

# TSUNG-CHI LIN, PH.D.

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## RESEARCH INTERESTS

My research centers on three aspects of human-robot interaction: (1) evaluating the **human-robot interfaces** that are intuitive to learn and effective to complete tasks, (2) establishing **human-robot communication** via multimodal sensory feedback that enables transparent human-robot collaboration, and (3) designing **robot autonomy and interface assistance** that augments task performance and ease of operational efforts.

## EDUCATION

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|---|-------------|
| <b>Worcester Polytechnic Institute (WPI)</b> , Worcester MA, USA<br><i>Ph.D. in Robotics Engineering</i><br><i>Advisor: Jane Li</i> | 2018 - 2023 |
| <b>National Taiwan University (NTU)</b> , Taipei, Taiwan<br><i>M.S. in Biomedical Engineering</i>                                   | 2012 - 2014 |
| <b>Yuan Ze University (YZU)</b> , Taoyuan, Taiwan<br><i>B.S. in Mechanical Engineering</i>  | 2008 - 2012 |

## PUBLICATIONS

### Journal Articles

- [J4] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Perception and Action Augmentation for Teleoperation Assistance in Freeform Tele-manipulation](#)", *ACM Transactions on Human-Robot Interaction (THRI)*, 2024.
- [J3] **T. C. Lin**, A. U. Krishnan and Z. Li, "[The Impacts of Unreliable Autonomy in Human-Robot Collaboration on Shared and Supervisory Control for Remote Manipulation](#)", *IEEE Robotics and Automation Letters (RA-L)*, 2023.
- [J2] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Perception-Motion Coupling in Active Telepresence: Human Behavior and Teleoperation Interface Design](#)", *ACM Transactions on Human-Robot Interaction (THRI)*, 2023.
- [J1] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Intuitive, Efficient and Ergonomic Tele-Nursing Robot Interfaces: Design Evaluation and Evolution](#)", *ACM Transactions on Human-Robot Interaction (THRI)*, 2022.

### Refereed Full Conference Papers

- [C12] **T. C. Lin**, J. T. Chen and C. M. Huang, "Reducing Performance Variability and Overcoming Limited Spatial Ability: Targeted Training for Remote Robot Teleoperation", *submitted to IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024.
- [C11] A. U. Krishnan, **T. C. Lin** and Z. Li, "[Human Preferred Augmented Reality Visual Cues for Remote Robot Manipulation Assistance: from Direct to Supervisory Control](#)", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023.
- [C10] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Comparison of Haptic and Augmented Reality Visual Cues for Assisting Tele-manipulation](#)", *International Conference on Robotics and Automation (ICRA)*, 2022.
- [C9] A. U. Krishnan, **T. C. Lin** and Z. Li, "[Design Interface Mapping for Efficient Free-form Tele-manipulation](#)", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022.

- [C8] **T. C. Lin**, A. U. Krishnan and Z. Li, "[How People Use Active Telepresence Cameras in Tele-manipulation](#)", *International Conference on Robotics and Automation (ICRA)*, 2021.
- [C7] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Shared Autonomous Interface for Reducing Physical Effort in Robot Teleoperation via Human Motion Mapping](#)", *International Conference on Robotics and Automation (ICRA)*, 2020.
- [C6] **T. C. Lin**, A. U. Krishnan and Z. Li, "[Physical Fatigue Analysis of Assistive Robot Teleoperation via Whole-body Motion Mapping](#)", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019.

### Short Conference Papers

- [C5] J. D. Li, M. Y. Kuo, **T. C. Lin**, Y. H. Wu and T. W. Lu, "Skin Movement Artifacts Affect Calculated Knee Kinematics and Kinetics During Cycling", *International Scientific Meeting on Biomechanics*, 2014.
- [C4] J. D. Li, M. Y. Kuo, T. W. Lu, **T. C. Lin**, Y. H. Wu and H. C. Hsu, "Differences of Skin Movement Artifacts during Loaded and Unloaded Cycling Exercise on the thigh and shank Using 3D Fluoroscopy", *The 1st Global Conference on Biomedical Engineering (GCBME) conjunction with 9th Asian-Pacific*, 2014.
- [C3] J. D. Li, T. W. Lu, M. Y. Kuo, Y. H. Wu, **T. C. Lin** and H. C. Hsu, "Effects of Skin Movement Artifacts on Kinematics and Kinetics of the Knee During Cycling", *The 1st Global Conference on Biomedical Engineering (GCBME) conjunction with 9th Asian-Pacific*, 2014.
- [C2] J. D. Li, T. W. Lu, Y. H. Wu, M. Y. Kuo, **T. C. Lin**, C. C. Lin, Y. H. Liu and H. C. Hsu, "Effects of Soft Tissue Artifacts on the Calculated Kinetic Variables of the Knee during Cycling", *13th International Symposium on 3D Analysis of Human Movement*, 2014.
- [C1] J. D. Li, Y. H. Wu, T. W. Lu, **T. C. Lin**, M. Y. Kuo, C. C. Lin, Y. H. Liu and H. C. Hsu, "Comparisons of Knee Joint Loading Between Forward and Backward Pedaling on an Instrumented Cycling Ergometer Using 3D Fluoroscopy Method", *7th World Congress of Biomechanics*, 2014.

