Disha Sardana

Recently graduated, interdisciplinary Ph.D. at Virginia Tech

disha-sardana.squarespace.com | dishas9 | dishas9@vt.edu | +1(540)449-5353

Experience

IMMERSIVE ANALYTICS

Demo I | Demo II | 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

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** (including t-test and ANOVA) on user data, leading to four publications in prestigious audio-related conferences
- Designed a new motion-tracking glove to enable user interaction with immersive sound environments utilizing **motion capture systems**
- Programmed the logic to recognize 3-dimensional gestures (such as pinch, zoom, etc.) from real-time coordinates of various glove elements

STUDY OF GEOMAGNETIC SOLAR STORMS USING MACHINE LEARNING

Best Presentation Award

Aug 2015 - May 2018 | Center for Space Science and Engineering Research at VT

- Presented a study of large solar storms occurring from 2000-2018 to quantify their effects on the Total Electron Content (TEC) in the ionosphere over the U.S. sector
- Studied the strength of influence of various storm parameters on the TEC using tree-based **machine learning** techniques, such as, random forest
- Used AWS, Python, and Scikit Learn to build a pipeline to fetch and ingest massive amounts of ionospheric data (order of 10s of GBs) to train and test machine learning models
- Work won **student presentation award** at the AMS 98th Annual Meeting (2018)

Selected Publications [Full List on Google Scholar]

- Debchoudhury, S., **Sardana, D.**, & Earle, G. D., "The relative importance of geomagnetic storm signatures on the total electron content perturbations over the continental US," in the **Journal of Geophysical Research: Space Physics, 2021.**
- **Sardana, D.**, Kahu, S. Y., Gračanin, D., & Matković, K., "Multi-modal Data Exploration in a Mixed Reality Environment Using Coordinated Multiple Views," in **HCII 2021**.
- **Sardana, D.**, Joo, W., Bukvic, I. I., & Earle, G., "Perception of spatial data properties in an immersive multi-layered auditory environment," in **ICAD 2020**.
- **Sardana, D.**, "Quantification of Effect of Solar Storms on TEC over US sector Using Machine Learning," **Thesis (2018)**, Virginia Tech.

Education

VIRGINIA TECH

Interdisciplinary Ph.D.

May 2023 | Blacksburg, VA, USA

Cum. GPA: 3.88 / 4.0

VIRGINIA TECH

M.S. in Electrical Engineering

May 2018 | Blacksburg, VA, USA

Cum. GPA: 3.85 / 4.0

Skills

PROGRAMMING

Proficient:
Python • R • MATLAB

Familiar:
C# • Javascript

TOOLS

Unity3D • Git • Visual Studio • Miro • Figma • Max/MSP

RESEARCH

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

Leadership

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

Honors

- Received an 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