HAMED DAMIRCHI

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EDUCATION

University of Adelaide Adelaide, Australia
Ph.D. in Computer Science *Jun. 2023 – 2026*
Thesis: Towards Compositional Learning

K. N. Toosi University of Technology Tehran, Iran
M.Sc. in Mechatronics Engineering *Sep. 2018 – Sep. 2021*
Thesis: Factor Graph Assisted Deep Multi-Modal Localization of a Cable Driven Parallel Robot

Tabriz University Tabriz, Iran
B.Sc. in Mechanical Engineering *Sep. 2013 – Apr 2018*
Thesis: Multi-Modal Fusion for Quadrotor Attitude Estimation

PUBLICATIONS

- **H. Damirchi**, C. Rodríguez-Opazo, E. Abbasnejad, D. Teney, J. Qinfeng Shi, S. Gould, A. van den Hengel, "Zero-shot Retrieval: Augmenting Pre-trained Models with Search Engines", 2024

- AF Bavil, **H. Damirchi**, H. D. Taghirad, "Action Capsules: Human skeleton action recognition", Computer Vision and Image Understanding, 2023

- **H. Damirchi**, F. Agostinelli, P. Jamshidi, "Independent Modular Networks", ICRA23 RAP4Robots Workshop (ICRAW), 2023

- **H. Damirchi**, R. Khorrambakht, H. D. Taghirad, B. Moshiri, "A Consistency-Based Loss for Deep Odometry Through Uncertainty Propagation", IEEE International Conference on Robotics and Automation (ICRA), 2023

- S. A. Khalilpour, R. Khorrambakht, **H. Damirchi**, H. D. Taghirad, P. Cardou, "Tip-trajectory tracking control of a deployable cable-driven robot via output redefinition", Multibody system dynamics, 2021

- **H. Damirchi**, R. Khorrambakht, H. D. Taghirad, "ARC-Net: Activity Recognition Through Capsules", International Conference on Machine Learning and Applications (ICMLA), 2020

- **H. Damirchi**, R. Khorrambakht, H. D. Taghirad, "ARAS-IREF: An Open-Source Low-Cost Framework for Pose Estimation", International Conference on Robotics and Mechatronics (Best poster paper award), 2019

RESEARCH AND WORK EXPERIENCE

Learning Causal Mechanisms Instead of Causal Variables AISys @ University of South Carolina
Researcher *2022-2023*

- Proposed a novel approach to shift the focus of causal learning from a variable/graph based view to mechanism based view inline with the developing approaches related to the independent causal mechanisms hypothesis

Localization Stack for Safe Autonomous Vehicle Navigation ARAS Labs
Researcher *2020-2022*

- Led a team of 2 researchers and proposed an uncertainty-aware localization subsystem for long-term and short-term odometry pipelines aimed at self-driving vehicles

Prevention of Corneal Diseases Through Weakly Supervised Learning ARAS Labs
Researcher *2021-2022*

- Led a team of 3 researchers and collected real-world data in collaboration with specialists and surgeons with the goal of designing a weakly supervised approach for detection of corneal diseases such as Keratoconus.

Stock Direction Forecasting   ARAS Labs
Researcher   *2020*

- Used historical data alongside sentiment analyses of Reddit and major news sources to predict the direction of the stock. Cross-modal attention based Transformer and RNN based pipelines were compared against classical time series forecasting methods such as SARIMAX.

Universal End-Effector   ARAS Labs
Researcher   *2019*

- An end-effector for a 4-cable parallel robot was designed in order to house a sensor array and allow for data collection.
- A DAQ system was also devised where a node was mounted with each anchor point and the CAN protocol was used to transfer data from each actuator to the central system.

Design of a Full-Stack Quadrotor Flight Controller System   Tabriz University Robotics Group
Researcher   *2016-2018*

- Designed a quadrotor flight controller subsystem consisting of a custom add-on on top of a BeagleBone Black board alongside a custom front-end and backend for the control software.

Skills

- **Programming Languages:** Python (Advanced), C (Intermediate), C++ (Intermediate), Matlab (Intermediate), MicroPython (Intermediate), Clojure (Basic), JS (Basic)
- **Development Platforms:** PyTorch (Advanced), TensorFlow (Intermediate), Keras (Intermediate), Qt (Basic), ROS (Intermediate), GTSAM (Intermediate)
- **Embedded Platforms:** Keil+HAL Libraries (Intermediate), Arduino (Advanced)
- **Developer Tools:** Git (Advanced), Docker (Intermediate), GCP (Basic), AWS (Basic)
- **CAD/CAM:** CATIA (Advanced), SolidWorks (Advanced), Altium Designer (Intermediate), Fusion 360 (Intermediate)

Teaching Experience

- **2015, Tabriz University, Iran:** Teaching Assistant, Robotics, Faculty of Mechanical Engineering

    - Assisted in the development of course materials and grading.
    - Conducted lab sessions and helped students with practical assignments.

- **2016, Tabriz University, Iran:** Tutor, Introduction to Robotics, Scientific Association of Mechanical Engineering Department

    - Delivered tutorials on basic concepts of robotics.
    - Provided additional support to students through one-on-one sessions.

- **2017, Tabriz University, Iran:** Teaching Assistant, Robotics, Faculty of Mechanical Engineering

    - Developed and graded assignments and exams.
    - Led discussion groups and provided feedback to students on their projects.

- **2017, Tabriz University, Iran:** Tutor, Programming with C++, Scientific Association of Mechanical Engineering Department

    - Conducted programming workshops focusing on C++.
    - Assisted students in developing their coding skills and understanding of programming concepts.