

Xiangfei Kong

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Research Interests

Area: Human-Robot Interaction (HRI). Augmented Reality (AR). Robotics

Education

University of South Florida <i>Ph.D. Computer Science</i>	Aug 2025 – Present <i>Tampa, FL, USA</i>
University of South Florida <i>M.S. Computer Science</i>	Aug 2023 – July 2025 <i>Tampa, FL, USA</i>
University of South Florida <i>Pathway to Computing Graduate Certification</i>	Aug 2022 – May 2023 <i>Tampa, FL, USA</i>
University of South Florida <i>M.S. Marketing</i>	Aug 2021 – July 2025 <i>Tampa, FL, USA</i>
Qufu Normal University <i>B.A. Teaching Chinese As a Foreign Language</i>	Aug 2005 – Jun 2009 <i>Qufu, Shandong, China</i>

Research Experience

Ph.D. Computer Science Researcher <i>Reality, Autonomy, and Robot Experience (RARE) Lab</i>	Aug 2025 – Present <i>Tampa, FL, USA</i>
<ul style="list-style-type: none">– Designing an open-source social robot to reduce social isolation among older adults through touch interaction and conversational AI.– Integrating large language models (LLMs) to enable customized, meaningful conversations based on user preferences and history.– Collaborating with Communication faculty to evaluate the effectiveness of social robots in supporting emotional and cognitive well-being in older adults.– Conducting interdisciplinary research at the intersection of AI, HRI, and healthcare to develop adaptive, empathetic robotic systems for eldercare.	
M.S. Student with Thesis Option <i>Reality, Autonomy, and Robot Experience (RARE) Lab</i>	Oct 2024 – Aug 2025 <i>Tampa, FL, USA</i>
<ul style="list-style-type: none">– Conducted literature reviews directed by Dr. Zhao Han.– Designed experiment conditions to compare physical and AR Fetch robot manipulation and navigation.– Implemented conditions using ROS(melodic), Gazebo, Unity, and fkie_multimaster in Ubuntu.	

Publication

- **Xiangfei Kong**, Zhao Han. "Do Results in Experiments with Virtual Robots in Augmented Reality Transfer To Physical Robots? An Experiment Design" - *4th Workshop YOUR Study Design! Participatory critique and refinement of human-robot interaction user studies, 2024*

Service

Student Volunteer <i>19th Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI)</i>	Mar 2024 <i>Boulder, CO, USA</i>
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Scholarship

Rada Scholarship in AI and Healthcare <i>University of South Florida Foundation</i>	2025-2026 <i>Tampa, FL, USA</i>
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Teaching Experience

Teaching Assistant <i>University of South Florida</i>	Oct 2024 – Present <i>Tampa, FL, USA</i>
<ul style="list-style-type: none">– COP4600 Operating Systems (90 students, Fall 2024)– CIS3433 System Integration & Architecture (68 students, Spring 2025)	

- Supported students by holding office hours to address lecture and homework questions.
- Graded assignments and exams. Communicated with instructors about student learning feedback.

Instructor - College Chinese

Qilu Institute of Technology

Sep 2009 – May 2015

Qufu, Shandong, China

- Instructed college students through lectures, hands-on projects, and assigned reading and writing assignments.
- Led engaging classrooms with dynamic group discussions.
- Utilized teaching assistants for orderly and adaptive teaching.

Mentoring

James Yab

RARE Lab

Jan 2024 – Aug 2024

Tampa, FL, USA

- Assisted student in understanding and following operating guidelines for the Fetch Mobile Manipulator robot.
- Guided the use of rosbridge to integrate Unity with ROS and Gazebo for robotic simulation and control.

Dev Thakkar

RARE Lab

Aug 2024 – Nov 2024

Tampa, FL, USA

- Mentored a student in configuring ROS connections within Unity and adjusting the virtual robot model to match physical counterparts visually.

