

Ruihan Gao

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA, USA

Ph.D. in Robotics

Sep. 2021 – . Present

- GPA: 4.00 / 4.00
- Advisor: [Prof. Jun-Yan Zhu](#), [Prof. Wenzhen Yuan](#)

Nanyang Technological University (NTU), Singapore

B.Eng in Electrical and Electronic Engineering

Aug. 2016 – Jun. 2020

- GPA: 4.99 / 5.00, Rank: 1 / ~ 500, graduated with Honors (Highest distinction)
- Advisor: [Prof. Zhiping Lin](#)

SELECTED PUBLICATIONS

- [1] Guying Lin, Kemeng Huang, **Ruihan Gao**, Michael Liu, Hanke Chen, Beijia Lu, Taku Komura, Yuan Liu, Jun-Yan Zhu, Minchen Li, "PhysScene: Physics-Augmented Text-to-3D Scene Generation", in submission.
- [2] **Ruihan Gao**, Kangle Deng, Gengshan Yang, Wenzhen Yuan, Jun-Yan Zhu, "Tactile DreamFusion: Exploiting Tactile Sensing for 3D Generation", Conference on Neural Information Processing Systems (NeurIPS), 2024.
- [3] **Ruihan Gao**, Wenzhen Yuan, Jun-Yan Zhu, "Controllable Visual-Tactile Synthesis", IEEE/CVF International Conference on Computer Vision (ICCV), 2023.
- [4] **Ruihan Gao**, Tian Tian, Zhiping Lin, Yan Wu, "On Explainability and Sensor-Transferability of a Robot Tactile Texture Representation Using a Two-Stage Recurrent Networks", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- [5] **Ruihan Gao**, Tasbolat Taunyazov, Zhiping Lin, Yan Wu, "Supervised Autoencoder Joint Learning on Heterogeneous Tactile Sensory Data: Improving Material Classification Performance", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
- [6] Tasbolat Taunyazov, Yansong Chua, **Ruihan Gao**, Harold Soh, Yan Wu, "Fast Texture Classification Using Tactile Neural Coding and Spiking Neural Network", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
- [7] Weichao Zhou, **Ruihan Gao**, BaekGyu Kim, Eunsuk Kang, Wenchao Li, "**Runtime-Safety-Guided Policy Repair**", International Conference on Runtime Verification (RV), pp. 131–150, Springer, 2020.
- [8] **Ruihan Gao**, Jiawei Peng, Long Nguyen, Yunfeng Liang, Steven Thng, Zhiping Lin, "Classification of Non-Tumorous Facial Pigmentation Disorders using Deep Learning and SMOTE", IEEE/RSJ International Symposium on Circuits and Systems (ISCAS), 2019.
- [9] Long Nguyen, **Ruihan Gao**, Dongyun Lin, Zhiping Lin, "Biomedical Image Classification Based on a Feature Concatenation and Ensemble of Deep CNNs", Journal of Ambient Intelligence and Humanized Computing, 2019.
- [10] Jiawei Peng, **Ruihan Gao**, Long Nguyen, Yunfeng Liang, Steven Thng, Zhiping Lin, "Classification of Non-Tumorous Facial Pigmentation Disorders using Improved SMOTE and Transfer Learning", IEEE International Conference on Image Processing (ICIP), 2019.

PROJECTS / COMPETITION ACCOMPLISHMENTS

Haptic rendering of sloshing liquid in a bottle with Magnetic Levitation Device

16-855 Special Topic: Tactile Sensing and Haptics

Sept. 2022 – Dec. 2022

- Integrated a physics-based simulation of sloshing liquid in a shaking bottle with the Magnetic Levitation Haptic Device (MLHD).
- Designed and conducted a user study to evaluate the haptic rendering.

International Robomasters Competition

Leader of Electrical Group of NTU Team

Jan. 2017 – Jun. 2018

- Led a multidisciplinary team of 15 members to design a formation of eight Unmanned Ground Vehicles.
- Developed STM32 microcontroller for vehicle shooting, climbing, and box-grabbing.
- Awarded the third prize among international teams.

HONORS & REWARDS

National Science Scholarship (5-yr funding for Ph.D. study)	2020
Lee Kuan Yew Gold Medal (top 1 among the undergraduate cohort)	2020
NTU Science and Engineering Scholarship (4-yr funding for undergrad study)	2016-2020
KUKA Innovation Award (Finalist) with Team CHRIS at A*STAR	2021
PREMIA (Pattern Recognition and Machine Intelligence Association) Best Student Presentation Award	2021
Dean's List (undergraduate)	2016, 2017

TEACHING EXPERIENCE

16-825 Learning for 3D Vision, Carnegie Mellon University

Teaching Assistant

Jan. 2024 – May. 2024

16-720 Computer Vision, Carnegie Mellon University

Teaching Assistant

Aug. 2023 – Dec. 2023

16-855 Tactile Sensing and Haptics, Carnegie Mellon University

Teaching Assistant - Developed lab sessions for haptic rendering devices

Sep. 2022 – Dec. 2022

OUTREACH ACTIVITIES

TechNight Session on Generative Models

Jan. 2022 – Apr. 2022; Sep. 2024 – Nov. 2024

- Designed the online tutorial [Intro to Neural Networks and Generative Models](#).
- Reached out to middle school students to expand the diversity of interest in computing among them.
- Co-designed an one-hour session to teach middle school students, mostly from underrepresented population, about classification in computer vision.
- Co-designed multiple interactive activities that guide them to develop a traffic sign classifier in class.

Vice President, Da Vinci 3D Printing and Robotics Society

Aug. 2017 – May. 2019

- Coordinated two 3D Printing and Robotics Workshops; 30 students attended and built their first self-designed 3D-printed car in groups of two.
 - Organized three outreach exhibitions at local high schools; instructed over 200 students to operate robots.
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SERVICE

Reviewer for CVPR, ICCV, SIGGRAPH, RAL, IRCA, IROS, AAAI, etc.

MENTORSHIP

Undergraduate Students: Tian Tian(NTU), Kaela Marsheck (CMU, Summer AI mentoring program)

Programs for Graduate Students: RoboBuddy, Path to AI Research (PAIR) program, the Graduate Application Support Program (GASP) for applicants from traditionally underrepresented backgrounds.