

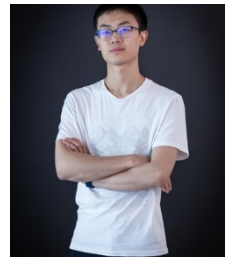
## Yang Chen

Visiting Post-doc (ETH Zurich), JSPS Research Fellow (PD)

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### Summary

I am a robotics researcher and life-long learner. I obtained Ph. D. degree in human informatics from University of Tsukuba in March 2023 and currently working as a visiting post-doc at ETH Zurich and research fellow (PD) of Japan Society for the Promotion of Science (JSPS). My research interests include but are not limited to human augmentation, human-robot interaction, mobile robotics, teleoperation, human sensing, assistive technology, shared control, etc.

Research goal: Use robotics technology to empower humans.

### Working experience

- **ETH Zurich** *June.2023-Dec. 2023*  
Visiting post-doc  
Lab: SMS Lab & SCAI Lab  
Research topic: Shared control for a holonomic wheelchair  
Hosted by: Prof. [Robert Riener](#) & Dr. [Diego Paez-Granados](#)
- **Japan Society for the Promotion of Science (JSPS)** *Apr. 2023-Mar. 2024*  
Research fellow (PD)  
Hosted by: Prof. [Kenji Suzuki](#)
- **Japan Society for the Promotion of Science (JSPS)** *Apr. 2022-Mar. 2023*  
Research fellow (DC)
- **University of Tsukuba** *Apr. 2020-Nov. 2021*  
Research Assistant

### Education

- **Jilin University** *Sep. 2013-Jun. 2017*  
Bachelor of Engineering in Mechanical Engineering (Excellent Engineers Training Program, Ministry of Education)  
Supervised by Prof. [DongF. Wang](#)  
Bachelor thesis: *Explore the Way of Designing the Piezoelectric Dividing Structure to Both Realize the Stress Distributing Evenly and Achieve Largest Output Voltage*
- **University of Tsukuba** *Oct. 2017-Apr. 2018*  
Research student
- **University of Tsukuba** *Apr. 2018-Mar. 2020*  
Master of Human Informatics  
Master thesis: *Torso Control System and Autonomous Docking Support for a Standing Mobility Device*
- **University of Tsukuba** *Apr. 2018-Mar. 2023*  
Ph. D Program in Empowerment Informatics  
Doctoral thesis: *A Study on Upper-body based Shared Navigation Control for Assistive Mobility Devices*  
Supervised by Prof. [Kenji Suzuki](#)

### Internship

- **École polytechnique fédérale de Lausanne (EPFL)** *Aug. 2019-Oct. 2019*  
Lab: Learning Algorithm and System Laboratory (LASA)  
Research topic: *Autonomous docking system for a standing mobility device*  
Supervised by Prof. [Aude Billard](#)
- **National Institute of Advanced Industrial Science and Technology (AIST)** *Aug. 2021-Present*  
Lab: CNRS-AIST JRL (Joint Robotics Laboratory),  
Research topic: *Complementary SLAM for Immersive Teleoperation with A Humanoid*  
Supervised by Prof. [Fumio Kanehiro](#)

### Main Projects

- **Shared control for a holonomic wheelchair** *Jun. 2023-Present*

This work aims to propose a shared control framework for a holonomic wheelchair to improve user's experience.

- **Wearable Mobility Device Adapting to User's Natural Posture Changes** *Aug. 2019-Present*  
In this work, we aim to realize a novel concept of a personal mobility device design that combines the agile mobility of a wheel type mechanism but does not limit a human's natural stair climbing ability.
- **Control interface for hands-free navigation of personal mobility vehicles** *Oct. 2017-Present*  
This work aims to explore an intuitive and simple control interface for personal mobility devices that would allow hands-free locomotion.
- **Virtual landmark-based control of docking support for assistive mobility devices** *Oct. 2018-Present*  
This work proposes an autonomous docking support approach for assistive mobility devices like intelligent wheelchairs to assist the user in approaching a rest surface, such as a chair or bed. A stable nonlinear feedback control is constrained to field of view (FOV) by transforming the target volume to a virtual landmark pose. The effectiveness is demonstrated with a real-time implementation on a standing mobility vehicle - Qolo, using embedded RGBD sensing.
- **Enhanced Visual Feedback with Decoupled Viewpoint Control in Immersive Humanoid Robot Teleoperation using SLAM** *Aug. 2021-Present*  
This work aims to enhance the tele-visualization experience for the operator in humanoid robot teleoperation, we construct a virtual space for decoupled viewpoint control, and we use a prebuilt mesh to complement the real-time point cloud to reduce the visual latency.

