

PETER KOCSIS

peter.kocsis@tum.de ◇ peter-kocsis.github.io

Deep Learning researcher with 8+ years of experience in Computer Vision & Graphics, focusing on 2D/3D material and lighting estimation for relightable reconstruction and generation. Experienced in training GenAI models for intrinsic image decomposition and lifting image understanding to 3D. Started as a mechatronics engineer giving strong physical understanding, did research in monocular localization, neural control, reinforcement learning for motion planning, and active learning for low-data generalization. Finishing now my Ph.D. at TUM (Prof. Matthias Nießner), with 4 first-author papers and one pending submission at top-tier conferences.

Looking for Research Scientist & Engineer opportunities in 2D/3D/4D GenAI and inverse rendering.

Current location: Munich, Germany.

PUBLICATIONS & PREPRINTS

Intrinsic Image Fusion for Multi-View 3D Material Reconstruction 2025

Kocsis P., Höllein L., Nießner M.

under review

We proposed a method to reconstruct fully relightable of room-scale scenes (PBR textures) by consistently aggregating single-view generative material estimations and utilizing them in inverse path tracing

IntrinsiX: High-Quality PBR Generation using Image Priors 2025

Kocsis P., Höllein L., Nießner M.

NeurIPS

We develop a text-to-PBR diffusion model, which enables editable image generation, as well as room-scale scene texturing using SDS

Intrinsic Image Diffusion for Indoor Single-view Material Estimation 2024

Kocsis P., Sitzmann V., Nießner M.

CVPR

We utilize diffusion models for the inherently ambiguous appearance decomposition task and transfer the strong prior of pre-trained models for material estimation

LightIt: Illumination Modeling and Control for Diffusion Models 2024

Kocsis P., Philip J., Sunkavalli K., Nießner M., Hold-Geoffroy Y.

CVPR

We introduce explicit control over the lighting for diffusion models using shading-map conditioning

The Unreasonable Effectiveness of Fully-Connected Layers for Low-Data Regimes 2022

Kocsis P., Súdek P., Brasó G., Nießner M., Leal-Taixé L., Elezi I.

NeurIPS

We show that using final fully connected layers improve the generalization from low amount of data in image classification

EDUCATION

Technical University of Munich

Munich, Germany

Ph.D. in Deep Learning

11/2021 - Present

Topic: *Intrinsic Image Understanding and Generation using Image Priors*, Prof. Matthias Nießner

Technical University of Munich

Munich, Germany

M.Sc. in Robotics, Cognition, Intelligence

10/2019 - 09/2021

Thesis: *Active Learning with Graph Neural Networks*, Prof. Laura Leal-Taixé

Final Grade: 1.2 (Excellent, best 1.0)

DAAD Scholarship

Budapest University of Technology and Economics

Budapest, Hungary

B.Sc. in Mechatronics

2015 - 2019

Thesis: *Reinforcement Learning for Balancing Control*, Dr. Petra Aradi

Final Grade: 5.0 (Excellent, best 5.0)

PROFESSIONAL EXPERIENCE

Technical University of Munich - Prof. Matthias Nießner

Munich, Germany

Research Scientist, Ph.D. student

11/2021 - Present

Single and multi-view material and lighting estimation and generation for relightable assets

Published 3 first-author works, fourth paper is under review (CVPR).

Supervised 4 Master's students; tutor at masters-level 3D Scanning and Spatial Learning practical; 3D Vision seminar

Adobe

San Jose CA, USA

Research Scientist Intern - Yannick Hold-Geoffroy, Julien Philip, Kalyan Sunkavalli

05/2023 - 09/2023

Research in lighting representation and control for diffusion models

Project published at CVPR (LightIt) and patent submitted

CommonRoad

Munich, Germany

Student Researcher - Chair of Robotics, Artificial Intelligence and Real-Time Systems

03/2020 - 11/2020

Research in Reinforcement Learning for motion planning of autonomous vehicles

Developing interactive simulations

Evosoft Ltd.

Budapest, Hungary

Software Engineer

07/2018 - 08/2019

Software development and architecture planning in C++ and C#

Machine Perception Research Laboratory

Budapest, Hungary

Student Researcher

06/2017 - 09/2017

Research in monocular visual localization

C++ and CUDA programming

TALKS

Virtual Staging AI (acq. by Zillow) [04/2024] ◇ TUMVision [10/2024] ◇ Apple Munich [10/2025] ◇ TUMVision [11/2025]

STUDENT SUPERVISION

Bendeguz Timar, M.Sc.

Technical University of Munich

Intrinsic Image Distillation for Room-Scale Material Reconstruction

Youssef Hafez, M.Sc.

Technical University of Munich

Variance Reduction Techniques for Inverse Path Tracing

Mohamed Ebbed, M.Sc.

Technical University of Munich

ShadedSDF: Volumetric Surface Reconstruction with Appearance Decomposition Constraints

Yue Chen, M.Sc.

Technical University of Munich

Multi-Bounce Appearance Decomposition

ACHIEVEMENTS

Best In TUM Membership (Top 2%) ◇ CommonRoad Motion Planning AI Challenge 1. Price ◇ World Robot Olympics ◇ Unilever Engineering Challenge 1. Price ◇ BME Mathematics Competition 2. Price ◇ Various Programming and Maths Challenges

SKILLS

2D/3D Computer Vision ◇ (Inverse) Graphics ◇ Material Estimation (BRDFs) ◇ Lighting Estimation ◇ Relighting ◇ Diffusion Model training and fine-tuning ◇ 3D Modeling and Reconstruction ◇ SLURM ◇ Python ◇ PyTorch ◇ Blender ◇ Mitsuba ◇ Hydra ◇ W&B ◇ C/C++ ◇ C#/.Net ◇ CAD (Solidworks) ◇ German ◇ English ◇ SCRUM Master Certificate ◇