SAEED HADADAN

PhD Candidate, Email: saeedhd@umd.edu Homepage & Google Scholar & Github

EDUCATION

University of Maryland, College Park, MD, USSeptember 2019 - PresentPhD Candidate, Computer ScienceAdvisor: Prof. Matthias ZwickerAdvisor: Prof. Matthias ZwickerThesis title: "Towards inverse rendering while accounting for global illumination"University of Maryland, College Park, MD, USSeptember 2019 - May 2022MSc, Computer ScienceSeptember 2019 - May 2022Sharif University of Techology, Tehran, IranSeptember 2014 - July 2019Bachelors of Science, Computer Engineering-SoftwareThesis Advisor: Dr. Mahdi Jafari Siavoshani

RESEARCH INTERESTS

• Computer Graphics and Vision, Computational Photography, and Generative AI:

Differentiable Physically-based Rendering, Novel View Synthesis, Neural Path Guiding, Neural Importance Sampling, 3D Diffusion Models

Summary of research statement: My PhD research focus has been on rendering/inverse rendering and 3D reconstruction by exploiting the capabilities of deep learning-based AI techniques, as well as generative AI. My research has application in virtual reality, digital entertainment and multimedia.

In particular, I proposed a novel method of solving the rendering equation using a single neural network in a paper called 'Neural Radiosity'. My follow-up papers extended the idea of Neural Radiosity to 3D reconstruction, to account for global illumination in inverse rendering in primal and differential space. By accounting for global illumination, my research enabled 3D reconstructions of the real world, in the wild, presented in the paper 'GANI'. These projects were in line with my thesis title 'Towards inverse rendering with global illumination.' On a different topic, I proposed a method on importance sampling of neural incident radiance fields to accelerate rendering using path guiding. The resulting method is a US patent and is used in production in Disney company.

Another focus of my research has been on utilizing generative AI in reconstruction tasks. In particular, I have upcoming papers on generative material detail enhancement using diffusion models, in which I made innovations on training-free and multi-view consistent image generation. Some in progress projects involve augmenting NeRF-like training data using diffusion models as well as relighting textures.

ONGOING PROJECTS

• 3D reconstruction data augmentation using diffusion models

PUBLICATIONS

• Generative Detail Enhancement for Physically Based Materials Saeed Hadadan, Benedikt Bitterli, Tizian Zeltner, Jan Novák, Fabrice Rousselle, Jacob Munkberg, Jon Hasselgren, Bartlomiej Wronski, Matthias Zwicker 2025, arXiv (soon) • Neural Path Guiding

US Patent filed, collaboration with Disney Research 2024, Soon to be published

- GaNI: Global and Near Field Illumination Aware Neural Inverse Rendering Jiaye Wu, Saeed Hadadan, Geng Lin, Matthias Zwicker, David Jacobs, Roni Sengupta 2024, arXiv
- Neural Differential Radiance Field: Learning the Differential Space Using a Neural Network

Saeed Hadadan, Matthias Zwicker Computer Graphics International 2023, Shanghai, Published in book: Advances in Computer Graphics by Springer. Page

- Inverse Global Illumination using a Radiometric Prior Saeed Hadadan, Geng Lin, Jan Novák, Fabrice Rousselle, Matthias Zwicker ACM SIGGRAPH Conference Proceedings 2023, Los Angeles, project page
- Neural Radiosity Saeed Hadadan, Shuhong Chen, Matthias Zwicker ACM Transactions on Graphics (SIGGRAPH Asia) 2021, Tokyo, project page, publicity
- A Novel Communication Cost Aware Load Balancing in Content Delivery Networks using Honeybee Algorithm, Hamid Ghasemi, Mahdi Jafari Siavoshani, Saeed Hadadan 2019, arXiv

PEER-REVIEW

- Reviewer at SIGGRAPH 2025, SIGGRAPH 2024, Eurographics 2024, SIGGRAPH Asia 2023.
- Editorial manager at Computer and Graphics, Elsevier.

WORK EXPERIENCE

NVIDIA	

Research Intern

Worked on 3D diffusion models that led to a submission.

Disney Research

Research Intern

· Worked on a neural path guiding project that resulted in a US patent.

NVIDIA

Research Intern

· Worked on an inverse rendering project. The resulting paper was accepted at SIGGRAPH 2023.

University of Maryland Research Assistant

Working with Prof. Matthias Zwicker.

SKILLS

July 2023 - October 2023

September 2022 - December 2022

Summer 2020 - Present

June 2024 - present

Programming	Python, C++, JavaScript, Java, MATLAB, Git
Graphics	Mitsuba, Blender, WebGL, JOGL, Open3d
Machine Learning	PyTorch, NumPy
Data Science	Pandas, SQL, d3

TEACHING EXPERIENCE

University of Maryland Teaching Assistant	2019 - Present
 CMSC740: Advanced Computer Graphics - 2021, 22, 23, 24 CMSC427: Computer Graphics - Fall 2020 CMSC417: Computer Networks - Spring 2020 CMSC320: Intro to Data Science - Fall 2019 	
Sharif University of Technology Research Assistant	2018 - 2019
\cdot Worked on a novel method for load balancing in CDNs resulting in a paper.	
Sharif University of Technology Teaching Assistant	2017 - 2018
 Data Structures & Algorithm - Spring 2018 Probability & Statistics of Computer Engineering - Fall 2017 General English, Lingusitics and Language Department - Fall 2017 	
National Organization for Development of Exceptional Talents Advanced Chemistry Teacher	2013-2018
\cdot Analytical Chemistry, Organic Chemistry, Physical Chemistry, Olympiads preparation	1
HONORS AND AWARDS	
• Recipient of Dean's Fellowship, UMD, 2019, 2020.	
• Recipient of study grant from National Elites Foundation, Iran, 2013-2018.	
• Awarded a silver medal in National Chemistry Olympiads, Iran, 2013.	

RELEVANT COURSES

- Differentiable Programming (UMD grad course)
- Advanced Foundations of Deep Learning (UMD grad course)
- Advanced Computer Graphics (UMD grad & Sharif undergrad course)
- Advanced Computer Networks (UMD grad & Sharif undergrad course)

EXTRA CURRICULAR

- Elected member of Graduate Student Government CMSC representative, UMD 2021
- Member of International Student Advisory Board (ISAB), UMD 2021
- International Student Orientation Leader (IOL), UMD 2020