Sneha **Bhakare**

MS Student · School of Computing · University of Utah

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Reasearch Interests: Ray Tracing, Virtual Rendering, Augmented Reality, Animation, Rendering, Computer Vision

Education

University of Utah — *August '19 - Present*

M.S. in Computing (Graphics and Visualization Track)

- Relevant Courses: Ray Tracing for Graphics, Virtual Reality, Computer-Aided Geometric Design

Indian Institute of Technology Bombay — *July '15 - May '19*

B.Tech. in Computer Science and Engineering with Honours

- Relevant Courses: Computer Graphics, Advanced Computer Graphics, Medical Image Computing, Digital Image Processing

Research

Coherent Rendering for Augmented Reality [report] — *Aug '18 - April '19*

Undergraduate Thesis under Prof. Parag Chaudhuri

- Estimated the spherical harmonics lighting for a scene with a known arbitrary object (used as lightprobe) using a single CNN
- Trained the CNN on a synthesized training dataset of known arbitrary object with systematic variation of illumination
- Investigated combinations of planes from the environment to use them effectively as a plausible lightprobe

Interactive Decision-making in VR Environments [report] — *Fall 2019*

Research Project under Prof. Rogelio E. Cardona-Rivera

- Investigating the relationship between way of information presentation (active space vs personal space) and decision-making performance within an interactive 3D Virtual Reality environment

Research Implementations & Projects

Ray Tracer [code] — *Fall 2019*

Ray Tracing for Graphics under Prof. Cem Yuksel

- Built a ray tracer using path tracing to shade glossy reflective and refractive surfaces with area lights to simulate soft shadows
- Implemented texture filtering, anti-aliasing, depth of field rendering and BVH acceleration structure to improve performance

Game in Augumented Reality [code] — *Spring 2019*

Advanced Computer Graphics under Prof. Parag Chaudhuri

- Developed a ball in a maze puzzle game controlled by tilting the marker board in AR using ARToolKit 5 and Box2D

3D Graphical Modelling and Animation [video] [code] — *Fall 2018*

Computer Graphics under Prof. Parag Chaudhuri

- Built hierarchical models of 3D characters, added lighting, texture and scripted animation to create a short animation video
- Implemented an interface to create and edit Bezier space curves by clicking control points for camera animation

Archetypal Style Analysis [report] [code] — *Spring 2019*

Advanced Machine Learning under Prof. Sunita Sarawagi

- Derived 32 archetypal styles from 2046 artworks, implemented style transfer and experimented with the quality of stylization

Content Based Image Retrieval [results] [code] — *Fall 2018*

Digital Image Processing under Prof. Suyash Awate

- Built descriptor for image retrieval by extracting orientation features at salient Modified Harris for Edges and Corners keypoints using an improved edge map and tested this method on the THUR15000 and COREL10000 databases

Work Experience

Teaching Assistant

- Computer Graphics by Prof. Ladislav Kavan, University of Utah — *Fall 2019*
- Computer Programming by Prof. Ganesh Ramakrishnan, IIT Bombay — *Spring 2019*
- Computer Programming by Prof. Om Damani, IIT Bombay — *Fall 2018*

Morgan Stanley — *Summer 2018*

- Built an E2E testing framework for an Angular application using Protractor to ease testing and aid debugging
- Developed functionalities to perform automated routines and validate xmlhttprequests in a sandbox environment

Edelweiss Finance and Investment Limited — *Summer 2017*

- Developed application for Breach Report generation for 4 Order Trade Analytic platforms and optimized it at design and implementation level to improve its time performance by 70% using parallel programming and memory mapping