NIRMITA MEHRA

HCI Researcher

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EDUCATION

IIIT Delhi

Bachelors in Technology | ECE

Aug 2016 – Dec 2020

- GPA: 7.78/10

Delhi Public School, Mathuraroad

High School

Aug 2014 – May 2016

- CBSE Boards: 94.6%

INTERNSHIPS

Visiting Student

Fluid Interfaces, MIT Media Lab

August 2019 – July 2020 Boston, MA

- Conducted user studies to observe the effect of scent on memory consolidation through a scent prototype.
- Developed a Unity App for breathing exercise with biofeedback.
- Conducted analysis of Physiological data, Subjective data and Language.

Advanced System Technology - Intern

STMicroelectronics

May 2017 – July 2017 Greater Noida, India

- Worked to make Autonomous drones simulations on Unreal Engine. This involved reimplementation of the project Airsim by Microsoft for the initial simulations.

PUBLICATIONS

VirtualBricks: Exploring a Scalable, Modular toolkit for Enabling Physical Manipulation in VR. - *Published at CHI'19*

- Guide: Dr. Aman Parnami , Co-Authors: J. Arora, A. Saini, V. Jain, S. Shrey
- VirtualBricks is a toolkit that enables construction of a variety of physical-manipulation enabled controllers for Virtual Reality. It also provides encapsulated scripts to smoothly integrate the sensors with VR applications.

Targeted Memory Consolidation using scent - *Results included in Judith Amores' PhD Thesis*

- Guide: Pattie Maes
- To study the effect of scent, on physiology and subjective experience, during memorization and further reactivation of memory during sleep using scent.
- The study was conducted with 32 users using a smart scent device, which would be controlled using a smartphone application. The physiological data was obtained from Empatica wristband and Fitbit. The analysis of data involved several tests and signal processing such as: t-test, ANOVA, f-tests etc.

LANGUAGES AND TOOLS

Python | Java | C# | C++ | Unity | MATLAB | Unreal Engine | Unix

PROJECTS

Lotuscent

- Guide: Pattie Maes, Judith Amores
- To study the effect of biofeedback using scent, on physiology and subjective experience, through a comparative design. The scent device detects breathing waveform i.e. inhalation and exhalation and releases scent bursts synchronously during inhalation. The device consisted of IMU, BLE and Piezoelectric transducer. The smartphone app was developed on unity and used thresholding and kalman filter to obtain the waveform.

Fluid Sketching in VR

- To create 3D fluid artworks in VR using controllers. It also allows manipulation of brush and particle properties. The nature of the particles was designed to show fluid properties like diffusion which can be controlled by the user. This was designed on Unity 3D using C and particle system and Leap Motion.

Emotion detection of songs and display through emoticons

- To create a model that predicts the emotions associated with a song and displays emoticons that best represent it. The model analyses the emotions associated with the audio and lyrics and classifies accordingly using Machine Learning Techniques like TF-IDF, Doc2Vec using frequency of part of speech.

Single Image haze removal

- Removal of haze (airlight) from a single image using dark prior channel It involved various image processing techniques to find dark prior, estimate the transmission, refine transmission and further recover the scene radiance.

WORK IN PROGRESS

Design Space Exploration for Reducing Sexual Victimisation using VR Role Plays

- Guide: Aman Parnami , Co-Authors: M. Goel
- We present a VR platform to practice self-defense and get mental training against sexual harassment. We demonstrate 4 applications to practice self-defence. We also provide framework to design more applications of self-defense training with the help of literature and in-person interviews.

HACKATHONS

- **VR/AR Hackathon'20 at MIT:** Selected among top 400 participants from across the world to participate. We designed a multi-user educational AR platform streaming lectures in real-time remotely or in place using Nreal glasses and ARCore based platform.
- **Assistive Technology Hackathon at MIT:** Designed a social networking application for specially abled people for dating and making friends. This platform also used crowdsourced data to suggest places to visit and if it is their disability friendly.

SCHOLARSHIPS

- Travel Grant for attending CHI'19 from INAE (Indian National Academy of Engineering)

LEADERSHIP

- Head of Events, Odyssey'19 (Cultural fest)
- Coordinator, MadToes (Dance Society)
- Member, Women in Tech