## Publication

- Y. Chen, D. Paez-Granados, M. Hassan, and K. Suzuki, "Upper-Body Based Control Interface with compliant coupling support for Assistive Mobility Devices", IEEE/ASME Transactions on Mechatronics, 2023. **(In preparation)**
- Xiaoxi Zhang, Y. Chen, M. Hassan, and K. Suzuki, "Development of a Hands-free Human-guided Smart Stroller Using a UWB Localization System", Sensors, 2023. **(In preparation)**
- R. Cisneros-Limón, A. Dallard, M. Benallegue, K. Kaneko, H. Kaminaga, P. Gergondet, A. Tanguy, Rohan P. Singh, L. Sun, Y. Chen, C. Fournier, M. Tsuru, Sélime C. Moussaoui, G. Lorthioir, Y. Osawa, G. Caron, M. Morisawa, A. Escande, K. Ayusawa, I. Kumagai, M. Ono, K. Shirasaka, S. Wada, H. Wada, F. Kanehiro and A. Kheddar, "A cybernetic avatar system to embody human telepresence for connectivity, exploration and skill transfer" International Journal of Social Robotics, 2023. **(Under review)**
- Y. Chen\*, T. Kuwahara\*, Y. Nishimura†, K. Suzuki, "WeMo: A Prototype of Wearable Mobility Device Adapting to User's Natural Posture Changes", Sensors, 2023. **(Peer-reviewed, [link](#))**
- R. Cisneros, A. Dallard, M. Benallegue, K. Kaneko, H. Kaminaga, P. Gergondet, A. Tanguy, C. Fournier, Rohan P. Singh, Y. Chen, Sélime C. Moussaoui, G. Lorthioir, Y. Osawa, M. Tsuru, L. Sun, M. Morisawa, G. Caron, F. Kanehiro, A. Kheddar, "Enhancement of Team JANUS' cybernetic avatar system for exploration and skill transfer", *ICRA 2023 Workshop Toward Robot Avatars*. **(Peer-reviewed, [link](#))**
- Santiago P. Torrendell, Y. Chen, H. Kadone, M. Hassan, K. Suzuki, "Design of a Multi-Degree-of-Freedom Elastic Neck Exoskeleton for Persons with Dropped Head Syndrome", 6th IEEE-RAS International Conference on Soft Robotics (RoboSoft), 2023. **(Peer-reviewed, [link](#))**
- Y. Chen, L. Sun, M. Benallegue, R. Cisneros-Limón, Rohan P. Singh, K. Kaneko, A. Tanguy, G. Caron, K. Suzuki, A. Kheddar, and F. Kanehiro, "Enhanced Visual Feedback with Decoupled Viewpoint Control in Immersive Humanoid Robot Teleoperation using SLAM," IEEE-RAS International Conference on Humanoid Robots (Humanoids), 2022. **(Peer-reviewed, [link](#))**
- R. Cisneros, M. Benallegue, K. Kaneko, H. Kaminaga, G. Caron, A. Tanguy, R. Singh, L. Sun, A. Dallard, C. Fournier, M. Tsuru, C. Yang, Y. Osawa, G. Lorthioir, F. Kanehiro, A. Kheddar. "Team JANUS Humanoid Avatar: A cybernetic avatar to embody human telepresence". *RSS 2022 Workshop on "Towards Robot Avatars: Perspectives on the ANA Avatar XPRIZE Competition"*, New York City, U.S.A., 2022. **(Peer-reviewed, [link](#))**
- D. Paez-Granados, H. Kadone, M. Hassan, Y. Chen, & K. Suzuki, "Personal Mobility With Synchronous Trunk-Knee Passive Exoskeleton: Optimizing Human-Robot Energy Transfer", IEEE/ASME Transactions on Mechatronics, 2021. **(Peer-reviewed, IF = 5.673, [link](#))**
- Y. Chen, D. F. Paez Granados, B. Leme and K. Suzuki, "Virtual Landmark Based Control of Docking Support for Assistive Mobility Devices," in IEEE/ASME Transactions on Mechatronics, doi: 10.1109/TMECH.2021.3081426. **(Peer-reviewed, IF = 5.673, [link](#))**
- Y. Chen, D. Paez-Granados, H. Kadone and K. Suzuki, "Control Interface for Hands-free Navigation of Standing Mobility Vehicles based on Upper-Body Natural Movements," 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020, pp. 11322-11329, doi: 10.1109/IROS45743.2020.9340875. **(Peer-reviewed, [link](#))**
- Y. Chen, D. Paez-Granados, and K. Suzuki, "Holistic body machine interface solution for standing mobility vehicle for the lower-body impaired-integrating autonomous docking system-," in The Proceedings of JSME annual Conference on Robotics and Mechatronics (Robomec) 2020. The Japan Society of Mechanical Engineers, 2020, pp. 2P1-D10. **(Non-peer-reviewed, [link](#))**.

