou Li)

- Developed top-ranked lyrics alignment and transcription systems (MIREX 2019–2020)
- Designed explainable AI models for singing and speech quality assessment
- Collaborated with Meta Platforms on VR experiences, and assistive audio generation

Co-Founder, MuSigPro Pte. Ltd. 2019–2025
Commercialized AI music technologies including singing quality and lyrics alignment systems

Research Engineer, Airbus Defence & Space, Bangalore 2013–2014

Software Developer, Dell R&D, Bangalore 2011–2013

Education

Ph.D., Computer Science, **National University of Singapore** 2015–2019
Thesis: Comprehensive Evaluation of Singing Quality *CAP:* 4.38/5.0
Advisors: Haizhou Li, Ye Wang

M.Tech., Electrical Engineering, **IIT Bombay**, India 2008–2011
Thesis: Objective Assessment of Ornaments in Indian Singing *GPA:* 9.63/10.0
Advisor: Preeti Rao

B.E., Electronics Engineering, M.S. University, Baroda, India 2004–2008

Key Research Contributions

- **Fact-Nudger (2025–Present):** A wearable fact-checking paradigm to analyse the effects of nudges on human cognitive abilities. (*CHI 2026 under review, Workshop paper and Demo at CHI 2025*)
- **Explainable AI for Pathological Speech (2024–Present):** Temporal explainability framework for dysarthric speech clarity – Collaboration with Alexandra Hospital Singapore. (*INTERSPEECH 2025*)
- **Assistive Audio Technologies (2023–2025):** Created *SonicVista*, an assistive sonification tool for the visually impaired – Collaboration with Singapore Association for the Visually Handicapped. (*CHI 2025, IMWUT 2024*)

- **Drone Audio Intelligence (2024–Present):** Benchmark dataset and noise-robust pipeline for UAV-mounted microphone arrays. (*NeurIPS 2025*)
- **Controllable Audio Generation (2021–2024):** Developed label-, example-, and text-based control mechanisms for generative audio models. (*ICASSP, ISMIR, IEEE/ACM TASLP*)

Selected Publications

- **C. Gupta**, N. Aritonang, D. Daniel, V. Danry, P. Maes, S. Nanayakkara, *Feeling the Facts: Real-time Wearable Fact-checkers Can Use Nudges to Reduce User Belief in False Information*, CHI 2026.
- **C. Gupta**, J. Peng, A. Ram, S. Sridhar, C. Jouffrais, and S. Nanayakkara, *Beyond Descriptions: A Generative Scene2Audio Framework for Blind and Low-Vision Users to Experience Vista Landscapes*, CHI 2026.
- **C. Gupta**, S. Ramesh, P. Sasikumar, K.P. Yeo, S. Nanayakkara, *DroneAudioset: An Audio Dataset for Drone Audition-based Search and Rescue*, NeurIPS 2025.
- **C. Gupta**, S. Park, M. Kwan, X. Fung, A. Yip, S. Nanayakkara, *Towards Temporally Explainable Dysarthric Speech Clarity Assessment*, INTERSPEECH 2025.
- **C. Gupta**, A. Ram, S. Sridhar, C. Jouffrais, S. Nanayakkara, *Scene-to-Audio: Distant Scene Sonification for Blind and Low Vision People*, ACM CHI-EA 2025.
- **C. Gupta**, S. Sridhar, D. Mattheis, C. Jouffrais, S. Nanayakkara, *SonicVista: Creating Awareness of Distant Scenes through Sonification*, ACM IMWUT/UbiComp 2024.
- E. Wen, **C. Gupta**, P. Sasikumar, M. Billinghurst, J. Wilmott, E. Skow, A. Dey, S. Nanayakkara, *VR.net: Dataset for VR Motion Sickness Research*, IEEE VR 2024. **(Best Paper Award)**
- **C. Gupta**, P. Kamath, Y. Wei, Z. Li, S. Nanayakkara, L. Wyse, *Towards Controllable Audio Texture Morphing*, ICASSP 2023.
- **C. Gupta**, H. Li, M. Goto, *Deep Learning Approaches in Singing Information Processing*, IEEE/ACM TASLP 2022.
- **C. Gupta**, E. Ylmaz, H. Li, *Automatic Lyrics Alignment and Transcription in Polyphonic Music: Does Background Music Help?*, ICASSP 2020.

Collaborations

- MIT Media Lab, USA — 2025 – Present
- CNRS, Toulouse, France — 2023 – Present
- Alexandra Hospital, Singapore — 2024 – Present
- Meta Platforms Inc. (Meta), USA — 2022 – 2024
- AIST, Japan — 2021 – 2022

Leadership and Awards

- **Innovation Fellow Award 2025:** For research excellence and translation in AI for Audio Applications (NUS Enterprise). Grant: SGD 160K.
- **Best Paper Awards:** IEEE VR 2024, APSIPA ASC 2017
- **DCASE Challenge 2023:** 3rd place, Foley Sound Synthesis (26 teams)
- **MIREX 2020–2019:** 1st place, Lyrics Alignment and Transcription
- **Research Leadership:** Mentored 2 PhD and 3 Masters students (graduated).
- **Innovation Venture Grant:** Graduate Research Innovation Program for MuSigPro (SGD 100K)

Patents

- **US Patent 11,972,774:** System for Assessing Singing Voice Quality (2024)
- **SG Patent Pending:** AI-generated sounds for scene understanding (2024)
- **SG Patent Pending:** Fine-grained controllable audio morphing (2025)