

Field and Service Robotics 2012 Ver.3

Program Agenda (Tentative version)

[Monday, July 16, 2012 \(Tohoku University\)](#)

Lab Tour

09:30-11:30 Lab Tour (Tadokoro Lab, Yoshida Lab, Kosuge Lab, Uchiyama Lab)

Opening Talk

13:00-13:05 Welcome address

Prof. Kazuya Yoshida & Prof. Satoshi Tadokoro

Keynote Speeches

13:05-13:55 Damage Due to the 2011 Tohoku Earthquake Tsunami and its Reconstruction

Prof. Fumihiko Imamura

13:55-14:45 Spatio-Temporal Video Archive of 3.11 Earthquake and Tsunami Disasters and Their Visualization Supported by Computer Vision Techniques

Prof. Koichiro Deguchi

14:45-15:05 (Short break)

15:05-15:55 Human-Robot Interaction Lessons from Unmanned Vehicles at Fukushima and Tohoku Tsunami Response

Prof. Robin R. Murphy

15:55-16:45 Rescue Mobile Robot Quince: Toward Emergency Response to Nuclear Accident at Fukushima Daiichi Nuclear Power Plants on March 2011

Keiji Nagatani

[Tuesday, July 17, 2012 \(Hotel Taikanso, Matsushima\)](#)

Opening Talk

08:30-08:35 Welcome address

Prof. Kazuya Yoshida & Prof. Satoshi Tadokoro

08:35-08:45 Opening Talk

Dr. Alex Zelinsky

Keynote Speech

08:45-09:35 Therapeutic Robot, PARO, and Mental Care for Victims of Disaster by Earthquakes in Japan

Dr. Takanori Shibata

Session 1: Organized Session-- Disaster Response (1)

09:35-10:00 Utilization of Robot Systems in Disaster Sites of the Great Eastern Japan Earthquake
Fumitoshi Matsuno, Noritaka Sato, Kazuyuki Kon, Hiroki Igarashi, Tetsuya Kimura and Robin Murphy

10:00-10:25 Improvements to the rescue robot Quince -Toward future indoor surveillance missions in the Fukushima Daiichi Nuclear Power Plant-
Tomoaki Yoshida, Keiji Nagatani, Satoshi Tadokoro, Takeshi Nishimura and Eiji Koyanagi

10:25-10:40 Coffee break

Session 2: Organized Session-- Disaster Response (2)

10:40-11:05 Creating Multi-Viewpoint Panoramas of Streets with Sparsely Located Buildings
Takayuki Okatani, Ken Sakurada, Jun Yanagisawa, Daiki Tetsuka and Koichiro Deguchi

11:05-11:30 Disaster Back-up Support using GIS Contents Composed of Images from Satellite and UAV
Sota Shimizu, Taro Suzuki, Yoshiyuki Fukazawa and Takumi Hashizume

11:30-11:55 Collaborative Mapping of an Earthquake-Damaged Building via Ground and Aerial Robots
Nathan Michael, Shaojie Shen, Kartik Mohta, Vijay Kumar, Keiji Nagatani, Yoshito Okada, Seiga Kiribayashi, Kazuki Otake, Kazuya Yoshida, Kazunori Ohno, Eijiro Takeuchi and Satoshi Tadokoro

11:55-12:45 Lunch time

Keynote Speech

12:45-13:35 Autonomous Agile Aerial Robots
Prof. Vijay Kumar

13:35-13:45 Coffee break

Session 3: Organized Session-- Disaster Response (3)

13:45-14:10 Mine Detecting Robot System
SeungBeum Suh, Junho Choi, Changhyun Cho, YeonSub Jin, Seung-Yeup Hyun and Sungchul Kang

14:10-14:35 Experience in System Design for Human-Robot Teaming in Urban Search & Rescue
Geert-Jan Kruijff, Miroslav Janicek, Shanker Keshavdas, Benoit Larochelle, Hendrik Zender, Nanja Smets, Tina Mioch, Mark Neerinx, Jurriaan van Diggelen, Francis Colas, Ming Liu, Francois Pomerleau, Roland Siegwart, Vaclav Hlavac, Tomas Svoboda, Tomas Petricke, Michael Reinstein, Karel Zimmerman, Fiora Pirri and Mario Gianni

14:35-15:00 Advancing the State of Urban Search and Rescue Robotics through the RoboCupRescue Robot League Competition
Raymond Ka-Man Sheh, Adam Jacoff, Ann-Marie Virts, Tetsuya Kimura, Johannes Pellenz, Soren Schwertfeger and Jackrit Suthakorn

15:00-18:00 **Technical tour**

18:00-21:00 **Welcome reception**

[Wednesday, July 18, 2012 \(Hotel Taikanso, Matsushima\)](#)

Keynote Speech

08:30-09:20 Design and Navigation of Wheeled, Running and Flying Robots
Prof. Roland Siegwart

