

# Jyun - Ting Song

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## Research Interests

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**Fields:** Computer Vision, Robotics, Machine Learning

**Topics:** Human Pose Estimation, Contact Detection, Physics Simulation

## Education

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### Carnegie Mellon University

M.S. in Robotics, Cumulative GPA: 3.8/4.0

Advisor: Prof. **Kris Kitani**

Sept 2023 – present

### National Taiwan Normal University

M.S. in Electrical Engineering, GPA: 4.21/4.3

Advisor: Prof. **Jacky Baltes**

Sept 2021 – Jan 2023

### National Taiwan Normal University

B.S. in Electrical Engineering, GPA: 3.8/4.3

Advisor: Prof. **Jacky Baltes**

Sept 2017 – May 2021

## Research Experience

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### Video - based Human - Object Contact Detection

Aug 2024 - Present

- Constructing a multi-view video dataset with human-object contact annotations
- Developing a method to robustly detect the contact state of a human over time

### Multi-Human 3D Reconstruction from In-the-Wild Videos

Oct 2023 - Jun 2024

- Constructed a large-scale 3D multi-human dataset with diverse dynamic activities
- Generated human-related annotations (3D poses and human meshes) from multi-view videos

### Balancing Control for a Humanoid Agent in a Dynamic Environment

Jan 2022 - Jan 2023

- Designed RL algorithm structure based on Proximal Policy Optimization (PPO) to train a humanoid agent to play a balance board in a simulation environment (Isaac Gym)

### An Olympics Sports Humanoid Robot

Sept 2019 - July 2021

- Developed versatile humanoid robot that could perform skills of Olympic sports events such as archery, basketball, weightlifting, sprint and marathon

## Publications

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\* indicates equal contribution

### [1] **Harmony4D: A Video Dataset for In-The-Wild Close Human Interactions**

Rawal Khirodkar\*, **Jyun - Ting Song\***, Jinkun Cao, Zhengyi Luo, Kris Kitani

*Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024*

### [2] **Reinforcement Learning and Action Space Shaping for Humanoids in Highly Dynamic Environment**

**Jyun - Ting Song**, Guilherme Christmann, Jaesik Jeong, Jacky Baltes

*Springer's Studies in Computational Intelligence (SCI), 2023*

### [3] **The Corsmal Benchmark for the Prediction of the Properties of Containers**

Alessio Xompero, et al.

*IEEE Access, 2022*

### [4] **Interactive Card Magic with Humanoid Robot** (A technical report)

**Jyun - Ting Song**, Jacky Baltes

*FIRA World Summit, 2021*

## Work Experience

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### Graduate Research Assistant

Carnegie Mellon University

Pittsburgh, USA

Oct 2023 – present

### Teaching Assistant - Reinforcement Learning

National Taiwan Normal University

Taipei, Taiwan

Sep 2022 – Jan 2023

### Research Assistant

National Taiwan Normal University

Taipei, Taiwan

Sep 2021 – Jan 2023

## Competitions & Awards

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**1st Place**, All-Round, HuroCUP, FIRA RoboWorld Cup 2022

July 2022

- **1st Place** in Basketball and Weightlifting, **2nd Place** in Sprint and Archery [\[link\]](#)

**1st Place**, IJCAI 2021 - Robot Magic and Music Competition

Aug 2021

- Developed a humanoid robot that could perform interactive card magic [\[link\]](#)

**2nd Place**, Basketball, FIRA SimulCup 2021

July 2021

- Developed a humanoid that could grab and dunk a ball with 98% accuracy [\[link\]](#)

**2nd Place**, ICPR 2020 - CORSMAL Challenge

Sept 2020

- Estimated mass, type, and fill level of containers using multimodal dataset (visual, audio) [\[link\]](#)

**1st Place**, Archery, Taiwan Humanoid 2020

July 2020

- Developed a humanoid robot to autonomously shoot an arrow at a moving target [\[link\]](#)

## Skills & Interests

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**Languages:** Mandarin Chinese (native), English (fluent)

**Programming:** Python, C++, C, HTML, LaTeX

**Platforms & Tools:** PyTorch, Keras, OpenCV, Scikit-learn, NumPy, Pandas, Matplotlib, Open3D, ROS

**Interests:** Basketball, Guitar, GO