Tuan Dang

Resume

SUMMARY

I'm working on a Rosie robot (Baxter-based robot) toward my Ph.D. under Dr. Manfred Huber 's supervision. This robot combines two 7-DOF arms and AGVs as its base. Rosie has three distributed computers, five RGB cameras, RGB-D camera, IMUs, and a Velodyne Lidar. A battery powers the robot and wirelessly communicates with other computing devices (mobile/PC/laptop) for monitoring and controlling tasks. The project aims to teach this robot to perceive 3D environments and perform service tasks safely.

EDUCATION

- 2021-present PhD, Computer Science & Engineering, University of Texas at Arlington, USA
 Dissertation: 3D Object Recognition, Mapping, and Manipulation for Mobile Cobot
 Graduation : Spring 2025 (Expected)
 Committee : Dr. Manfred Huber (advisor), Dr. Farhad Mamangar, Dr. David Levine, Dr. William Beksi
- 2011 2013 Master of Engineering, Sungkyunkwan University,South Korea Thesis: A gateway for multi-devices between Mechatrolink-III and RS-485 Advisor : Dr. Jae Wook Jeon
- 2005 2010 Bachelor, Computer Science & Engineering, Back Khoa Ho Chi Minh, Vietnam Thesis: T-Engine Smartphone (Score : 10/10) ⇒ Youtube Advisor :Dr. Duc-Anh-Vu Dinh

EXPERIENCES

- 2021-present **University of Texas at Arlington**, *Research Assitant/Teaching Assistant* Conduct Research Projects and assist teaching courses.
- 2016 2020 Presto Solution, South Korea, Project Manager Developed motion controller and robot controllers: https://www.tuandang.info/portfolio.html
- 2014 2015 **Pham Van Dong University, Vietnam**, *Lecturer* Taught courses and Coached Olympic Students.
- 2011 2013 **Sungkyunkwan University, South Korea**, *Research Assistant* Worked on automation control network based research projects.
- 2010 2011 Renesas Semiconductor, Vietnam, Embedded Software Engineer Developed 3D embedded software to coordinate hardware accelerators using OpenGL ES for Android 2.3.

PUBLICATIONS

- 2024 Khang Nguyen, Tuan Dang, and Manfred Huber. Volumetric mapping with panoptic refinement using kernel density estimation for mobile robots. In *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1782–1788. IEEE, 2024.
- 2024 Khang Nguyen, Tuan Dang, and Manfred Huber. Real-time 3d semantic scene perception for egocentric robots with binocular vision. *arXiv preprint arXiv:2402.11872*, 2024.
- 2024 Tuan Dang, Khang Nguyen, and Manfred Huber. V3d-slam : Robust rgb-d slam in dynamic environments with 3d semantic geometry voting. In 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pages 1782–1788. IEEE, 2024.

- 2023 Harish Ramachandramoorthy, Tuan Dang, Ankitha Srinivasa, Kytai Truong Nguyen, and Phuc Nguyen. Development of a smart portable hypoxic chamber with accurate sensing, control and visualization of in vitro cell culture for replication of cancer microenvironment. *Cancers*, volume 15, page 3645. MDPI, 2023.
- 2023 Khang Nguyen, Tuan Dang, and Manfred Huber. Online 3d deformable object classification for mobile cobot manipulation. In *ISR Europe 2023; 56th International Symposium on Robotics*, pages 139–146. VDE, 2023.
- 2023 Tuan Dang, Khang Nguyen, and Manfred Huber. Perfc: An efficient 2d and 3d perception software-hardware framework for mobile cobot. In *The International FLAIRS Conference Proceedings*, volume 36, 2023.
- 2023 Tuan Dang, Khang Nguyen, and Manfred Huber. Multiplanar self-calibration for mobile cobot 3d object manipulation using 2d detectors and depth estimation. In *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1782–1788. IEEE, 2023.
- 2023 Tuan Dang, Khang Nguyen, and Manfred Huber. Extperfc: An efficient 2d and 3d perception hardware-software framework for mobile cobot. *arXiv preprint arXiv:2306.04853*, 2023.
- 2022 Tuan Dang, Trung Tran, Khang Nguyen, Tien Pham, Nhat Pham, Tam Vu, and Phuc Nguyen. iotree: a battery-free wearable system with biocompatible sensors for continuous tree health monitoring. In *Proceedings of the 28th Annual International Conference on Mobile Computing And Networking*, pages 352–366, 2022.
- 2013 Jin Ho Kim, Dang Thanh Tuan, Jae Wook Jeon, and Bok Sun Yeom. Design of a seamless gateway for mechatrolink? In 2013 IEEE International Conference on Industrial Technology (ICIT), pages 1246–1251. IEEE, 2013.
- 2013 Tuan Thanh Dang, Jin Ho Kim, and Jae Wook Jeon. Performance analysis of mechatrolink-iii. In 2013 11th IEEE International Conference on Industrial Informatics (INDIN), pages 152–157. IEEE, 2013.
- 2012 Tuan Thanh Dang, Jin Ho Kim, Dung Duc Nguyen, and Jae Wook Jeon. A gateway for multi-device communication between mechatrolink-iii and rs-485. In 2012 12th International Conference on Control, Automation and Systems, pages 294–299. IEEE, 2012.

