



# Zhenyuan (Desmond) Liu


PhD Student, ETH Zurich, Switzerland


Advisor: Prof. Bernd Bickel; Expected Graduation Date: 02/2028

Research Interests: inverse rendering, thermal simulation, and digital fabrication

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## Publications

**Liu Zhenyuan**, Bharath Seshadri, George Kopanas, Bernd Bickel: “Inverse Radiative Transport for Infrared Scenes with Gaussian Primitives”, *SIGGRAPH Asia 2025 Conference Papers*. doi: 10.1145/3757377.3763938

**Liu Zhenyuan**, Yu Guo, Xinyuan Li, Bernd Bickel, Ran Zhang: “BiGS: Bidirectional Gaussian Primitives for Relightable 3D Gaussian Splatting”, *3D Vision 2025*. doi: 10.1109/3dv66043.2025.00099

**Liu Zhenyuan**, Michal Piovarči, Christian Hafner, Raphaël Charrondière, Bernd Bickel: “Directionality-Aware Design of Embroidery Patterns”, *Computer Graphics Forum (Eurographics 2023)*. doi: 10.1111/cgf.14770

**Zhenyuan Liu**, Jingyu Hu, Hao Xu, Peng Song, Ran Zhang, Bernd Bickel, Chi-Wing Fu: “Worst-Case Rigidity Analysis and Optimization for Assemblies with Mechanical Joints”, *Computer Graphics Forum (Eurographics 2022)*. doi: 10.1111/cgf.14490

## Education

### ETH Zurich, Switzerland

PhD Student; Supervisor: Prof. Bernd Bickel.

2024.02 – Present

### EPFL, Switzerland

PhD Student in Computer and Communication Sciences

2022.09 – 2023.09

### The Chinese University of Hong Kong (CUHK)

BSc. in Computer Science; First Class Honors; Major GPA: 3.95/4.00

Exchange Program at *University of Toronto* (2020.01 – 2020.04)

2017.09 – 2021.07

## Research Experience

### Research Intern: Relightable 3D Gaussian Splatting

2023.09 – 2024.02

- Advisor: Ran Zhang, Tencent North America
- Developed a novel 3D representation for relightable rendering with Gaussian splatting
- Participated in internal projects on video generation using diffusion models
- Presented the results as a paper at **3D Vision 2025**, Singapore

### Research Intern: Computational Embroidery

2021.09 – 2022.08

- Advisor: Prof. Bernd Bickel, Institute of Science and Technology Austria (ISTA)
- Recreated a chromatic image in the real world using a programmable sewing machine
- Presented the results as a technical paper at **Eurographics 2023**, Saarbrücken, Germany

### Software Engineer Intern, Tencent, China

2021.01 – 2021.06

- Maintained the backend billing platform that processes millions of API invocations for the cloud services
- Developed using Golang the backend of an internal data platform service

## Awards and Honors

EPFL EDIC PhD Student Fellowship

2022

Arthur and Louise May Memorial Scholarship

2020

Professor Charles K. Kao Research Exchange Scholarship

2020

## Miscellaneous

- Served as Teaching Assistant and prepared materials for *Introduction to Computer Graphics Spring 2023* at EPFL; *Materials for Architectural Rendering Autumn 2024* and *Computational Design III* at ETH Zurich
- Served as Reviewer for *ACM SIGGRAPH North America*, *ACM SIGGRAPH Asia*, *ACM Symposium on Computational Fabrication*
- Coding skills: Python (PyTorch, NumPy), C++ (Eigen)