Kento Kawaharazuka

The University of Tokyo
Department of Mechano-Informatics
Engineering Building No. 2
7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan

Phone: +81-3-5841-7416
Fax: +81-3-5841-6285
Email: kawaharazuka@jsk.imi.i.u-tokyo.ac.jp
Homepage: https://haraduka.github.io

Personal

Date of Birth: 18/07/1994

Research Interests: Humanoid, Biomimetics, Machine Learning

Education

Ph.D. Candidate in Dept. of Mechano-Informatics, The University of University, Japan, with Prof. Masayuki Inaba (JSK Robotics Laboratory), 2019-current

M.S. in Dept. of Mechano-Informatics, Graduate School of Information Science and Technology, The University of Tokyo, Japan, 2017-2019

B.S. in Dept. of Mechano-Informatics, Faculty of Engineering, The University of Tokyo, Japan, 2013-2017

Experience

Internship at Preferred Networks, Robotics Engineer, Japan, 2018-current

Internship at Works Applications Co. Ltd., Software Engineer, Japan, 2016

Internship at Future Standard, Software Engineer, Japan, 2016

Internship at HIOKI, E.E. CORPORATION, Software Engineer, Japan, 2015

Skills

Software Skills

Basic: Java, JavaScript, Android, Haskell

Intermediate: Ruby, Lisp, Statistics

Advanced: C, C++, Python, Machine Learning, Algorithms

Hardware Skills

Basic: Electorinics, Machining

Intermediate: 3D CAD, 3D Printer

Publications

Journal Articles (Peer Reviewed)

1. **K. Kawaharazuka**, K. Tsuzuki, S. Makino, M. Onitsuka, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Long-time Self-body Image Acquisition and its Application to the Control of Musculoskeletal Structures", *IEEE Robotics and Automation Letters (**RAL**)*, vol. 4, no. 3, pp. 2965-2972, 2019, (**presented at IROS2019**)

2. **K. Kawaharazuka**, S. Makino, M. Kawamura, Y. Asano, K. Okada, M. Inaba: "Online Learning of Joint-Muscle Mapping using Vision in Tendon-driven Musculoskeletal Humanoids", *IEEE Robotics and Automation Letters (**RAL**)*, vol. 3, no. 2, pp. 772-779, 2018, (**presented at ICRA2018**)

3. **K. Kawaharazuka**, M. Kawamura, S. Makino, Y. Asano, K. Okada, M. Inaba: "Antagonist Inhibition Control in Redundant Tendon-driven Structures Based on Human Reciprocal Innervation for Wide Range Limb Motion of Musculoskeletal Humanoids", *IEEE Robotics and Automation Letters (**RAL**)*, vol. 2, no. 4, pp. 2119-2126, 2017, (**presented at IROS2017**)

International Conference Proceedings (Peer Reviewed)

1. **K. Kawaharazuka**, K. Tsuzuki, M. Onitsuka, Y. Koga, Y. Omura, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Reflex-based Motion Strategy of Musculoskeletal Humanoids under Environmental Contact Using Muscle Relaxation Control (in press)", *Proceedings of the 2019 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2019**)*, 2019

2. Y. Koga, **K. Kawaharazuka**, M. Onitsuka, T. Makabe, K. Tsuzuki, Y. Omura, Y. Asano, K. Okada, M. Inaba: "Modification of Muscle Antagonistic Relations and Hand Trajectory on the Dynamic Motion of Musculoskeletal Humanoid (in press)", *Proceedings of the 2019 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2019**)*, 2019

3. Y. Asano, S. Nakashima, I. Yanokura, M. Onitsuka, **K. Kawaharazuka**, K. Tsuzuki, Y. Koga, Y. Omura, K. Okada, M. Inaba: "Ankle-Hip-Stepping Stabilizer on Tendon-Driven Humanoid Kengoro by Integration of Muscle-Joint-Work Space Controllers for Knee-Stretched Humanoid Balance (in press)", *Proceedings of the 2019 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2019**)*, 2019

4. **K. Kawaharazuka**, S. Makino, K. Tsuzuki, M. Onitsuka, Y. Nagamatsu, K. Shinjo, T. Makabe, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Component Modularized Design of Musculoskeletal Humanoid Platform Musashi to Investigate Learning Control Systems (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019

5. **K. Kawaharazuka**, K. Tsuzuki, S. Makino, M. Onitsuka, K. Shinjo, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Task-specific Self-body Controller Acquisition by Musculoskeletal Humanoids: Application to Pedal Control in Autonomous Driving (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019

6. **K. Kawaharazuka**, T. Ogawa, C. Nabeshima: "Dynamic Task Control Method of a Flexible Manipulator Using a Deep Recurrent Neural Network (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019

7. K. Shinjo, **K. Kawaharazuka**, Y. Asano, S. Nakashima, S. Makino, M. Onitsuka, K. Tsuzuki, K. Okada, K. Kawasaki, M. Inaba: "Foot with a Core-shell Structural Six-axis Force Sensor for Pedal Depressing and Recovering from Foot Slipping during Pedal Pushing Toward Autonomous Driving by Humanoids (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019

