Snehal Padhye

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https://snehalpadhye.github.io

EDUCATION

Doctor of Philosophy, Imaging Science
Rochester Institute of Technology, Rochester, NY
August 2018 - Present
CGPA: 3.69/4

Master of Technology, Signal Processing
College of Engineering Pune, India
August 2013 - May 2015
CGPA: 9.13/10

Bachelor of Technology, Electronics and Communication
Ramdeobaba College of Engineering and Management, Nagpur, India
May 2009 - July 2013
CGPA: 73.02%

WORK EXPERIENCE

Research Intern *(Incoming)*   22 May - 12 Aug 2023
Image and Video Processing Group, **Dolby Laboratories**

PPO Hardware Intern   2 May - 28 Aug 2022
Display Exploration Team, **Apple**
Modified components in the rendering pipeline to enable simulation and exploration of volumetric effects for prototype displays.
- Evaluated the requirements and limitations and developed an application to demonstrate the volumetric effects within the framework.
- Conducted psychophysical experiments to evaluate the effects of the algorithm.
- Generated ground truth data generation for deep learning based model of the algorithm.
- Contributed in optimization of the algorithm.

Research Intern   17 May - 3 Sept 2021
AR Display Engineering Team, **Facebook Reality Labs**
Developed AR Simulator to determine product specifications and inform engineering requirements.
- Evaluated the display pipeline feasibility of a Unity simulation.
- Simulated key components usable for Oculus link and standalone HMD device.
- Augmented existing simuations to the AR display pipeline components for a more realistic experience of the product.

Graduate Research Assistant   Fall 2019 - Present
Visual Imaging and Technology Lab, **Rochester Institute of Technology**
Develop an end-to-end solution for creating realistic experiences of the near planar cultural heritage objects.
- **Capturing and Modeling** : Develop a lightweight appearance capture system for near planar objects.

- **Visualization** : Develop a web-based tool for visualization of the captured digital models.
- **Interaction** : Develop techniques to render the digital models using the users real time environment.
- **Perception** : Create tools to help us understand material perception using the tangible display system.

Graduate Teaching Assistant Imaging Science, **Rochester Institute of Technology**

- Computer Resource Pool   Spring 2019
  Responsible for solving programming queries in the department.
- Imaging Science Fundamentals   Fall 2018
  Responsible for conducting and grading labs.

System Engineer   June 2015 - July 2018
Engineering and Industrial Services unit, **Tata Consultancy Services**, Pune, India

- Led Scripting functionality of Monitoring and Control (M&C) System for Giant Metrewave Radio Telescope (GMRT), a precursor for Square Kilometer Array (SKA).

COURSES COMPLETED

Image Processing and Computer Vision, Radiometry, The Human Visual System, Optics for Imaging, Foundation of Computer Graphics, Global Illumination

SKILLS

Working Knowledge: Python, Unity, GLSL/HLSL, Three.js, MATLAB, JavaScript, HTML
Basic Knowledge: C/C++, PyTorch, TensorFlow, Java, C#

PUBLICATIONS

- Padhye, S., Messinger, D., Ferwerda, J., 'SVBRDF estimation using a normal sorting technique', **SIGGRAPH** Poster Session (2022). Also shortlisted and featured in the technical paper session.
- Padhye, S., Messinger, D., Ferwerda, J., 'SVBRDF estimation using a normal sorting technique', **Journal of Imaging Science and Technology (JIST)** (2022).
- Padhye, S., Ferwerda, J., 'Real-time illumination capture and realistic rendering on mobile devices', **Frameless** Journal (2021).
- Padhye, S. et al.,'Visual perception of surface properties through direct manipulation', **VSS** (2021). Recipient of **Elsevier Vision Research Virtual Travel Award**.
- Ferwerda, J. and Padhye, S., 'Visual Perception of Surface Properties Through Manipulation', **Color and Imaging Conference(CIC)** (2021).
- Padhye, S., Messinger, D., Ferwerda, J., 'A Practitioner's guide to Fringe Projection Profilometry', **Archiving** (2021).
- Padhye, S., Messinger, D., Ferwerda, J., 'A Web-based Visualization Tool for Multispectral Images', **Electronic Imaging (EI)** (2021).
- Padhye, S., Messinger, D., Ferwerda, J., 'A simple web-based tool for multispectral and topographical visualization', **SPIE Defence + Commercial Sensing** (2021).

- Padhye, S., Messinger, D., Ferwerda, J., 'Digital Modeling Of Cultural Heritage Objects', **Frameless** Journal (2019).

ACADEMIC CONTRIBUTIONS

- Course titled ' Measuring, modeling and rendering surface appearance' offered in **Archiving-21**, **CIC-21**, **CIC-22** with Dr. James Ferwerda.
- Served as **reviewer** for Archiving-22.
- Presented 'Measuring, Modeling, and Visualizing Surface Appearance' with Dr. James Ferwerda in Color & Imaging **Webinar** - 2020.

PROJECTS

Realistic Digital Modeling & Visualization of cultural heritage objects   Python, MATLAB, C#
Working on developing a system capable of capturing surface topography along with the material properties to construct a realistic digital model of planar cultural heritage objects such as paintings and manuscripts.

- Diffuse, specular, roughness capture using Linear Light Reflectometry.
- Height/Normal estimation using stereo imaging.
- Height/Normal estimation using structured light imaging (Gray code and fringe projection profilometry).
- Normal and roughness estimation using LCD screen as light source.
- Web-based normal and roughness estimation using ipad LCD screen as light source.
- Projector-camera (Pro-Cam) setup to capture height/normal, diffuse, specular and roughness of a material.
- Calibration of Pro-Cam system through simulation.

Tools for Multispectral Visualization   Three.js, Python
Working on developing Web-based tools for simultaneous visualization and analysis of mutispectral and multimodal data.

Visual perception of surface properties through direct manipulation   Three.js, HTML, Python
Developing a series of psychophysical experiments to understand how the dynamic visual patterns are coded to provide information to perceive changes in shape or material of the object.

Lightweight & real time capturing & rendering scene illumination   JavaScript, HTML, Python
Developed an application to capture user's real time illumination environment and use it to render an object in the virtual scene on mobile devices. The effect of change in illumination in user's environment is reflected in the virtual scene.

OCR on curved surfaces   Python, Tensorflow
Worked on applying deep learning to recognize text from randomly curved surfaces. The motivation is to use it as an application to aid shoppers in automatic nutrition and price comparison of products.