

# Luzhe Sun

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🔗 Github link

🌐 Website link

## EDUCATION BACKGROUND

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### Toyota Technological Institute at Chicago

*Ph.D. Student in Computer Science*

Chicago, US

Sept 2023 - Present

### University of Chicago

*Master Program in Computer Science | GPA: 3.77/4.00*

Chicago, US

Sept 2021 - Mar 2023

### Xiamen University

*Bachelor of Software Engineering, Graduate with Honor*

Xiamen, China

Sept 2017 - Jul 2021

Overall GPA: 3.74/4.00 Top:4/125 Major GPA: 3.92/4.00

## PUBLICATIONS

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### • "To the Noise and Back: Diffusion for Shared Autonomy" Published at RSS 2023

Takuma Yoneda, **Luzhe Sun**, Ge Yang, Bradly Stadie, Matthew Walter

### • "Decompositional Quantum Graph Neural Network"

Xing Ai, **Luzhe Sun**, Junchi Yan, Zhihong Zhang and Edwin Hancock

## RESEARCH EXPERIENCE

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### 3D Scene Navigation via LLMs | Research Assistant

Sept 2023- Present

*Advisor: Matthew Walter | Director, Robot Intelligence through Perception Laboratory, TTIC*

- Construct 3D dynamic scene graph through cloud mesh
- Frontier based object navigation reasoning over LLMs
- fine-tune LLMs with self-correction strategy for shortest path navigation

### Shared Autonomy on Robotics Trajectory | Research Assistant

Jun 2022-Mar 2023

*Advisor: Matthew Walter | Director, Robot Intelligence through Perception Laboratory, TTIC*

- Robot trajectory prediction using diffusion models and visualisation in simulator
- User manipulation correction using conditional diffusion model

### Directed Acyclic Graph Learning | Research Assistant

March 2022 - Jun 2022

*Advisor: Bryon Aragam | Assistant Professor, Booth School of Business, University of Chicago*

- Use marginal normalization flow to predict distribution of single vertex
- Use GAN to distinguish the mimic data by normalization flow and real distribution

### Deep Multi-Fidelity Gaussian Process | Research Assistant

Jun 2020 - Dec 2020

*Advisor: Guang Lin | Director, Data Science Consulting Service, Associate Professor, Purdue University*

- Combine deep neural network methods with multi-dimensional Gaussian process to improve the Co-Kriging method
- Construct the multi-fidelity deep Gaussian process prediction framework
- Modify the network structure and loss function, and improve the R2 score of the prediction result from a negative number to 0.61

### Quantum Graph Neural Network | Research Assistant

Jun 2019 - Jan 2020

*Advisor: Zhihong Zhang | Associate Professor, Xiamen University*

- Construct and adjust the quantum bit circuit; Test the impact of different circuit structures on the mutag dataset
- Reconstruct the pooling layer of quantum graph neural network and develop subgraph cutting method to process graph on quantum framework
- Redesign the encode layer. Increase the accuracy from 0.62 to 0.91

## SELECTED PROJECTS

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- Code As Policy on UR5 | Invited demonstration at MSI Robot Block Party 2023** 2023
- Implemented the Code as Policies algorithm on the UR5 robot.
  - Respond to the user's voice command and execute the corresponding task.
- Baxter Pose Following | Invited demonstration at MSI Robot Block Party 2023** 2023
- Use RTMPose-m for detecting human poses in crowds.
  - Empower the Baxter robot to follow a human's pose in real time.
- AI Travel Assistant** *link* 2019
- Image recognition based attraction introduction, photo recognition text translation
  - Restaurant and accommodation recommendations and rating system

## SKILLS

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- **Programming:** Python, C/C++, SQL, HTML
- **Coding Frameworks:** PyTorch, TensorFlow, SpringBoot, Quantum Computing
- **Tools/Platform:** Git, Docker, Xcode, MATLAB, Navicat, Unity, Postman

## AWARDS & ACHIEVEMENTS

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- Honored Graduates Student, Xiamen University 2021
- **National Scholarship** (TOP 0.2% nationwide), Chinese Ministry of Education 2020
- **National Scholarship** (TOP 0.2% nationwide), Chinese Ministry of Education 2019
- **National Second Prize** of China Undergraduate Mathematical Contest in Modeling 2019
- **National Third Prize** of China Students Service Outsourcing Competition 2019
- Huang Xilie Scholarship of Xiamen University in 2019 (2/200) 2019
- The First Prize Scholarship, Xiamen University 2018
- Xiamen University Social Work Scholarship 2018

## LEADERSHIP EXPERIENCE

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- Student Union, Software School | Vice President Jun 2018 - Oct 2019
- Publicity Center, Software School | Center Leader Jun 2018 - Oct 2019
- Debate Team, Software School | Team Leader May 2018 - Jun 2019
- Class Three of Software School (Undergraduates of 2017) | Monitor Oct 2017 - Jun 2021

## VOLUNTEER EXPERIENCE

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- Girls Who Code** | Volunteer Chicago, 2024
- Exhibit robotics demo to Girls Who Code, a coding program for elementary school girls.
  - Assistant TTIC DEI team to work on teaching GWC coding program.
- 4th China "Internet +" College Students Innovation and Entrepreneurship Competition**
- Leader of Volunteers in Computer Science Department Xiamen, 2019
- Coordinate the layout of the venue. Result statistics and on-site scheduling of branch venues.
  - Assist the IT department of the competition to provide information technology support.
- Xiamen University "Deep Love for Medicine"** | Volunteer Activity Sponsor Xiamen, 2018
- Communicate with the hospital to establish a summer division of labor for 28 volunteers.
  - Help patients to go through the registration, reimbursement and payment process faster and easier.