# Haato Watanabe

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## Summary

PhD student at The University of Tokyo (advised by Prof. Nobuyuki Umetani) working on differentiable 3D representations and Gaussian Splatting.
First-author CVPR 2026 paper on high-frequency surface reconstruction.
Experienced in designing and implementing high-performance research systems, including CUDA-based differentiable rendering pipelines, neural field models, and real-time visualization frameworks.
Seeking research internship opportunities in Computer Graphics, Vision, and Generative AI.
Research Interests: Differentiable rendering, neural 3D representations, Gaussian Splatting, real-time graphics

## Education

**The University of Tokyo** *April 2026 -*

*PhD in Graduate School of Information Science and Technology*

- Research on editable and differentiable 3D scene representations

**The University of Tokyo** *April 2024 – Mar 2026*

*M.S in Graduate School of Information Science and Technology*

- Research on high-frequency neural rendering and Gaussian Splatting

**Tokyo University of Science** *April 2019 – Mar 2024*

*B.S in Industrial and Systems Engineering*

- Primarily studied statistics and fundamental computer science.

## Work Experience

**Huawei (Tokyo Research Center) — Research Intern** *November 2025 –*

- Conducting research on computer graphics and differentiable rendering within the CG research team.
- Working on efficient representations and optimization techniques for dynamic 3D scene representations.
- Collaborating with researchers in an international research environment.

**Preferred Networks (PFN) — Intern: R&D Software Engineer** *August 2024 – December 2024*

- Built a real-time web viewer for 4D Gaussian Splatting with continuous-time queries
- Enabled interactive rendering of dynamic scenes in browser (WebGL-based pipeline)
- Achieved real-time browser-based rendering for 200,000 dynamic Gaussian primitives
- The project was featured on the PFN Tech Blog: tech.preferred.jp/ja/blog/4d-gaussian-splatting-web-viewer/

**Matsuo Institute Inc. — Software Developer Intern** *Feb 2024 – July 2024*

- Developed LLM-based applications using OpenAI APIs for internal use

**Plaid Inc. — Software Engineer Intern** *Mar 2022 – Jan 2023*

- Contributed to production web services (frontend/backend, testing pipelines)

## First-author Publications

**Neural Gabor Splatting: Enhanced Gaussian Splatting with Neural Gabor for High-frequency Surface Reconstruction**

- **Haato Watanabe**, Nobuyuki Umetani
- CVPR 2026
- Project Page: haatowatanabe.com/projects/neural-gabor-splatting
- arXiv: arxiv.org/abs/2604.15941
- Code: github.com/haato-w/neural-gabor-splatting

**SketchRodGS: Sketch-based Extraction of Slender Geometries for Animating Gaussian Splatting Scenes**

- **Haato Watanabe**, Nobuyuki Umetani
- ACM, SIGGRAPH Asia 2025 Technical Communications (SA Technical Communications '25)
- Project Page: haatowatanabe.com/projects/sketchrodgs/
- arXiv: arxiv.org/abs/2601.02072
- Code: github.com/haato-w/sketch-rod-gs

**3D Gabor Splatting: Reconstruction of High-frequency Surface Texture using Gabor Noise**

- **Haato Watanabe**, Kenji Tojo and Nobuyuki Umetani
- Proceedings of the Eurographics 2025 Short Papers, 2025, Eurographics Association
- Selected for Oral Presentation at MIRU 2025
- Project Page: haato-w.github.io/3d-gabor-splatting-project-page/
- arXiv: arxiv.org/abs/2504.11003
- Code: github.com/haato-w/3d-gabor-splatting

## Awards & Fellowships

- SPRING GX Fellowship, The University of Tokyo, 2026– : Competitive fellowship awarded to selected graduate students for research excellence
- **Dean's Award, The University of Tokyo**
- **Master's Representative**, The University of Tokyo Graduation Ceremony, 2026
- **Best Communications Award**, SIGGRAPH Asia 2025 Technical Communications: Top award in the Technical Communications track
- **Excellent Paper Award**, MIRU 2025
- **Audience Award**, MIRU 2025

## Others

- Reviewer (by invitation), Pacific Graphics 2025. Reviewed a full paper on 3D reconstruction using differentiable representations.

## Technical Skills

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|---|---|
| **CUDA** | custom kernel implementation, MLP forward/backward, differentiable rendering |
| **PyTorch** | extension development, training pipelines for neural rendering |
| **WebGL / OpenGL** | real-time rendering, interactive visualization systems |