# Prof. RYO KURAZUME, PhD

Faculty of Information Science and Electrical Engineering, Kyushu University
744 Motooka Nishi-ku Fukuoka Japan
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http://robotics.ait.kyushu-u.ac.jp/~kurazume/index-e.html

## EDUCATION

| | |
|---|---|
| Tokyo Institute of Technology, Japan<br>Ph.D. Department of Mechanical Engineering Science<br>"Study on Cooperative Positioning System" | 12/31/1998 |
| Tokyo Institute of Technology, Japan<br>M.Eng. Department of Mechanical Engineering Science<br>"Motion Control of Free Flying Robot with Dual-Arms" | 4/1/1989-3/31/1991 |

## WORK HISTORY

| | |
|---|---|
| Vice Dean, Faculty of Information Science and Electrical Engineering, Kyushu University | 4/1/2016-3/31/2018 |
| Professor, Faculty of Information Science and Electrical Engineering, Kyushu University | 4/1/2007-PRESENT |
| Associate Professor, Faculty of Information Science and Electrical Engineering, Kyushu University | 4/1/2002-3/31/2007 |
| Research Scientist, Institute of Industrial Science, University of Tokyo | 10/1/2000-3/31/2002 |
| Research Associate, Department of Mechanical Engineering Science Tokyo Institute of Technology | 1/1/1995-9/30/2000 |
| Researcher<br>Fujitsu Laboratories LTD | 4/1/1991-12/31/1994 |

## SOCIETIES and ACTIVITIES

| | |
|---|---|
| The Robotics Society of Japan | 1989-PRESENT |
| The Japan Society of Mechanical Engineers | 1995-PRESENT |
| The Information Processing Society of Japan | 2001-PRESENT |
| The Society of Instrument and Control Engineers | 2004-PRESENT |
| The Institute of Electronics, Information and Communication Engineers | 2006-PRESENT |

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| IEEE-RAS | 2006-PRESENT |

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| Vice Chairman of the Robotics and Mechatronics Division, The Japan Society of Mechanical Engineers (JSME) | 4/1/2018 |
| Director of the Robotics Society of Japan (RSJ) | 4/1/2013-3/31/2015 |
| Director of the Society of Instrument and Control Engineers (SICE) | 4/1/2013-3/31/2015 |
| Director of the Robotics Society of Japan (RSJ) | 4/1/2009-3/31/2011 |

Editorial and Administrative activities

Associate Editor IROS 07, ICRA 08, ICRA 09, ICRA 10, ICRA 11, AIM 12, IROS 13

Editor SII 12, IROS 17, Advanced Robotics

Reviewer ICRA 07, IROS 07, IROS 08, ICRA 09, IROS 09, ICRA 10, IROS 10, IROS 11, ICRA 12, AIM 12, IROS 12, SII 2012, ICRA 13, ICRA 14, AIM 2014, IROS 14, ICRA 15, IROS15, SII 2015, ICRA 16, IROS 16, ICRA 17, T-RO, RA-L, Advanced Robotics

## AWARDS and HONORS

| | |
|---|---|
| IEEE Senior Member | 12/28/2018 |
| Fellow of JSME | 2/18/2018 |
| SICE System Integration Division Academic Achievement Award | 12/21/2017 |
| Finalist of Best Service Robotics Paper Award, ICRA 2017 | 6/1/2017 |
| Fellow of RSJ | 9/8/2016 |
| SICE System Integration Division Research Award | 12/15/2015 |
| EST 2014 Best Paper in the Machine Vision Workshop | 9/11/2014 |
| RSJ Best Paper Award | 10/2/2014 |
| 14th Symposium on Construction Robotics in Japan Best Paper Award | 8/28/2014 |
| JSME Robotics and Mechatronics Academic Achievement Award | 5/28/2012 |
| Best Paper Award Candidate in Robotics Symposia | 3/15/2010 |
| IEEE ROBIO T.J.Tarn Best Paper in Robotics | 12/19/2010 |
| EST 2010 Best Paper Award | 9/6/2010 |
| JSME Robotics and Mechatronics Award | 5/25/2009 |
| RSJ Service Award | 9/10/2008 |
| RSJ Best Paper Award | 11/13/1993 |
| JSME Hatakeyama Award | 1989 |