- Y. Chen, D. Paez-Granados and K. Suzuki, "Torso Control System with A Sensory Safety Bar for a Standing Mobility Device," 2019 International Symposium on Micro-NanoMechatronics and Human Science (MHS), 2019, pp. 1-5, doi: 10.1109/MHS48134.2019.9249303. **(Peer-reviewed, [link](#))**
- Y. Liu, Y. Chen et al., "Developing MEMS electric current sensors for end use monitoring of power supply: Part VIII - segmentation design and empirical analysis of piezoelectric layers based on cantilever beam structure," 2018 Symposium on Design, Test, Integration & Packaging of MEMS and MOEMS (DTIP), 2018, pp. 1-4, doi: 10.1109/DTIP.2018.8394240. **(Peer-reviewed, [link](#))**

#### Presentation at international conference

- Y. Chen, M. Hassan, D. Paez-Granados, Yosuke Eguchi, Mehdi Benallegue, and K. Suzuki, "Torso Control Interface with Compliant Coupling for Assistive Mobility Devices", Humanoids 2022 Workshop on "the Advances in Close Proximity Human-Robot Collaboration", 2022. **(Oral, [link](#))**
- Y. Chen, L. Sun, M. Benallegue, R. Cisneros-Limón, Rohan P. Singh, K. Kaneko, A. Tanguy, G. Caron, K. Suzuki, A. Kheddar, and F. Kanehiro, "Enhanced Visual Feedback with Decoupled Viewpoint Control in Immersive Humanoid Robot Teleoperation using SLAM," IEEE-RAS International Conference on Humanoid Robots (Humanoids), 2022. **(Poster, peer-reviewed)**
- Chen, Y., Paez-Granados, D., Leme, B., and Suzuki, K., "Virtual Landmark Based Control of Docking Support for Assistive Mobility Devices", IEEE/ASME International Conference on Advanced Intelligent Mechatronics, 2021. **(Oral, peer-reviewed)**
- Y. Chen, D. Paez-Granados, H. Kadone, and K. Suzuki, "Control interface for hands-free navigation of standing mobility vehicles based on upper-body natural movements," in 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2020. **(Oral, peer-reviewed)**
- Y. Chen, D. Paez-Granados, and K. Suzuki, "Torso Control System with A Sensory Safety Bar for a Standing Mobility Device," in International Symposium on Micro-Nano Mechatronics and Human Science (MHS-2019), MEXT, Ed. Nagoya, Japan: IEEE, 2019. **(Oral, peer-reviewed)**

#### Presentation at domestic conference

- Y. Chen, D. Paez-Granados, and K. Suzuki, "Holistic body machine interface solution for standing mobility vehicle for the lower-body impaired-integrating autonomous docking system-," in The Proceedings of JSME Annual Conference on Robotics and Mechatronics (Robomec). **(Poster, non-peer-reviewed)**
- Chen Yang, Diego Paez-Granados, Kenji Suzuki, "Upper-Body Sensing Based Control System with Docking Support on A Standing Mobility Device", 生体医工学シンポジウム, 予稿・抄録集, 2019, 1A-23. **(Poster, non-peer-reviewed)**

#### Honors & Awards

- Mathematical Modeling Contest Third Prize Dec. 2015
- 1<sup>st</sup> prize in First Robot Competition of Jilin University Mar. 2017-May 2017
- Finalist (5/80, \$500,000 grant received) in [Toyota Mobility Unlimited Challenge](#) Apr. 2018-Dec. 2020  
The \$4 million Mobility Unlimited Challenge supports radical improvements in the mobility and independence of people with lower-limb paralysis through smarter assistive technology. We ([Team Qolo](#)) developed a mobile exoskeleton on wheels, allowing users to sit or stand with ease.
- JST SPRING Fellowship Qualified Student (Class 1) Oct. 2021-Mar 2022
- Finalist of the ANA Avatar XPRIZE international competition: [Team Janus](#) Mar. 2018-Present

#### Skills

- Programming language: Python, MATLAB, C++
- Software tools: Linux, ROS, Unity
- 3D/2D Modelling: CATIA, Solid works, AutoCAD, Fusion 360
- Electronics: EAGLE
- Language: Chinese (native), English (full professional proficiency), Japanese (N2)

#### Research Grants

- 2019
  - Challenge Grant 300,000 Japanese yen
- 2020
  - Challenge Grant 300,000 Japanese yen
- 2021
  - Challenge Grant 300,000 Japanese yen

- JST SPRING Research Grant 250,000 Japanese yen
- 2022-2024
  - Grant-in-Aid for JSPS Fellows 2300,000 Japanese yen

### **Scholarship**

- 2015~2017
  - University Scholarship (3<sup>rd</sup>-class), Jilin University
- 2018~2021
  - Special Fellows Scholarship, University of Tsukuba
- 2021~2022
  - JST SPRING Fellowship (1<sup>st</sup>-class), JST
- 2022~2024
  - JSPS Fellowship (DC2), JSPS

### **Academic Service (review)**

- RAL 2022 [2]
- IROS 2022 [1]
- T-MECH 2022 [1]
- HRI 2023 [1]