Haato Watanabe

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Summary

Graduate researcher specializing in computer graphics and computer vision, with a strong focus on differentiable 3D representations and Gaussian Splatting. Experienced in designing end-to-end research systems that span algorithm design, CUDA/PyTorch implementation, and interactive visualization. Author of peer-reviewed papers at top international venues, with hands-on experience in building real-time demos and large-scale experimental pipelines. Seeking research or applied research roles where deep technical implementation and novel ideas are equally valued.

Education

The University of Tokyo *April 2024 –*

M.S in Graduate School of Information Science and Technology

- Research on differentiable 3D representations, Gaussian Splatting, and interactive editing systems

Tokyo University of Science *April 2019 – Mar 2024*

B.S in Industrial and Systems Engineering

- Primarily studied statistics and fundamental computer science.
- Relevant Coursework: Algorithms, Machine Learning, Operating System, Theory of Computing

Work Experience

Preferred Networks Inc. (Otemachi, Tokyo) *August 2024 – December 2024*

Intern: R&D Software Engineer

- Developed a web-based interactive viewer for 4D Gaussian Splatting (4DGS), enabling visualization of dynamic 3D scenes over continuous time.
- Designed the system to support arbitrary time queries, allowing smooth temporal navigation beyond discrete frame playback.
- To the best of our knowledge at the time, this was the first web viewer capable of handling continuous-time 4DGS scenes.
- Implemented the viewer with a focus on real-time interaction and usability in a browser environment.
- The project was featured on the PFN Tech Blog: https://tech.preferred.jp/ja/blog/4d-gaussian-splatting-web-viewer/
- Key Technologies : TypeScript | WebGL | React | Svelte

Matsuo Institute Inc. (Hongo, Tokyo) *Feb 2024 – July 2024*

Intern: software developer

- Developed and deployed LLM-based applications using OpenAI APIs for internal strategic use.
- Key Technologies : Autogen | self prompt improvement

Plaid Inc. (Ginza, Tokyo) *Mar 2022 – Jan 2023*

Intern: software developer

- Worked as an engineer in a production web service development team for nearly one year.
- Contributed to both frontend and backend development, including API implementation, UI updates, and system maintenance.
- Built and maintained automated end-to-end testing pipelines for web services.
- Key Technologies: TypeScript, Vue, Node.js, MongoDB, CI/CD

Alice Inc. (Toranomon, Tokyo) *Jul 2021 – Jan 2022*

Intern: Machine Learning application developer

- Developed a license plate recognition system that operates on Jetson.
- Achieved recognition accuracy equivalent to existing products at the time in case of ideal environmental brightness and angles.
- Created character detection process using OpenCV, and trained character recognition Deep Learning model with the ETL character database.
- Quantized the Deep Learning model for deployment on Jetson's memory, accelerated inference speed using TensorRT.
- Key Technologies : Jetson | OpenCV | Pandas | Scikit-learn | Tensorflow | TensorRT

Publication

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)

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

Exploring User's Line of Sight And Word Gesture Text Entry Techniques in Virtual Reality

- Haato Watanabe, Ryo Hatano, Hiroyuki Nishiyama
- Proceedings of the International Symposium on Artificial Life and Robotics (AROB 2024)

Selected Projects

SketchRodGS (Research Prototype)

- Official implementation of "SketchRodGS: Sketch-based Extraction of Slender Geometries for Animating Gaussian Splatting Scenes" (SIGGRAPH Asia 2025).
- Built an interactive system for sketch-based extraction, elastic rod simulation, and animation of Gaussian Splatting scenes.
- Implemented custom viewers and simulation pipelines for live demos.
- GitHub: https://github.com/haato-w/sketch-rod-gs

Gabor Splatting (Research Code)

- Official implementation of "3D Gabor Splatting: Reconstruction of High-Frequency Surface Texture using Gabor Noise" (Eurographics 2025).
- Implemented a differentiable Gabor-based Gaussian representation with custom CUDA/PyTorch kernels.
- Designed frequency-aware optimization and evaluation pipelines for high-frequency surface reconstruction.
- GitHub: https://github.com/haato-w/3d-gabor-splatting

Award

- Best Communication Award, SIGGRAPH Asia 2025 Technical Communications
- Excellent Paper Award & Audience Award, MIRU 2025

Others

- Reviewer (by invitation), Pacific Graphics 2025. Reviewed a full paper on 3D reconstruction using differentiable representations.
- Led a team to victory at DeNA's Autumn Hackathon as a leader, developing an information-sharing app for cyclists using React, Django, and SQLite deployed on the cloud.
- Led a team in an university hackathon, developing an application using OpenPose for posture estimation to manage user posture during desk work.

Other Skills

Programming Languages	***Experienced:*** Python | TypeScript | C | C++ | CUDA ***Familiar:*** Bash | Java | C#
Frameworks & Libraries	Linux | Docker | REST API | PyTorch | Numpy | Django | OpenGL | WebGL | Unity
Languages	Japanese (Native) English (Professional working proficiency)