## GRANT

NEDO SIP (Cross-ministerial Strategic Innovation Promotion Program) 2018-2022
New Energy and Industrial Technology Development Organization
Core Cooperative Researcher

JST CREST (Core Research for Evolutionary Science and Technology) 2017-2021
Japan Society for the Promotion of Science
Core Cooperative Researcher

JST CREST (Core Research for Evolutionary Science and Technology) 2017-2019
Japan Society for the Promotion of Science
Cooperative Researcher

Grant-in-Aid for Scientific Research (C) 2016-2018
Japan Society for the Promotion of Science
Cooperative Researcher

Grant-in-Aid for Challenging Exploratory Research 2016-2017
Japan Society for the Promotion of Science
Principal Investigator

Grant-in-Aid for Scientific Research (A) 2014-2017
Japan Society for the Promotion of Science
Principal Investigator

Grant-in-Aid for Challenging Exploratory Research 2014-2015
Japan Society for the Promotion of Science
Cooperative Researcher

Grant-in-Aid for Challenging Exploratory Research 2014-2015
Japan Society for the Promotion of Science
Principal Investigator

COI-STREAM (Center of Innovation Science and Technology 2013-2021
based Radical Innovation and Entrepreneurship Program)
Ministry of Education, Culture, Sports, Science and Technology
Researcher

Grant-in-Aid for Challenging Exploratory Research 2012-2013
Japan Society for the Promotion of Science
Principal Investigator

Strategic Information and Communications R&D Promotion Programme 2012-2015
Ministry of Internal Affairs and Communications
Researcher

Grant-in-Aid for Scientific Research (B) 2011-2013
Japan Society for the Promotion of Science
Principal Investigator

Grant-in-Aid for Scientific Research (B) 2010-2012
Japan Society for the Promotion of Science
Principal Investigator

A-Step (Adaptable and Seamless Technology Transfer Program 2010-2010
through Target-driven R&D

Japan Science and Technology Agency
Principal Investigator

Grant-in-Aid for Scientific Research Investigation 2009-2010
Japan Society for the Promotion of Science
Principal Investigator

Grant-in-Aid for Research on Construction Technology 2009-2010
Ministry of Land, Infrastructure, Transport and Tourism
Principal Investigator

Project to Develop "Innovative Seeds" 2008-2008
Japan Science and Technology Agency
Principal Investigator

Project for Future Generation Robots 2007-2012
New Energy and Industrial Technology Development Organization
Researcher

Project for Intelligent Medical Robots 2007-2010
New Energy and Industrial Technology Development Organization
Researcher

Grant-in-Aid for Scientific Research (B) 2007-2009
Japan Society for the Promotion of Science
Principal Investigator

Strategic Development of Advanced Robotics Elemental Technologies 2006-2008
New Energy and Industrial Technology Development Organization
Researcher

Grant-in-Aid for Scientific Research (B) 2006-2008
Japan Society for the Promotion of Science
Researcher

Grant-in-Aid for Research and Development 2006-2006
Fukuoka Industry, Science and Technology Foundation
Principal Investigator

Grant-in-Aid for Scientific Research (A) 2005-2008
Japan Society for the Promotion of Science
Researcher

Special Coordination Funds for Promoting Science and Technology, 2005-2007
Ministry of Education, Culture, Sports, Science and Technology
Researcher

Grant-in-Aid for Young Scientists (B), 2004-2005

Japan Society for the Promotion of Science
Principal Investigator

Strategic Information and Communications R&D Promotion Programme,2003-2005
Ministry of Internal Affairs and Communications
Researcher

Grant-in-Aid for Scientific Research (A), 2002-2004
Japan Society for the Promotion of Science
Researcher

Grant-in-Aid for Young Scientists , 1998-1999
Japan Society for the Promotion of Science
Principal Investigator

