Haotian Liu

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EDUCATION

Worcester Polytechnic Institute **Worcester, MA/U.S**
Undergraduate Student in Robotics Engineering Expected May 2025

PUBLICATIONS (* co-first author)

[1] **Haotian Liu***, Fangzhou Lin*, Songlin Hou, Haoying Zhou, Kazunori Yamada, Gregory S. Fischer, Yanhua Li, Ziming Zhang **Loss Distillation via Gradient Matching for Point Cloud Completion with Weighted Chamfer Distance** *Under Review*

[2] Yijia Wu*, Zilin Dai*, **Haotian Liu**, Lehong Wang, Markus P. Nemitz **Vision-based FDM Printing for Fabricating Airtight Soft Actuators** *IEEE RoboSoft 2024* Pre-print

[3] Lehong Wang, Savita V. Kendre, **Haotian Liu**, Markus P. Nemitz **STREAM: Software Tool for Routing Efficiently Advanced Macrofluidics** *Under Review* Pre-print

[4] **Haotian Liu**, Haohao Yi, Lehong Wang, Meng Wang, Wirt Jones, Yujie Guo, Yifu Yuan **Toward Wearable Multimodal Neuroimaging** *Digital WPI* Pdf

[5] **Haotian Liu**, Lin Xi, Ying Zhao, Zhixiang Li **Using deep learning and machine learning to detect epileptic seizure with electroencephalography (EEG) data** *arXiv* Pre-print

RESEARCH EXPERIENCE

Loss Optimization for Point Cloud Completion (*Publication index* [1]) **Worcester, MA**
Supervisor: Prof. Ziming Zhang May. 2023 – November. 2023
Description:
- Proposed a family of weighted Chamfer Distance via Loss Distillation.
- Proposed a novel bilevel optimization formula to train the backbone network based on the weighted CD loss.
- Conducted comprehensive experiments with novel networks in benchmarks to examine the findings.

Vision-based Close-loop 3D Printing for Airtight Structures (*Publication index* [2]) **Worcester, MA**
Supervisor: Prof. Markus P. Nemitz August. 2023 – November. 2023
Description:
- Proposed a low-cost, vision-based, and close-loop approach to improving the FDM printing quality.
- Achieved airtightness of printed soft pneumatic actuators without fine-tuning printing parameters.
- Validated the approach through extensive underwater testing and numerical analysis.

A Blender Add-on for Efficient Fluid Circuit Generation (*Publication index* [3]) **Worcester, MA**
Supervisor: Prof. Markus P. Nemitz February. 2023 – September. 2023
Description:
- Introduced a software-based workflow that generates printable fluidic networks automatically.
- Proposed a three-dimensional A* algorithm for pathfinding.
- Introduced the concepts of surface-mount technology from PCB design into Macrofludic circuits.

WPI IQP-Toward Wearable Multimodal Neuroimaging (*Publication index* [4]) **Worcester, MA**
Supervisors: Prof. Ali Yousefi and Prof. Soroush Farzin May. 2022– September. 2022
Description:

- Constructed compact, user-friendly, and low-cost wearable EEG chip.
- Developed a Bluetooth low-energy communication system.

SKILLS & INTERESTS

Languages: Fluent in Chinese and English; Reading in Japanese
Programming: Python, C++, MATLAB.
Tools: SolidWorks, Prusa Slicer, Blender, Illustrator, Multisim, Altium Designer.
Robotics: ROS, UR5, TurtleBot, PyBullet, OMPL, PDDL
Selected Core Courses: RBE 501 Robot Dynamics; RBE 550 Motion Planning; ECE/CS 545 Digital Image Processing**;** CS4342 Machine Learning; ECE 2049 Embedded System Programming; ES 3011 Control Engineering.