SERVICES

REVIEW CONFERENCES

- The IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023, 2024)
- Ubiquitous Robots (UR 2024)
- IEEE International Conference on Robotics and Automation (ICRA 2024)
- The 2023 International Symposium on Electrical and Electronics Engineering (ISEE 2023)
- Winter Conference on Applications of Computer Vision (WCACV 2024)
- Asian Conference on Intelligent Information and Database Systems $(14^{th}, 15^{th})$ REVIEW JOURNALS
- IEEE Robotics and Automation Letters (RA-L 2023, 2 rounds)
- IEEE Transaction Mobile Computing 2023 (TMC, 2 rounds)
- REV Journal on Electronics and Communications 2023

AWARDS

- May 2024 Graduate Dean's 2024 Summer Research Assistantships, UTA
- Sept 2023 Travel Grant from IROS 2023, Detroit, USA
- Sept 2023 Travel Grant from CSE Dept/Dean Office, UT Arlington, USA
- May 2023 Travel Grant from UT Arlington, UT Arlington, USA

- Oct 2022 Outstanding Teaching Assistant Award, UT Arlington, USA
- 2017,2018 Outstanding Employee, South Korea
 - 2008 Second place Robotcon at HCMUT, Vietnam
 - 2008 First prize Software NXP Semiconductor Competition, Vietnam
 - 2008 Third prize Hardware NXP Semiconductor Competition, Vietnam

PROJECTS

- 2022-present **3D perception, mapping, and navigation for mobile cobot**, *UTA* **Roles**: Implement algorithms for 3D perception and build topological map for navigation **Resource links**: Software Frame Work | Robot Self-Calibration | V3D-SLAM
 - 2021-2022 Localize Drone using acoustic signals, UTA Roles: Build Hardware for data collection with 5 microphone
 - 2021-2023 Hypoxia Chamber: Hypoxia Chamber for Cell Culture for Replication of Cancer Microenvironment, UTA

Roles: Built control and learning algorithms, cloud storage, and visualization interface

- 2021-2022 **IoTree: A Battery-free Wearable System with Biocompatible Sensors for Tree Health Monitoring**, *UTA* **Roles:** Led a team to build a prototype (hardware, firmware, and PC software) from scratch **Resource links:** Paper | Github | Video
- 2020-2021 **CNC Machine**, *South Korea* **Roles**: Build motion algorithm for CNC machine, support G-Code
- 2019-2020 Develop Teaching Pendant for Robot Controller, South Korea Roles: Using Linux kernel (ARM Family) and Qt12 for 7 inches version, and No-OS (STM32F Family) for 5 inches version
- 2018-2019 **Develop new Programming Language for Robot Controller**, *South Korea* **Roles**: Designed and implemented a new Language that facilitates Linux-based robot controller
- 2018-2019 **Porting Robot Controller for x86, ARM and RT-Linux, Xenomai2, 3**, *South Korea* **Roles**: Ported EtherLab, Simple Open EtherCat Master, and Acontis software (Linux-based Software Stack)
- 2017-2018 **Develop Samsung SDC Mark III robot**, *South Korea* **Roles**: Develop motion algorithms for motion controller
- 2016-2017 **Developing EtherCat IO slave support CoE/FoE**, *South Korea* **Roles**: Designed hardware and firmware for EtherCat Slave Controller using ET1100 and MCU PIC24
- 2013-2016 Educational projects, Vietnam
 - **Roles 1**: Coached students in competing at **Olympic Vietnam Information** and ACM Asia Contests **Roles 2**: Researched and presented work at domestic conferences
 - Roles 3: Guided students on research and taught coursework (Algorithms, Operating Systems)

2011-2013 Automotive projects under master program, South Korea
 Roles 1: Designed and implemented a motor driver for multi-industrial network protocols such as EtherCat, Mechatrolink-II, Mechatrolink-III, Ethernet PowerLink, CAN, RS232, RS485, I/O
 Roles 2: Designed and implemented a gateway between a traditional fieldbus network (RS-485) and an Ethernet-based network (Mechatrolink-III)
 Roles 3: Developed this virtual sensor network for unmanned cars to reduce testing costs in the real environment
 2010-2011 Renesas projects, Vietnam

Roles: Built 3D Cube app that boost the system performance using hardware accelerator

2008-2010 **Robocon**, *Vietnam* **Roles**: Led a team to design mechanical, electrical, and embedded components for the contests **Resource link**: \Rightarrow Youtube

TEACHING ASSISTANTSHIPS

Spring 2024 CSE 3310: Software Engineering, UTA
Fall 2023 CSE 5305: Foundation of Graduate Level Studies in Computer Science, UTA
Spring 2023 CSE 6363: Machine Learning, UTA
Fall 2022 CSE 5334: Data Mining, UTA
Summer 2022 CSE 5331: Theory of Database, UTA
Fall 2021 CSE 4334: Data Mining, UTA
Spring 2021 CSE 3318: Algorithms and Data Structures, UTA

MENTORING

REFEREES

Dr. Manfred Huber

Professor, Department of Computer Science & Engineering University of Texas at Arlington ⊠ mailto:huber@cse.uta.com

Dr. Farhad Mamangar

Professor, Department of Computer Science & Engineering University of Texas at Arlington ⊠ mailto:kamangar@uta.edu

Dr. William Beksi

Professor, Department of Computer Science & Engineering University of Texas at Arlington ⊠ mailto:william.beksi@uta.edu