Grant-in-Aid for Young Scientists, 1996-1996
Japan Society for the Promotion of Science
Principal Investigator

# PUBLICATIONS

## International Journals (34 papers)

Development of ROS-TMS 5.0 for Informationally Structured Environment

Junya Sakamoto, Kouhei Kiyoyama, Kohei Matsumoto, Yoonseok Pyo, Akihiro Kawamura, Ryo Kurazume

ROBOMECH Journal, Vol.5, No.24, 2018, DOI: 10.1186/s40648-018-0123-9

Ancient Pelvis Reconstruction From Collapsed Component Bones Using Statistical Shape Models

Ken'ichi Morooka, Ryota Matsubara, Shoko Miyauchi, Takaichi Fukuda, Takeshi Sugii, Ryo Kurazume

Machine Vision and Applications, 2018, DOI: 10.1007/s00138-018-0972-5

Learning Geometric and Photometric Features from Panoramic LiDAR scans for Outdoor Place Categorization

Kazuto Nakashima, Hojung Jung, Yuki Oto, Yumi Iwashita, Ryo Kurazume, Oscar Martinez Mozos

Advanced Robotics, Volume 32, Issue 14, pp.750-765, 2018, doi:10.1080/01691864.2018.1501279

Fast modifed Self-organizing Deformable Model: Geometrical feature-preserving mapping of organ models onto target surfaces with various shapes and topologies

Shoko Miyauchi, Ken'ichi Morooka, Tokuo Tsuji, Yasushi Miyagi, Takaichi Fukuda, Ryo Kurazume

Computer Methods and Programs in Biomedicine, Vol.157, pp.237--250, 2018

Automatic large-scale three dimensional modeling using cooperative multiple robots
Ryo Kurazume, Souichiro Oshima, Shingo Nagakura, Yongjin Jeong, Yumi Iwashita
Computer Vision and Image Understanding, Vol. 157, pp. 25--42, April 2017

Local N-ary Patterns: a local multi-modal descriptor for place categorization
Hojung Jung, Oscar Martinez Mozos, Yumi Iwashita, Ryo Kurazume
Advanced Robotics, Vol. 30, No. 6, pp. 402--415, 2016, doi:10.1080/01691864.2015.1120242

Service Robot System with an Informationally Structured Environment
Yoonseok Pyo, Kouhei Nakashima, Shunya Kuwahata, Ryo Kurazume, Tokuo Tsuji, Ken'ichi Morooka, Tsutomu Hasegawa
Robotics and Autonomous Systems, Vol.74, No.Part A, pp. 148--165, 2015, doi:10.1016/j.robot.2015.07.010

The Informationally Structured Room for Robotic Assistancey
Tokuo Tsuji, Oscar Martinez Mozos, Hyunuk Chae, YoonSeok Pyo, Kazuya Kusaka, Tsutomu Hasegawa, Ken'ichi Morooka, Ryo Kurazume
Sensors, Vol.15, No.4, pp.9438--9465, 2015, doi:10.3390/s150409438

Manual/Automatic Colorization for Three-Dimensional Geometric Models utilizing Laser Reflectivity
Shuji Oishi, Ryo Kurazume
Advanced Robotics, Vol.28, No.24, pp.1617--1635, 2014, doi:10.1080/01691864.2014.968616

Identification of people walking along curved trajectories
Yumi Iwashita, Koichi Ogawara, Ryo Kurazume
Pattern Recognition Letters, Vol.48, No.15, pp.60--69, 2014, doi:10.1016/j.patrec.2014.04.004

Floor Sensing System using Laser Reflectivity for Localizing Everyday Objects and Robot
Yoonseok Pyo, Tsutomu Hasegawa, Tokuo Tsuji, Ryo Kurazume, Ken'ichi Morooka
Sensors, Vol.14, No.4, pp. 7524--7540, 2014, doi:10.3390/s140407524

Gait-based person identification robust to changes in appearance
Yumi Iwashita, Koji Uchino, Ryo Kurazume
Sensors, Vol.13, No.6, pp.7884--7901, 2013, doi:10.3390/s130607884

