

## Prof. RYO KURAZUME, PhD

Faculty of Information Science and Electrical Engineering, Kyushu University  
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<http://robotics.ait.kyushu-u.ac.jp/~kurazume>

### EDUCATION

Tokyo Institute of Technology, Japan 1998  
Ph.D. Department of Mechanical Engineering Science  
"Study on Cooperative Positioning System"

Tokyo Institute of Technology, Japan 1989-1991  
M.S. Department of Mechanical Engineering Science  
"Motion Control of Free Flying Robot with Dual-Arms"

### WORK HISTORY

Vice Dean, Faculty of Information Science and Electrical Engineering, Kyushu University 2016- PRESENT

Professor, Faculty of Information Science and Electrical Engineering, Kyushu University 2007- PRESENT

Associate Professor, Faculty of Information Science and Electrical Engineering, Kyushu University 2002-2007

Research Scientist, Institute of Industrial Science, University of Tokyo 2000-2002

Research Associate, Department of Mechanical Engineering Science Tokyo Institute of Technology 1995-2000

Researcher Fujitsu Laboratories LTD 1991-1994

### 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

IEEE-RAS	2006-PRESENT
Director of the Robotics Society of Japan (RSJ)	2013-2015
Director of the Society of Instrument and Control Engineers (SICE)	2013-2015
Director of the Robotics Society of Japan (RSJ)	2009-2011

## AWARDS and HONORS

SICE System Integration Division Academic Achievement Award	2017
Fellow of RSJ	2016
SICE System Integration Division Research Award	2015
EST 2014 Best Paper in the Machine Vision Workshop	2014
RSJ Best Paper Award	2014
14th Symposium on Construction Robotics in Japan Best Paper Award	2014
JSME Robotics and Mechatronics Academic Achievement Award	2012
Best Paper Award Candidate in Robotics Symposia	2010
IEEE ROBIO T.J.Tarn Best Paper in Robotics	2010
ICEST Best Paper Award	2010
JSME Robotics and Mechatronics Award	2009
RSJ Service Award	2008
RSJ Best Paper Award	1993
JSME Hatakeyama Award	1989

## GRANT

JST CREST (Core Research for Evolutionary Science and Technology) Japan Society for the Promotion of Science Core Cooperative Researcher	2017-2022
JST CREST (Core Research for Evolutionary Science and Technology) Japan Society for the Promotion of Science Cooperative Researcher	2017-2019
Grant-in-Aid for Challenging Exploratory Research Japan Society for the Promotion of Science Principal Investigator	2016-2017
Grant-in-Aid for Scientific Research (A) Japan Society for the Promotion of Science Principal Investigator	2014-2017
Grant-in-Aid for Challenging Exploratory Research Japan Society for the Promotion of Science Principal Investigator	2014-2015
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 New Energy and Industrial Technology Development Organization Researcher	2006-2008
Grant-in-Aid for Scientific Research (B) Japan Society for the Promotion of Science Researcher	2006-2008
Grant-in-Aid for Research and Development Fukuoka Industry, Science and Technology Foundation Principal Investigator	2006-2006
Grant-in-Aid for Scientific Research (A) Japan Society for the Promotion of Science Researcher	2005-2008
Special Coordination Funds for Promoting Science and Technology, Ministry of Education, Culture, Sports, Science and Technology Researcher	2005-2007
Grant-in-Aid for Young Scientists (B), Japan Society for the Promotion of Science Principal Investigator	2004-2005
Strategic Information and Communications R&D Promotion Programme,2003-2005 Ministry of Internal Affairs and Communications Researcher	
Grant-in-Aid for Scientific Research (A), Japan Society for the Promotion of Science Researcher	2002-2004
Grant-in-Aid for Young Scientists , Japan Society for the Promotion of Science Principal Investigator	1998-1999
Grant-in-Aid for Young Scientists, Japan Society for the Promotion of Science Principal Investigator	1996-1996

## PUBLICATIONS

### International Journals (30 papers)

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., No., pp., 2016 (accepted)

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 Assistance  
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, Yumi Iwashita, 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 (52 papers)**

### **Selected Refereed Conference Papers (15 papers out of 143 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

Denosing 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 (429 papers)**

**Books/Chapters (7 books/chapters)**

**Invited Journal Papers (5 papers)**

**Invited Conference Papers/Talks (18)**

## **COOPERATIVE RESEARCHS**

2017-Current	hapi-robot, 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