Wei-Chen Li

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Education

National Taiwan University   *Sept 2022 – Aug 2024*
MS in Mechanical Engineering
- GPA: 3.93/4.0
- Thesis title: Extension of compressive sampling for eddy current 3D reconstruction PDF ↗

National Taiwan University   *Sept 2017 – June 2021*
BS in Mechanical Engineering
- GPA: 3.96/4.0 (Rank: 3/142)

Publications

- <u>W. C. Li</u> and C. Y. Lin, "Extension of compressive sampling to binary vector recovery for model-based defect imaging," Under review. PDF ↗
- <u>W. C. Li</u> and C. Y. Lin, "Eddy current defect tomography using a hybrid binary vector recovery algorithm," Under review. PDF ↗
- <u>W. C. Li</u> and C. Y. Lin, "Sparse magnetic array for the imaging of defects in multilayer metals," *IEEE Sensors Journal*, vol. 24, no. 9, pp. 14082-14092, 2024. PDF ↗
- <u>W. C. Li</u> and C. Y. Lin, "Unit interval vector recovery from sparse measurements for eddy current defect imaging," In *The 21th International Conference on Automation Technology*, 2024. PDF ↗
- C. Y. Lin, <u>W. C. Li</u>, H. T. Chen and Y. L. Chen, "Inverse modeling based on eddy current sensing for reconstruction of conductivity distribution," In *The 19th International Conference on Automation Technology*, 2022. PDF ↗

Experience

Full-time Research Assistant   *Aug 2024 – present*
Mechatronics and Intelligent Automation Research Lab, National Taiwan University
- Developed a comprehensive framework for recovering binary vectors from underdetermined systems of linear measurements
- Proved the NP-hard nature of the problem and designed approximate solvers using convex optimization and Bayesian inference
- Applied the framework to various measurement modalities for defect tomography imaging

Research Assistant   *July 2022 – June 2024*
Mechatronics and Intelligent Automation Research Lab, National Taiwan University
- Proposed an algorithm based on variational inference for binary vector recovery from linear measurements
- Apply the method to model-based eddy current defect imaging, improving sampling efficiency
- Implemented a mixed integral-differential method called "distributed current source" to model eddy currents

Teaching Assistant   *Sept 2022 – June 2023*
Department of Mechanical Engineering, National Taiwan University
- Assisted in teaching *Dynamics* and *Automatic Control* course
- Assigned and graded homeworks assignments and exams while holding regular TA sessions

Engineering Intern   *Mar 2022 – June 2022*
Techman Robotics
- Developed graphical user interface for robotic systems product
- Built a robot simulator using the product of exponentials formulation

Private   *Sept 2021 – Feb 2022*
ROC Army

- Conscription military service

Student Researcher   *July 2020 – Jan 2021*
Robotics Lab, National Taiwan University
- Port monocular SLAM to an Android phone
- Integrated camera and IMU data for navigation in GPS-denied environments

Awards and Honors

HIWIN Best Master's Thesis Award (3000$ prize)	*2024*
Best Paper Award (Second Prize), The 21th International Conference on Automation Technology	*2024*
Professor Lung-Wen Tsai Memorial Scholarship	*2024*
Best Paper Award (Third Prize), The 19th International Conference on Automation Technology	*2022*
Presidential Award (top 5% in grades) for 5 semesters, Department of Mechanical Engineering, National Taiwan University	*2017 – 2021*

Skills

Programming: C++/C, Python, MATLAB, Julia, LaTeX

Toolkit: PyDrake, PyTorch, Git, Altium Designer, Autodesk Inventor

Knowledgeable methods:

	General	Graphs	Controls	Neural networks
Probabilistic	Variational inference, MCMC	Probabilistic graphical models (Belief propagation)	State estimation (Kalman filter, Particle filter)	DDPM, VAE
Convex optimization	ADMM, Interior-point	Graph of convex sets	Optimal control (LQR, DDP, MPC)	-