Wei-Chen Li

wei-chen-li.github.io | Google Scholar | wli777@gatech.edu | +14046108335

Education

2025 - present PhD in Robotics at **Georgia Institute of Technology**

2022 - 2024 MS in Mechanical Engineering at **National Taiwan University**

2017 - 2021 BS in Mechanical Engineering at **National Taiwan University**

Publications

[1] W.-C. Li and G. Chou, "Certified gradient-based contact-rich manipulation via smoothing-error reachable tubes," Submitted to Robotics: Science and Systems. DOI: 10.48550/arXiv.2602.09368.

[2] W.-C. Li and G. Chou, "A convex formulation of compliant contact between filaments and rigid bodies," in *2026 IEEE International Conference on Robotics and Automation*, 2026. DOI: 10.48550/arXiv.2509.13434.

[3] W.-C. Li and C.-Y. Lin, "Eddy current defect tomography using a hybrid binary vector recovery algorithm," *IEEE/ASME Transactions on Mechatronics*, vol. 30, no. 4, pp. 3072–3080, 2025. DOI: 10.1109/TMECH.2025.3565800.

[4] W.-C. Li and C.-Y. Lin, "Sparse magnetic array for the imaging of defects in multilayer metals," *IEEE Sensors Journal*, vol. 24, no. 9, pp. 14 082–14 092, 2024. DOI: 10.1109/JSEN.2024.3381623.

[5] W.-C. Li, "Extension of compressive sampling for eddy current 3D reconstruction," M.S. thesis, National Taiwan University, 2024. DOI: 10.6342/NTU202400686.

[6] W.-C. Li and C.-Y. Lin, "Extension of compressive sampling to binary vector recovery for model-based defect imaging," *arXiv preprint arXiv:2412.01055*, 2024. DOI: 10.48550/arXiv.2412.01055.

Research Experience

Research Assistant, Trustworthy Robotics Lab, Georgia Tech Aug. 2025 - present

– Implemented a discrete elastic rod model with a convex contact formulation to simulate manipulation of ropes, shoelaces, and other slender deformable objects.

– Developed a differentiable simulator incorporating smoothed contact dynamics and geometries for gradient-based planning.

– Derived analytical model error bounds and leveraged robust planning methods to ensure constraint satisfaction under nonsmooth dynamics.

Research Assistant, NTU July 2022 - June 2025

– Developed a comprehensive framework to tackle the NP-hard problem of binary vector recovery in underdetermined linear systems.

– Applied the method to eddy current defect imaging, improving sampling efficiency in nondestructive testing.

– Implemented a mixed integral-differential "distributed current source" method to model eddy currents.

Awards and Honors

HIWIN Best Master's Thesis Award 2025

Professor Lung-Wen Tsai Memorial Scholarship 2024

Presidential Award (top 5% in grades) for 5 semesters, National Taiwan University 2017 - 2021