

Aakash KT

Ph.D Candidate, CVIT, IIIT Hyderabad

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Introduction

I am a third year Ph.D student at CVIT, IIIT Hyderabad, supervised by Dr. P. J. Narayanan. I work on photorealistic real-time rendering with path-tracing. I am also mentoring two graduate students on two different projects: Neural Rendering and Precomputed Radiance Transfer with Spherical Harmonics.

Education

2020 - **Ph.D in Computer Science, IIIT Hyderabad.**

current **Advisor:** Prof. Dr. P. J. Narayanan, **CGPA:** 8.0/10.0

Working on advancing the areas of real-time photorealistic rendering, precomputation based rendering and neural rendering.

2015 - 2020 **BTech and MS by Research in Computer Science, IIIT Hyderabad.**

CGPA: 7.21/10.0

Relevant courses: Computer Graphics, Computer Vision, Digital Image Processing, Artificial Intelligence, Statistical Methods in AI, Optimization Methods, Advanced Computer Networks, Operating Systems, Software Engineering.

Experience

Aug 2022 - **Research Scientist Intern, Meta Reality Labs, Pittsburgh.**

Jan 2023 **Manager:** Dr. Giljoo Nam

Working on real-time photorealistic rendering of hair with multiple scattering. The challenge is to accurately approximate multiple scattering for large number of bounces, with only a few rays per pixel while achieving real-time framerates.

Other team members: Matt Jen-Yuan Chiang, Olivier Maury, Christoph Hery, Carlos Aliaga & Adrian Jarabo

2017 - 2020 **Research Assistant, CVIT, IIIT Hyderabad.**

Advisor: Dr. P. J. Narayanan

Worked on Neural Rendering for specific usecases and appearance editing from captured photographs. I also worked on depth estimation from focus images and explored deep generative models for domain adaptation.

2017 summer **SDE intern, Linux Foundation.**

I worked on the JOID installer for deploying SDN (Software-defined networks) solutions. Specifically, my work helped automate the deployment of Kubernetes with OVN as the SDN. I also worked on automating the deployment of Clearwater vIMS on Kubernetes. I was invited to present my work at the OPNFV Plugfest at **Intel, Portland, USA.**

Publications

- I3D 2022 **Bringing Linearly Transformed Cosines to Anisotropic GGX**, *Best Paper Award*.
Aakash KT, Eric Heitz, Jonathan Dupuy, P. J. Narayanan
We present robust solutions to fit LTCs for anisotropic BRDFs, in the context of real-time area light shading. This work is expected to be integrated into the Unity game engine. [PAPER LINK](#)
- EG 2022 **Precomputed Radiance Transfer Using Transfer Textures**, *Poster*.
Dhawal Sirikonda, **Aakash KT**, P. J. Narayanan
We analyze and extend PRT to use textures for storing transfer, instead of storing it at vertices of a mesh. [POSTER LINK](#)
- EGSR 2021 **Fast Analytic Soft Shadows from Area Lights**, *Full Paper*.
Aakash KT, Parikshit Sakurikar, P. J. Narayanan
We present a solution which uses LTCs for analytically computing shading and soft shadows from area lights, which naturally produces noise-free renderings as compared to equivalent stochastic methods. Ours is a structured approach to analytically compute soft shadows from spherical projections of lights and occluders with any 3D shape and efficiently for convex 3D shapes. [PAPER LINK](#)
- ICVGIP 2021 **Neural View Synthesis with Appearance Editing from Unstructured Images**, *Full Paper*.
Pulkit Gera, **Aakash KT**, Dhawal Sirikonda, Parikshit Sakurikar, P. J. Narayanan
We present a neural rendering framework for simultaneous view synthesis and appearance editing of a scene with known environmental illumination captured using a mobile camera. Our approach explicitly disentangles the appearance and learns a lighting representation that is independent of it. We show results of editing the appearance of real scenes in interesting and non-trivial ways. [PAPER LINK](#)
- SIGGRAPH Asia 2019 **A Flexible Neural Renderer for Material Visualization**, *Technical Brief*.
Aakash KT, Parikshit Sakurikar, Saurabh Saini, P. J. Narayanan
Our work proposed a neural rendering solution for visualizing physically accurate (PBR) materials. We designed our neural network to provide control over the environment lighting for better and faster visualization of materials. This optimizes the work flow of artists by removing the bottleneck of slow, path-traced visualizations. [PAPER LINK](#)

Achievements & Activities

- 2022 **Best Paper Award**, *I3D 2022*.
Received NVIDIA RTX 3090 as the prize.
- 2022 **Tertiary Reviewer**, *ICVGIP 2022*.
- 2021 **Tertiary Reviewer**, *Pacific Graphics 2021*.
- 2020 **KCIS Ph.D fellowship**.
Received the prestigious KCIS Ph.D fellowship for my research.
- 2019 **Microsoft Research Travel Grant**.
Received a travel grant from Microsoft to present my work at **SIGGRAPH Asia 2019** in Brisbane, Australia.
- 2019-2020 **Web Chair**, *CODS-COMAD 2020*.

2018 **CANSAT competition, NASA, Texas, USA.**

Participated in the CANSAT competition in which teams build a payload that is released from a height of thousand meters. The task is to perform various maneuvers and get back to land, all without damaging an egg kept inside the payload. **Secured a world rank of 24 as co-team leader.**

Selected Projects

2019-2020 **Single Image SLAM with geometry priors, Prof. Madhava Krishna.**

Assisted work to improve Single Image SLAM with geometry information, using neural rendering and inverse rendering. This work was later published at a **CVPR 2020** workshop.

2017 **Denoising Using Recurrent Autoencoder, Prof. P.J.N.**

Implemented a **SIGGRAPH 2017** paper, as part of a research project. Used **PyTorch** framework to implement the Recurrent Neural Network. Code available on [Github](#).

2017 **MagicBrix: 3D game in OpenGL, Prof. Avinash Sharma.**

Replica of the popular game Bloxors, with full 3D textures and lighting. Developed using **C++, OpenGL**

Softwares & Programming Languages

Softwares **OptiX, OpenGL, Mitsuba 2, PBRT, Blender 3D, Substance Painter, Unity 3D.**
Languages **C++, C, Python.**