

# Disha Sardana

Individual Interdisciplinary Ph.D.

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## EXPERIENCE

### IMMERSIVE ANALYTICS

DEMO | CREATIVITY + INNOVATION DAY-ARTICLE | STUDENT SPOTLIGHT  
Jan 2019 – May 2023 | Center for Human-Computer Interaction (CHCI) at VT

- Developed an approach for embodied data exploration of multi-dimensional datasets in an immersive **mixed reality (MR)** environment using HoloLens 2
- Conducted a research study with 34 participants to evaluate the strengths and limitations of analyzing data in a 3D immersive environment compared to a non-immersive desktop environment based on specific visual analytics tasks
- Studied the effect of **frame of reference** on user understanding and interaction with data in an immersive analytics environment by conducting user studies with 20 participants
- Measured the impact of **sonification** on augmenting visual data analysis in an immersive environment by conducting a user study with 55 participants
- Provided **design guidelines** based on the frame of reference and sonification for immersive analytics in MR environments

### SPATIAL AUDIO DATA IMMERSIVE EXPERIENCE (SADIE)

NSF FUNDED PROJECT | WVTF-ARTICLE | VT-NEWS  
Aug 2017 – Jul 2020 | Institute for Creativity, Arts, and Technology (ICAT) at VT

- Conducted in-person user studies with over **150 users** to study the human perception of sound in an immersive multi-layered auditory environment
- Performed hypothesis testing and **statistical analysis** on user data, leading to four publications in prestigious audio-related conferences
- To enable user interaction with immersive sound environments utilizing **motion capture systems**, designed a new motion-tracking glove that allows physical control of a high-density, three-dimensional array of speakers
- Programmed the logic to recognize 3-dimensional gestures (such as pinch, zoom, etc.) from real-time coordinates of various glove elements
- Packaged code into a reusable toolkit that can be deployed in other settings

## SELECTED PUBLICATIONS [FULL LIST]

- Splechtna, R., Hulka, T., **Sardana, D.**, Chandrashekar, N. D., Gracanin, D., & Matkovic, K. (2023). "Interactive Exploration of Complex Heterogeneous Data." In Proceedings of the 18th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (**VISIGRAPP 2023**).
- Ngo A., **Sardana, D.**, & Bukvic, I. I. (2022). "Sonifying 2D Cellular Behavior using Cellular Stethoscope." In Proceedings of the 27th International Conference on Auditory Display (**ICAD 2022**).
- **Sardana, D.**, Kahu, S. Y., Gračanin, D., & Matković, K. (2021). "Multi-modal Data Exploration in a Mixed Reality Environment Using Coordinated Multiple Views." In: Yamamoto S., Mori H. (eds) Human Interface and the Management of Information. Information Presentation and Visualization (**HCI 2021**).
- **Sardana, D.**, Joo, W., Bukvic, I. I., & Earle, G. (2020). "Perception of spatial data properties in an immersive multi-layered auditory environment." In Proceedings of the 15th International Conference on Audio Mostly (**ICAD 2020**).
- **Sardana, D.**, Joo, W., Bukvic, I. I., & Earle, G. (2019). "Introducing Locus: A NIME for immersive exocentric aural environments." In Proceedings of the International Conference on New Interfaces for Musical Expression (**NIME 2019**).

## EDUCATION

### VIRGINIA TECH

PH.D. IN HUMAN-CENTERED DESIGN  
May 2023 | Blacksburg, VA, USA  
Cum. GPA: 3.88 / 4.0

### VIRGINIA TECH

MASTER'S IN ELECTRICAL ENGG.  
May 2018 | Blacksburg, VA, USA  
Cum. GPA: 3.85 / 4.0

## SKILLS

### PROGRAMMING

Proficient:  
Python • R • MATLAB

Familiar:  
C# • Javascript

### TOOLS

Unity3D • Git • Miro • Figma

### RESEARCH

Interviews • Usability Testing •  
Mixed-Methods Research •  
Surveys • Thematic Analysis •  
User Studies • Experimental  
Design • Hypothesis Testing

## LEADERSHIP

• **President** | CHCI Student Council  
• **Co-Founder & VP** | Kala - Indian  
Classical Music Society  
• **President** | Indian Students  
Association at Virginia Tech

## HONORS

• Received honorable mention for  
the **IEEE VAST Challenge 2022**  
• Awarded NSF scholarship for the  
Student ThinkTank at the **ICAD '19**  
• Received a student presentation  
award at the **AMS 98th Annual  
Meeting** for exceptional research &  
presentation  
• Inducted life member of Phi  
Kappa Phi