Categorization of Indoor Places by Combining Local Binary Pattern Histograms of Range and Reflectance Data from Laser Range Finders
Oscar Martinez Mozos, Hitoshi Mizutani, Hojung Jung, Ryo Kurazume, Tsutomu Hasegawa
Advanced Robotics, Vol.27, No.18, pp.1455--1464, 2013

Range Image Smoothing and Completion utilizing Laser Intensity
Shuji Oishi, Ryo Kurazume, Yumi Iwashita, Tsutomu Hasegawa
Advanced Robotics, Vol.27, No.12, pp.947--958, 2013

Robust Visual Servoing for Object Manipulation against Temporary Loss of Sensory Information using a Multi-Fingered Hand-Arm
Akihiro Kawamura, Kenji Tahara, Ryo Kurazume, Tsutomu Hasegawa

Journal of Robotics and Mechatronics, Vol.25, No.1, pp.125--135, 2013

Robust global localization using laser reflectivity
Dong Xiang ZHANG, Ryo Kurazume, Yumi Iwashita, Tsutomu Hasegawa
Journal of Robotics and Mechatronics, Vol.25, No.1, pp.38--52, 2013

Dynamic Grasping of an Arbitrary Polyhedral Object
Akihiro Kawamura, Kenji Tahara, Ryo Kurazume, Tsutomu Hasegawa
Robotica, Vol.31, No.4, pp. 511--523, 2013

Development of 3D scanning system using automatic guiding total station
Ken Endou, Takafumi Ikenoya, Ryo Kurazume
Journal of Robotics and Mechatronics, Vol.24, No.6, pp.992--999, 2012

Gait identification using shadow biometrics
Yumi Iwashita, Adrian Stoica, Ryo Kurazume
Pattern Recognition Letters, Vol.33, No.16, pp.2148--2155, 2012

Categorization of Indoor Places Using the Kinect Sensor
Oscar Martinez Mozos, Hitoshi Mizutani, Ryo Kurazume, Tsutomu Hasegawa
Sensors, Vol.12, No.5, pp.6695--6711, 2012

Laser-based geometrical modeling of large-scale architectural structures using co-operative multiple robots
Yukihiro Tobata, Ryo Kurazume, Yusuke Noda, Kai Lingemann, YumiIwashita, Tsutomu Hasegawa
Autonomous Robot, Vol.32, No.1, pp. 49--62, 2012

HELIOS Tracked Robot Team: Mobile RT System for Special Urban Search and Rescue Operations
Ryuichi Hodoshima, Michele Guarnieri, Ryo Kurazume, Hiroshi Masuda, Takao Inoh, Paulo Debenest, Edwardo F. Fukushima, Shigeo Hirose
Journal of Robotics and Mechatronics, Vol.23, No.6, pp.1041--1054, 2011

Multi-Part People Detection Using 2D Range Data
Oscar Martinez Mozos, Ryo Kurazume, Tsutomu Hasegawa
International Journal of Social Robotics, Vol.2, No.1, pp.31--40, 2010

A Decision Method for Placement of Tactile Elements on a Sensor Glove for the Recognition of Grasp Types
Kouji Murakami, Kazuya Matsuo, Tsutomu Hasegawa, and Ryo Kurazume
IEEE/ASME Transactions on Mechatronics, Vol.15, No.1, pp.157--162, 2010

Supporting Robotic Activities in Informationally Structured Environment with Distributed Sensors and RFID Tags
Kouji Murakami, Tsutomu Hasegawa, Ryo Kurazume, and Yoshihiko Kimuro
Journal of Robotics and Mechatronics, Vol.21, No.4, pp.453--459, 2009

3D reconstruction of a femoral shape using a parametric model and two 2D fluoroscopic images
Ryo Kurazume, Kaori Nakamura, Toshiyuki Okada, Yoshinobu Sato, Nobuhiko Sugano, Tsuyoshi

Koyama, Yumi Iwashita, Tsutomu Hasegawa
Computer Vision and Image Understanding, Vol.113, No.2, pp. 202--211, 2009