Vlad Krukhmalev, Tu Nguyen

RARE Lab

Dec 2024 – Aug 2025

Tampa, FL, USA

- Mentored two CS undergraduate students in learning Robot Operating Systems (ROS) (Beginner level).
- Guided students in learning and implementing GitHub project workflows and pull request processes.
- Assisted students in developing the Unity project for deployment on HoloLens 2, including project setup, Mixed Reality Toolkit (MRTK) integration, and application deployment.
- Guided students in learning and working with the fkie_multimaster package to establish one-way synchronization of specific ROS topics and nodes between two ROS hosts.

Andrew Teixeira, Rex Allen Gonzalez, Deep Akbari, Sofia Cobo Navas, Thuc Anh Nguyen

RARE Lab – Social Robot Project

May 2025 – Present

Tampa, FL, USA

- Supervised a team of five undergraduate students on the development of a socially assistive robot to support older adults.
- Advised on robot shell design to ensure user acceptance while allowing proper integration of all hardware components.
- Guided the implementation of speech-to-text modules and robot emotional motion design for natural and engaging interactions.
- Mentored the development of text-to-speech functionality and custom LLM prompts for personalized dialogue generation.
- Supported camera-based face recognition pipeline development for context-aware human-robot interaction.
- Mentored UI design (Flask) and development for user information input, ensuring accessibility and ease of use for the experimenter.

Work Experience

Research Assistant

University of South Florida – RARE Lab

May 2025 – Present

Tampa, FL, USA

- Mentored undergraduate students on robotics and AI-related projects.
- Assisted with day-to-day lab management and coordination of research activities.

Website Developer - Internship

Central Distro Inc.

May 2024 – Aug 2024

Orlando, FL, USA

- Collaborated on GitHub by creating branches, managing pull requests, and updating tasks.
- Updated and maintained websites by fixing over 30 bugs using Python.

Business Owner

Xiangfei Catering

May 2015 – July 2019

Qufu, Shandong, China

- Recruited qualified manager candidates with skills in financial management, recruitment, and warehouse management.
- Supervised managers by conducting assessments based on store revenue and online and in-store customer reviews.

Projects

Augmented Reality Game Design

Nov 2023

- Collaborated in a team of three to design an Augmented Reality (AR) game using Unity and Vuforia.
- Implemented virtual buttons for character combat initiation and healing functionality with C#.
- Enhanced virtual coherence through shadow.

FOON Knowledge Representation for Robots

Oct 2023

- Implemented Iterative Deepening and Greedy Best-First Search algorithms to extract task trees from Functional Object-Oriented Network (FOON).
- Optimized the success rate of motion or input objects within the function unit, enhancing the robot's ability to comprehend and execute cooking tasks efficiently.

Reinforcement Learning Project

Nov 2023

Based Object Mixing in CoppeliaSim

- Implemented a Reinforcement Learning agent within CoppeliaSim to achieve uniform mixing objects in a container.
- Implemented the Q-Learning algorithm to develop the initial model, generating a Q-table for the specific task.
- Transitioned to a Deep Q-Network (DQN) agent, demonstrating a strategic algorithm selection process.

Control of Mobile Robot Lab Project

Nov 2023

Based robot vehicle driving safe and reach the destination across various maps in Webots

- Developed Go-to-Goal PID control in Python for autonomous robot navigation in Webots.
- Integrated obstacle avoidance to improve safety around map walls and maze structures.
- Implemented Bug Zero algorithm with sensor-based navigation and statistical analysis across multiple environments.

Skills

- **Operating System:** Linux (Ubuntu)
- **Programming Languages:** Python, C++, C#, HTML, R
- **IDEs and Tools:** CLion, Visual Studio Code, GitHub
- **Simulation Tools:** Gazebo, Webots, CoppeliaSim
- **AR/VR Development:** Unity, Vuforia, MRTK (Mixed Reality Toolkit), HoloLens 2
- **Robotics Platforms and Frameworks:** Fetch Mobile Manipulator, ROS(melodic), MoveIt, fkie_multimaster
- **AI and ML Tools:** OpenAI API (LLM prompt engineering), Whisper (STT), Vosk (TTS), PyTorch