Danyang Li

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EDUCATION

Boston University — Boston, MA
Ph.D., Mechanical Engineering — June 2025 (expected)

University of Pennsylvania — Philadelphia, PA
M.Sc., Electrical Engineering — 2020

Beihang University — Beijing, China
B.Sc., Automation Science and Electrical Engineering — 2018

University of Illinois at Urbana-Champaign — Champaign, IL
Summer Program at School of Information Sciences — 2017

RESEARCH EXPERIENCE

Graduate Research Assistant, Boston University — Boston, MA
Robotics Lab, Advisor: Roberto Tron — September 2020 - Present

- Proposed TLINet, an interpretable neural network based on formal language with template-free modeling, offering insights into network functioning.
- Implemented TLINet for data classification by leveraging its capabilities to differentiate data based on spatial and temporal characteristics.
- Developed a deep learning architecture for interpretable imitation learning, enabling simultaneous feature extraction and control policy synthesis directly from data.
- Collaborated with members from MIT Lincoln lab and Lehigh University. Conducted bi-weekly progress update sessions.

Graduate Research Assistant, University of Pennsylvania — Philadelphia, PA
mLAB, Advisor: Rahul Mangharam — May 2019 - May 2020

- Managed a sequential planning method for safe planning and control for multi-drone systems based on signal temporal logic and model predictive control.
- Assembled F-330 drones and conducted various missions using the drones with autopilot flight controllers and optical flow camera.

Undergraduate Research Assistant, UC Berkeley — Berkeley, CA
Lin Lab, Advisor: Yong Cui and Liwei Lin — July 2017 - October 2017

- Proposed a theoretical model to analyze noise features on graphene for gas identification.
- Conducted experiments to measure graphene noise responses to various gases, utilizing MATLAB for remote experiment control and data analysis.
- Demonstrated exceptional gas sensing capabilities with graphene field-effect transistors, showcasing attributes such as low baseline drift, high sensitivity, and strong linearity.
- Awarded provisional patent (2019).

Undergraduate Research Assistant, Beihang University — Beijing, China
Advisor: Zongxia Jiao — September 2016 - November 2016

- Conducted preprocessing on raw aircraft speed data to improve data quality by reducing noise and handling missing data.
- Analyzed and categorized common failures in speed detection systems to enhance system reliability and performance.
- Developed a real-time failure detection system using a window-sliding method, currently under operation and providing failure warnings in aircraft speed detection.

TEACHING EXPERIENCE

Graduate Teaching Assistant, Boston University Boston, MA
Course: ME310 Instrumentation September 2021 - May 2022

- Led weekly lab sessions for 30 students, managing lab setup, troubleshooting, and answering questions.
- Guided students through the final project, clarifying concepts and assisting with implementation.
- Graded lab reports and exams, providing constructive feedback.
- Received an overall rating of 4.6/5 from students.

WORKING EXPERIENCE

Research Intern Beijing, China
StepVR March 2018 - June 2018

- Processed and annotated videos of falling behaviors to generate training data for an image-based detection system.
- Implemented a real-time pose estimation algorithm for identifying body, foot, hand, and facial keypoints for accurate tracking of individuals in images.
- Trained a 3D convolutional neural network on surveillance camera footage to effectively detect falling incidents in real-time scenarios.

HONORS & AWARDS

Distinguished Mechanical Engineering Fellowship 2020
Boston University

Dean's List 2019
University of Pennsylvania

Best Undergraduate Thesis Award 2018
Beihang University

The Stars in Electrical Engineering 2017
Beihang University

Yuanhang Fellowship 2016
Beihang University

Weimin Scholarship 2015
Beihang University

JOURNAL PUBLICATIONS

[J1]. **D. Li**, M. Cai, C.Vasile and R. Tron. TLINet: Differentiable neural network temporal logic inference. *IEEE Transactions on Automatic Control*, 2024. [Under Review]

CONFERENCE PUBLICATIONS

[C3]. **D. Li**, M. Cai, C.Vasile and R. Tron. Learning signal temporal logic through neural network for interpretable classification. In *2023 American Control Conference (ACC)*, pages 1907–1914, 2023

[C2]. **D. Li** and R. Tron. Multi-Class Temporal Logic Neural Networks. In *2024 American Control Conference (ACC)*, pages 5155–5162, 2024

[C1]. W. Liu*, **D. Li***, E. Aasi, R. Tron and C. Belta. Interpretable generative adversarial imitation learning. *arXiv preprint arXiv:2402.10310*, 2024

WORKSHOPS & PRESENTATIONS

- **D. Li** and R. Tron, "Inference and Prediction with Neural Networks based on Temporal Logic," *CISE Graduate Student Workshop 2024 (CGSW 10.0)*, Jan 26, 2024, Boston University.
- **D. Li** and R. Mangharam, "Autonomous Air Traffic Control: The Fly-by-Logic Approach," *PRECISE's 6th Annual Industry Day Conference*, Oct 25, 2019, University of Pennsylvania.

PATENT APPLICATIONS

[P1]. **D. Li** and Y. Cui. "Fast response method for graphene gas sensor based on bandwidth-enhanced", Publication Number: CN108828023A

PROFESSIONAL ACTIVITIES

Leadership

Student Host, Learning to Trust Autonomy Workshop
Volunteer, CISE Graduate Student Workshop 2024 (CGSW 10.0)

Reviewer for

IEEE American Control Conference (ACC), IEEE Conference on Decision and Control (CDC), IEEE International Conference on Learning for Dynamics & Control (L4DC)

Mentoring

Master student at Upenn: Yide Zhao

SKILLS

Developer Tools: Python (proficient); Pytorch (proficient); C/C++ (experienced); MATLAB (experienced); ROS (experienced);
Analytical: Neural networks; temporal logic; optimization; controls; automata theory; control barrier function.
Languages: English; Chinese.