Hierarchical face cluster partitioning of polygonal surfaces and high-speed rendering
Tokuo Tsuji, Hongbin Zha, Tsutomu Hasegawa, Ryo Kurazume
Systems and Computers in Japan, Vol.38, No.8, pp.32--43, 2007

Fast Model-Image Registration using 2D Distance Map for Surgical Navigation System
Yumi Iwashita, Ryo Kurazume, Kozo Konishi, Masahiko Nakamoto, Naoki Aburaya, Yoshinobu Sato, Makoto Hashizume, Tsutomu Hasegawa
Advanced Robotics, Vol.21, No.7, pp751--770, 2007

The Great Buddha Project: Digitally Archiving, Restoring, and Analyzing Cultural Heritage Objects
Katsushi Ikeuchi, Takeshi Oishi, Jun Takamatsu, Ryusuke Sagawa, Atsushi Nakazawa, Ryo Kurazume, No Nishino, Mawo Kamakura
International Journal of Computer Vision, Vol.75, No.1, pp.189--208, 2007

A New Index of Serial Link Manipulator Performance Combining Dynamic Manipulability and Manipulating Force Ellipsoids
Ryo Kurazume, Tsutomu Hasegawa
IEEE Transactions on Robotics, Vol.22, No.5, pp.1022--1028, 2006

Mapping textures on 3D geometric model using reflectance image
Ryo Kurazume, Ko Nishino, Mark D. Wheeler, Katsushi Ikeuchi
Systems and Computers in Japan, Vol.36, No.13, pp.92--101, 2005

Feedforward and feedback dynamic trot gait control for quadruped walking vehicle
Ryo Kurazume, Kan Yoneda, and Shigeo Hirose
Autonomous Robots, Vol.12, No.2, pp.157--172, 2002

Development of a Cleaning Robot System with Cooperative Positioning System
Ryo Kurazume, Shigeo Hirose
Autonomous Robots, Vol.9, No.3, pp. 237--246, 2000

An Experimental Study of a Cooperative Positioning System
Ryo Kurazume, Shigeo Hirose
Autonomous Robots, Vol.8, No.1, pp. 43--52, 2000

## Domestic Journals in Japan (53 papers)

## Selected Refereed Conference Papers (15 papers out of 152 papers)

Previewed Reality: Near-future perception system
Yuta Horikawa, Asuka Egashira, Kazuto Nakashima, Akihiro Kawamura, Ryo Kurazume
2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017), pp.370-375, 2017

Feasibility study of IoRT platform "Big Sensor Box"

Ryo Kurazume, Yoonseok Pyo, Tokuo Tsuji, and Akihiro Kawamura
Proc. IEEE International Conference on Robotics and Automation (ICRA2017), pp. 3664-3671, 2017

Multi-modal Panoramic 3D Outdoor Datasets for Place Categorization
Hojung Jung, Yuki Oto, Oscar Mozos, Yumi Iwashita, Ryo Kurazume
Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016), pp.4545-4550, 2016

Automatic planning of laser measurements for a large-scale environment using CPS-SLAM system
Souichiro Oshima, Shingo Nagakura, Yongjin Jeong, Yumi Iwashita, Ryo Kurazume
Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2015), pp.4437-4444, 2015

Grasp Stability Evaluation based on Energy Tolerance in Potential Field
Tokuo Tsuji, Kosei Baba, Kenji Tahara, Kensuke Harada, Ken'ichi Morooka, Ryo Kurazume
Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2015), pp.2311-2316, 2015

Grasp Planning for Constricted Parts of Objects Approximated with Quadric Surfaces
Tokuo Tsuji, Soichiro Uto, Kensuke Harada, Ryo Kurazume, Tsutomu Hasegawa, Ken'ichi Morooka
2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2014), pp.2447-2453, 2014

First-Person Animal Activity Recognition from Egocentric Videos
Yumi Iwashita, Asamichi Takamine, Ryo Kurazume, Michael S. Ryoo
22nd International Conference on Pattern Recognition (ICPR 2014), pp.4310-4315, 2014

