Han (Helen) Zhang

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Education

Tsinghua University 2014-2016, 2018-2020, 2021-2023

B.E. in Department of Electronic Engineering *GPA: 3.7/4.0*

Gap years in 2016-2018 and 2020-2021 in two startup companies as a co-founder.

Selected Coursework: Motorsport Engineering(A+), Mobile Intelligent Robot(A+), Humanoid Soccer Robot(A), Manufacturing Process Design(A+), Microcontrollers and Embedded Systems(A), Electronic System Design(A), Complex Analysis(A), Linear Algebra(A), Calculus(A), Physics(A+), Quantum Mechanics(A)

Experience

Research Assistant | *IIIS, Tsinghua University* 2022-Present

- Advised by Prof. Huazhe Xu.
- Author of ArrayBot, 9DTact and DOGlove.
- Contributes to the design of new hardware devices in the laboratory.

CTO | *Jaresh Tech Inc.* 2020-2021

- A startup company focused on next-generation XR glasses.
- Lead the Engineering Verification Test (EVT) and Design Verification Test (DVT) of the product prototype.
- Develop the circuits, mechanical structures, CV and SLAM algorithms.
- Obtain an authorized patent (CN202130465143.0).

Co-Founder | *Dexta Robotics Inc.* 2016-2018

- A startup company specializing in easy-to-use force feedback glove.
- Raise over $1.5M angel round from Grainsvalley Ventures and Sunwoda (A Public company).
- Design the circuits, embedded systems, C# API, and Unity applications.

Research Interests

Robotics

- Robot System Design (Full-stack, both hardware and software parts); Robot Learning; Manipulation

Human Computer Interaction

- Force and Texture Feedback; Mixed Reality (AR/VR/XR)

Honors & Awards

RoboCup @Home Open Platform, *Rank 7* 2019

The RoboCup@Home is the largest international annual competition for autonomous service robots.

National Scholarship, *Top 5%* 2018

For inspiring undergraduates to study hard and develop morally, intellectually, and physically.

GIX Innovation Competition, *The Second Prize* 2018

A worldwide event, invited young innovators to develop projects for ubiquitous computing, and related fields.

iF Design Award, *Product/Industry* 2018

The iF Design Award stands as one the most prestigious design awards in the world.

RedDot Award, *Product Design Award* 2017

The Red Dot Design Award is one of the world's largest design competitions for product design.

International Design Contest (IDC) Robocon, *The Third Prize* 2016

International teams of students take part of the contest, designing and building remotely controlled robots.

Fellowship of Spark Talents Program, *50 recipients in Tsinghua per year* 2016
The program selects top undergraduates with academic potential and enhances their innovative abilities.

Tsinghua Artificial Intelligence Design Contest, *Rank 6* 2015
This contest requires participants to develop AI programs for machine-machine gameplay.

Tsinghua Electronic Design Contest, *Championship* 2014
One of the university's top competitions challenges participants to design a robot car for a designated task.

Publications

ArrayBot: Reinforcement Learning for Generalizable Distributed Manipulation through Touch ICRA 2024
Z Xue*, H Zhang*, J Cheng, Z He, Y Ju, C Lin, G Zhang, H Xu Website

9DTact: A Compact Vision-Based Tactile Sensor for Accurate 3D Shape Reconstruction and Generalizable 6D Force Estimation RAL 2023
C Lin, H Zhang, J Xu, L Wu, H Xu Website

Projects

DexUMI: Manipulation Interface for Dexterous Hand | *Advised by Prof. Shuran Song* Jun.2024-Present
- Contributing to the design and development of hardware components for DexUMI.

DOGlove: An Open-source Force Feedback Glove | *Advised by Prof. Huazhe Xu* Feb.2024-Present
- Developing a glove featuring 21 DoF motion capture and 5 DoF force feedback.
- Responsible for designing circuits, 3D-printed structures, embedded systems, and retargeting algorithms.
- Will be open-sourced soon; check our website.

Tinker: Service Robot at Home Oct.2014-Jul.2024
- Team Tinker is an project-based team that participates in numerous worldwide competitions annually.
- From 2014 to 2017, I was in charge of circuit design.
- From 2018 to 2019, I served as team leader and robot system designer.
- Since 2023, I've been responsible for mechanical and circuit design, as well as chassis ROS API.
- Since 2024, I've led LLM-based mobile manipulation tasks.

Self-coordinated Vehicle Formation | *Advised by Prof. Yuan Shen* Oct.2015-Mar.2017
- We use ultra-wideband (UWB) wireless technology to measure the distance between any two robot cars, eliminating the need for a base station to localize any car. The cars self-coordinate to determine their positions.
- Design the circuits, mechanics, and embedded systems of robot cars.
- Develop the UWB communication protocols.
- Design the self-coordinated algorithms.
- Formulate the formation strategies; Project website.

Skillset

Language & Tools: C/C++, Python, C#, Matlab, Verilog, PyTorch, OpenCV, Qt5, Unity, ROS, webots, Gazebo
Hardware Design: Altium Designer, Solidworks, AutoCAD, 3D Printing, CNC, Arduino, STM32, RaspberryPi
Creative: Adobe Photoshop, LightroomClassic, PremierePro, AfterEffects, Audition