### Patent

- [P1] **T. C. Lin**, J. L. Pan, K. J. Pai, Z. W. Liao, Y. C. Chang, S. H. Tzao, & C. Y. Liu, "Muscle training equipment, muscle training system and muscle training method", *U.S. Patent No. 11,065,506*, 2021.

### Theses

- [T2] Ph.D. Dissertation  
**T. C. Lin**, "[Human-Robot Interfaces to Enable Effective and Effortless Control for Remote Manipulation of Tele-nursing Robot](#)", *Department of Robotics Engineering, Worcester Polytechnic Institute*, 2023.
- [T1] M.S. Thesis  
**T. C. Lin**, "[Three-Dimensional Finite Element Analysis of the Knee Ligaments During Cycling in Normal Young Subjects](#)", *Department of Biomedical Engineering, National Taiwan University*, 2014.

## HONORS AND AWARDS

<b>John C. Malone Postdoctoral Fellowship</b> – Johns Hopkins Malone Center for Engineering in Healthcare	2023
<b>Postdoctoral Fellowship</b> – WPI Robotics Engineering, USA	2023
<b>Best Poster Award</b> – WPI Graduate Research Innovation Exchange (GRIE) poster competition, USA	2020
<b>The R&amp;D 100 Award</b> - The R&D 100 Awards Committee and R&D Magazine, USA	2016
<b>Outstanding Research Award</b> - Industrial Technology Research Institute (ITRI), Taiwan	2015
<b>Excellent Award</b> - Prospective Creative Competition, ITRI, Taiwan	2015
<b>Research Scholarships</b> - Ministry of Science and Technology, Taiwan	2013 & 2014

**Best Poster Award** - Annual Symposium on Biomedical Engineering & Technology, Taiwan 2013  
**Excellent Award** – Creative Application of Solar Energy Competition, Ministry of Education, Taiwan 2012

## WORK AND RESEARCH EXPERIENCE

**Intuitive Computing Laboratory**, Johns Hopkins University, Baltimore MD, USA 2023 - Current  
*John C. Malone Postdoctoral Fellow led by Chien-Ming Huang*

**Human-inspired Robotics (HiRo) Lab**, WPI, Worcester MA, USA 2023  
*Postdoctoral Fellow led by Jane Li*

**Human-inspired Robotics (HiRo) Lab**, WPI, Worcester MA, USA 2020 - 2023  
*Research Assistant led by Jane Li*

**Industrial Technology Research Institute (ITRI)**, Hsinchu, Taiwan 2014 - 2018  
*Associate Researcher (R&D Substitute Military Service)*

**Orthopaedic Engineering & Movement Analysis Lab**, NTU, Taipei, Taiwan 2012 - 2014  
*Graduate Researcher advised by Tung-Wu Lu*

## TEACHING EXPERIENCE

**Guest Lecturer**, WPI, Worcester MA, USA Fall 2020  
*RBE 526-191 Human-Robot Interaction*

**Teaching Assistant**, WPI, Worcester MA, USA Spring 2020  
*RBE 595-191 Sp Top: Humanoid Robotics*

**Lab Instructor**, WPI, Worcester MA, USA Fall 2019  
*RBE 3001 Unified Robotics III: Manipulation*  
*RBE 3002 Unified Robotics IV: Navigation*

**Teaching Assistant**, WPI, Worcester MA, USA Spring 2019  
*RBE 502-191 Robot Control*

## ACADEMIC SERVICE

**Journal Article Referee**  
ACM Transactions on Human-Robot Interaction (THRI)  
IEEE Robotics and Automation Letters (RA-L)

**Conference Paper Referee**  
International Conference on Intelligent Robots and Systems (IROS) 2024  
International Conference on Robotics and Automation (ICRA) 2022 - Current  
International Conference on Human-Robot Interaction (HRI) 2022 - Current  
International Conference on Ubiquitous Robots (UR) 2020 & 2021

**Organizer for Conference and Workshop**  
Robotics: Science and Systems (RSS) [Workshop on Social Intelligence in Humans and Robots](#) 2024

## TECHNICAL SKILLS

**Programming** ROS / Python / MATLAB / C / C++ / C# / FORTRAN

**Software** Unity / Vicon Nexus 2.0 / Vicon Workstation / OpenSim / EMGworks

**Design & Simulation** SolidWorks / Pro E / Inventor / ABAQUS / ANSYS