Colorization of 3D Geometric Model utilizing Laser Reflectivity
Shuji Oishi, Ryo Kurazume, Yumi Iwashita, Tsutomu Hasegawa
in Proc. IEEE International Conference on Robotics and Automation (ICPR 2013), pp.2311-2318, 2013

Iterative Learning Control for a Musculoskeletal Arm: Utilizing Multiple Space Variables to Improve the Robustness
Kenji Tahara, Yuta Kuboyama, Ryo Kurazume
Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2012), pp.4620-4625, 2012

Robust Visual Servoing for Object Manipulation with Large Time-Delays of Visual Information
Akihiro Kawamura, Kenji Tahara, Ryo Kurazume, Tsutomu Hasegawa
Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2012), pp.4797-4803, 2012

Position Tracking and Recognition of Everyday Objects by using Sensors Embedded in an Environment and Mounted on Mobile Robots
Kouji Murakami, Kazuya Matsuo, Tsutomu Hasegawa, Ryo Kurazume
in Proc. IEEE International Conference on Robotics and Automation (ICRA2012), pp., 2012

Denoising of Range Images using a Trilateral Filter and Belief Propagation
Shuji Oishi, Ryo Kurazume, Yumi Iwashita, Tsutomu Hasegawa
2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2011), pp.2020--2027, 2011

Robust Manipulation for Temporary Lack of Sensory Information by a Multi-Fingered Hand-Arm System
Akihiro Kawamura, Kenji Tahara, Ryo Kurazume, Tsutomu Hasegawa
2011 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2011), pp.4201--4206, 2011

Introduction to the Robot Town Project and 3-D Co-operative Geometrical Modeling Using Multiple Robots
Ryo Kurazume, Yumi Iwashita, Koji Murakami, Tsutomu Hasegawa
15th International Symposium on Robotics Research (ISRR 2011), pp., 2011

A Tactile Sensing for Estimating the Position and Orientation of a Joint-Axis of a Linked Object
Kazuya Matsuo, Kouji Murakami, Tsutomu Hasegawa, Ryo Kurazume
2010 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS10), pp.1884-1889, 2010

Domestic Conference Papers in Japan (447 papers)

Books/Chapters (7 books/chapters)

Invited Journal Papers (5 papers)

Invited Conference Papers/Talks (18)

## COOPERATIVE RESEARCHS

| | |
|---|---|
| 2018-Current | NTT DOCOMO, INC. |
| 2018-Current | Living robot Inc. |
| 2017 | hapi-robo st, Inc. |
| 2016-Current | JATCO Ltd. |
| 2015-Current | Panasonic Inc. |
| 2015 | KOBE STEEL LTD. |
| 2013-2015 | YASKAWA Electric Corporation |
| 2011-2013 | SEIBU Landscape Co. LTD. |
| 2011-2012 | Hitachi, Ltd. |
| 2010 | Systems Engineering Consultants Co., LTD. |
| 2010-2012 | Mitsubishi Electric Corporation |
| 2009-2010 | TOKYU CONSTRUCTION CO., LTD. |

# PATENTS

Japanese Unexamined Patent Application Publication No. 2016-218534
Japanese Unexamined Patent Application Publication No. 2013-190272
Japanese Unexamined Patent Application Publication No. Hei 08-255247
Japanese Unexamined Patent Application Publication No. Hei 08-145714
Japanese Unexamined Patent Application Publication No. Hei 08-063581
Japanese Unexamined Patent Application Publication No. Hei 08-030327
Japanese Unexamined Patent Application Publication No. Hei 07-152715
Japanese Unexamined Patent Application Publication No. Hei 07-080790
Japanese Unexamined Patent Application Publication No. Hei 06-314124
Japanese Unexamined Patent Application Publication No. Hei 06-203166
Japanese Unexamined Patent Application Publication No. Hei 06-187009
Japanese Unexamined Patent Application Publication No. Hei 06-035510
Japanese Unexamined Patent Application Publication No. Hei 05-197701