8. S. Nakashima, T. Shirai, **K. Kawaharazuka**, Y. Asano Y. Kakiuchi, K. Okada, M. Inaba: "An Approach of Facilitated Investigation of Active Self-healing Tension Transmission System Oriented for Legged Robots (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019
9. T. Makabe, T. Shirai, Y. Nagamatsu, **K. Kawaharazuka**, S. Fumihito, K. Okada, M. Inaba: "Development of Joint Module with Two-Speed Gear Transmission and Joint Lock Mechanism during Driving for Task Adaptable Robot (in press)", *Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2019**)*, 2019
10. **K. Kawaharazuka**, K. Tsuzuki, S. Makino, Y. Asano, K. Okada, M. Inaba: "Modeling and Online Learning of Musculoskeletal Intersensory Networks for Static Controls of Tendon-driven Humanoids", *Proceedings of 9th International Symposium on Adaptive Motion of Animals and Machines (**AMAM2019**)*, 2019, **Company of Biologists Early Career Researcher Grant (500 GBP)**
11. **K. Kawaharazuka**, T. Ogawa, J. Tamura, C. Nabeshima: "Dynamic Manipulation of Flexible Objects with Torque Sequence Using a Deep Neural Network", *Proceedings of the 2019 IEEE International Conference on Robotics and Automation (**ICRA2019**)*, pp. 2139-2145, 2019
12. **K. Kawaharazuka**, T. Makabe, S. Makino, K. Tsuzuki, Y. Nagamatsu, Y. Asano, T. Shirai, F. Sugai, K. Okada, K. Kawasaki, M. Inaba: "TWIMP: Two-Wheel Inverted Musculoskeletal Pendulum as a Learning Control Platform in the Real World with Environmental Physical Contact", *Proceedings of the 2018 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2018**)*, pp. 784-790, 2018, (**The first two authors contributed equally to this work**)
13. **K. Kawaharazuka**, S. Makino, M. Kawamura, Y. Asano, K. Okada, M. Inaba: "A Method of Joint Angle Estimation Using Only Relative Changes in Muscle Lengths for Tendon-driven Humanoids with Complex Musculoskeletal Structures", *Proceedings of the 2018 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2018**)*, pp. 1128-1135, 2018
14. T. Makabe, **K. Kawaharazuka**, K. Tsuzuki, K. Wada, S. Makino, M. Kawamura, A. Fujii, M. Onitsuka, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Development of Movable Binocular High-Resolution Eye-Camera Unit for Humanoid and the Evaluation of Looking Around Fixation Control and Object Recognition", *Proceedings of the 2018 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2018**)*, pp. 840-845, 2018
15. **K. Kawaharazuka**, S. Makino, M. Kawamura, A. Fujii, Y. Asano, K. Okada, M. Inaba: "Online Self-body Image Acquisition Considering Changes in Muscle Routes Caused by Softness of Body Tissue for Tendon-driven Musculoskeletal Humanoids", *Proceedings of the 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2018**)*, pp. 1711-1717, 2018
16. S. Makino, **K. Kawaharazuka**, M. Kawamura, A. Fujii, T. Makabe, M. Onitsuka, Y. Asano, K. Okada, K. Kawasaki, M. Inaba: "Five-Fingered Hand with Wide Range of Thumb Using Combination of Machined Springs and Variable Stiffness Joints", *Proceedings of the 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2018**)*, pp. 4562-4567, 2018, **IEEE RAS Japan Joint Chapter Young Award (2018)**, **IROS ICROS Best Application Paper Award 2018 Finalists**
17. A. Fujii, S. Nakashima, M. Kawamura, **K. Kawaharazuka**, S. Makino, Y. Asano, K. Okada, M. Inaba: "Development and Functional Evaluation of a Deformable Membrane Capsule for an Open Ball Glenohumeral Joint", *Proceedings of The 2018 IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (**BIOROB2018**)*, pp. 853-858, 2018
18. **K. Kawaharazuka**, S. Makino, M. Kawamura, Y. Asano, Y. Kakiuchi, K. Okada, M. Inaba: "Human Mimetic Forearm Design with Radioulnar Joint using Miniature Bone-muscle Modules and its Applications", *Proceedings of the 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2017**)*, pp. 4956-4962, 2017, **IEEE RAS Japan Joint Chapter Young Award (2017)**

19. S. Makino, **K. Kawaharazuka**, M. Kawamura, Y. Asano, K. Okada, M. Inaba: "High-power flexible robust hand: Development of musculoskeletal hand using machined springs and realization of self-weight supporting motion with humanoid", *Proceedings of the 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS2017**)*, pp. 1187-1192, 2017

20. Y. Asano, T. Kozuki, S. Ookubo, M. Kawamura, S. Nakashima, T. Katayama, Y. Iori, H. Toshinori, **K. Kawaharazuka**, S. Makino, Y. Kakiuchi, K. Okada, M. Inaba: "Human Mimetic Musculoskeletal Humanoid Kengoro toward Real World Physically Interactive Actions", *Proceedings of the 2016 IEEE-RAS International Conference on Humanoid Robots (**HUMANOIDS2016**)*, pp. 876-883, 2016, **Best Interactive Paper Award Finalist**

Last updated: September 20, 2019

https://haraduka.github.io