Xingpeng Sun

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EDUCATION

Purdue University **09/2023-05/2028**

Doctor of Philosophy in Computer Science West Lafayette, IN

- Research Interest: Large-Language Model, Robotics, Graphics, Safe and Trustworthy Learning
- Advisor: Aniket Bera

University of Wisconsin-Madison **09/2019-12/2022**

Bachelor of Science Madison, WI

- Majors: Computer Science (Distinction in Major), Mathematics
- GPA: 3.97/4.00; Graduated with Distinctive Scholastic Achievement, Dean's List (6 semesters)

PUBLICATION

- *TrustNavGPT*: Trust-Driven Audio-Guided Robot Navigation under Uncertainty with Large Language Models

  ***Xingpeng Sun**, Yiran Zhang, Xindi Tang, Amrit Singh Bedi, Aniket Bera*

  IROS 2024 (Oral)

  An LLM-based audio-guided navigation agent that uses affective cues in spoken communication—elements such as tone and inflection that convey meaning beyond words—allowing it to assess the trustworthiness of human commands and make effective, safe decisions. Experiments across a variety of simulation and real-world setups show a 70.46% success rate in catching command uncertainty and an 80% success rate in finding the target, 48.30%, and 55% outperform existing LLM-based navigation methods, respectively. Additionally, *TrustNavGPT* shows remarkable resilience against adversarial attacks, highlighted by a 22%+ less decrease ratio than existing LLM navigation in success rate.

- *Beyond Text*: Improving LLM's Decision Making for Robot Navigation via Vocal Cues

  ***Xingpeng Sun**, Haoming Meng, Souradip Chakraborty, Amrit Singh Bedi, Aniket Bera*

  Under Review

  Preprint arXiv: 2402.03494; Under Review

- DL3DV-10K: A Large-Scale Scene Dataset for Deep Learning-based 3D Vision

  CVPR 2024

  *Lu Ling, Yichen Sheng, Zhi Tu, Wentian Zhao, Cheng Xin, Kun Wan, Lantao Yu, Qianyu Guo, Zixun Yu, Yawen Lu, Xuanmao Li, **Xingpeng Sun**, Rohan Ashok, Aniruddha Mukherjee, Hao Kang, Xiangrui Kong, Gang Hua, Tianyi Zhang, Bedrich Benes, Aniket Bera*

INTERNSHIP EXPERIENCE

Tencent Americas, Lightspeed Studios

06/2024 - 08/2024

Research Intern Bellevue, WA

- Performed 3D meshes geometric segmentation based on large image-language foundation model.
- Researched on the intersection of computer graphics and LLMs to design algorithms for 3D assets in simulation and game that utilize foundation models.

RESEARCH INTEREST

My research interest is in large language model, robotics, graphics, AI embodied agent, and AI safety. I am eager to work on the intersection of large language model (LLM) + X and has focused on advancing the capabilities and safety of autonomous systems through enhanced natural language understanding and decision-making processes in my PhD research.

UNDERGRADUATE RESEARCH EXPERIENCE

Center for Computational Biology and Bioinformatics, Indiana University School of Medicine
05/2022 - 08/2022
Data Science Intern Indianapolis, IN

- Proposed statistical methods to discover the implication of brain cell DNA's functional 3'-untranslated region variants on substance use disorders.
- Built a multi-task statistical model to analyze both the gene expression level and novel variant's impact of brain cell sequences.

Connected and Automated Vehicle Highway Group, UW-Madison **01/2022 - 05/2022**
Undergraduate Research Assistant Madison, WI

- Implemented longitudinal and lateral vehicle system to control the throttle, brake, and steer of the connected automated vehicle (CAV) and directed the CAV to drive along a list of waypoints.
- Formulated sampling-based planning algorithms and map grid systems for collaborative automated driving in the CARLA environment.

TEACHING EXPERIENCE

Graduate Teaching Assistant **09/2023 – 05/2024**
Department of Computer Science @ Purdue University West Lafayette, IN

- Led a 4-hour lab session and 2-hour office hour per week to teach undergraduate students about data structure for CS176 Data Engineering in Python and CS 177 Programming with Multimedia Objects.

Peer Mentor (Undergraduate Teaching Assistant) **01/2021 – 05/2021**
Department of Computer Science @ University of Wisconsin-Madison Madison, WI

- Held 7 office hours per week and answered hundreds of Piazza questions for CS540 Introduction to Artificial Intelligence.
- Instructed 300+ undergraduate students to learn course materials and debug programming homework.

TECHNICAL SKILLS

Programming Language: Python, Java, JavaScript, C, C++, MATLAB, SQL, HTML, Julia, R

Frameworks: TensorFlow, Keras, SciKit-learn, PyTorch, Pandas, OpenCV, React, Spring Boot

Tools: Git, Visual Studio, LaTeX, Jira, Figma, Agile, MySQL, AWS

HONORS and AWARDS

Purdue CS Graduate Student Teaching Assistantship, Recipient 2023
UW-Madison Ralph B. Abrams Scholarship, Recipient 2022
FIS InnovateIN48 Hackathon Student Edition, 3rd Place Team Captain 2021
UW-Madison Undergraduate Scholarship for Summer Study, Recipient 2020