09:20-09:30 **Short break**

Session 4: Service / Entertainment Robotics

09:30-09:55 Estimating the 3D position of humans wearing a reflective vest using a single camera system
Rafael Mosberger, Henrik Andreasson and Achim Lilienthal

09:55-10:20 Android Robot for Communication Support in Hospitals and Elderly Facilities
Yoshio Matsumoto, Masahiro Yoshikawa, Masahiko Sumitani and Hiroshi Ishiguro

10:20-10:45 Multi-Robot Formation Control via a Real-Time Drawing Interface
Sandro Hauri, Javier Alonso-Mora, Andreas Breitenmoser, Roland Siegwart and Paul Beardsley

10:45-11:00 **Coffee break**

Session 5: Inspection / Maintenance Robotics

11:00-11:25 Automated and Cost-effective Calibration of a Robot Manipulator-mounted IR Range Camera for Steel Bridge Maintenance
Andrew Wing Keung To, Gavin Paul, David Rushton-Smith, Dikai Liu and Gamini dissanayake

11:25-11:50 Vertical Infrastructure Inspection using a Quadcopter and Shared Autonomy Control
Inkyu Sa and Peter Corke

11:50-12:15 Towards Autonomous Robotic Systems for Remote Gas Leak Detection and Localization in Industrial Environments
Samuel Soldan, Jochen Welle, Thomas Barz, Andreas Kroll and Dirk Schulz

Interactive Session

12:15-12:25 Short explanation for interactive session

12:25-13:15 Lunch time

13:15-14:30 Interactive session

Terrain Mapping and Control Optimization for a 6-Wheel Rover with Passive Suspension

Pascal Strupler, Cedric Pradalier and Roland Siegwart

Three-dimensional Thermography Mapping for Mobile Rescue Robots

Keiji Nagatani, Kazuki Otake and Kazuya Yoshida

Path Planning and Navigation Framework for Planetary Exploration Rover using Laser Range Finder

Genya Ishigami, Masatsugu Otsuki and Takashi Kubota

Solid Model Reconstruction of Large-Scale Outdoor Scenes from 3D Lidar Data

Ciril Baselgia, Michael Bosse, Robert Zlot and Claude Holenstein

Evaluation and training system of muscle strength for leg rehabilitation utilizing an MR fluid active loading machine

Hiroshi NAKANO and Masami NAKANO

Development of a Low Cost Multi-Robot Autonomous Marine Surface Platform

Abhinav Valada, Prasanna Velagapudi, Balajee Kannan, Christopher Tomaszewski, George Kantor and Paul Scerri

Session 6: Mobile Robot Navigation

14:30-14:55 To the Bookstore! Autonomous Wheelchair Navigation in an Urban Environment

Corey Montella, Timothy Perkins, John Spletzer and Michael Sands

14:55-15:20 A Trail-Following Robot Which Uses Appearance and Structural Cues

Christopher Rasmussen, Yan Lu and Mehmet Kocamaz

15:20-15:45 Construction of Semantic Maps for Personal Mobility Robots in Dynamic Outdoor Environments

Naotaka Hatao, Satoshi Kagami, Ryo Hanai, Kimitoshi Yamazaki and Masayuki Inaba

15:45-16:10 Robust Monocular Visual Odometry for a Ground Vehicle in Undulating Terrain

Ji Zhang, Sanjiv Singh and George Kantor

16:10-16:35 Lighting-Invariant Visual Odometry using Lidar Intensity Imagery and Pose Interpolation

Hang Dong and Timothy Barfoot

16:35-16:50 Coffee break

Session 7: Agricultural Robotics

16:50-17:15 Modelling and Calibrating Visual Yield Estimates in Vineyards

Stephen Nuske, Kamal Gupta, Srinivasa Narasimhan and Sanjiv Singh

17:15-17:40 Forest 3D Mapping and Tree Sizes Measurement for Forest Management based on Sensing Technology for Mobile Robots

Takashi Tsubouchi, Asuka Asano, Toshihiko Mochizuki, Shuhei Kondou, Keiko Shiozawa, Mitsuhiro Matsumoto, Shuhei Tomimura, Shuichi Nakanishi, Akiko Mochizuki, Yukihiro Chiba, Kouji Sasaki and Toru Hayami

18:00-21:00 Dinner cruise

[Thursday, July 19, 2012 \(Hotel Taikanso, Matsushima\)](#)

Keynote Speech

08:30-09:20 Thoughts on Fully Autonomous Vehicles

Prof. Alberto Broggi

09:20-09:30 Short break

Session 8: Robots for Excavation

09:30-09:55 Iterative Autonomous Excavation

Guilherme J. Maeda, David C. Rye and Surya P. N. Singh

09:55-10:20 Rock recognition using stereo vision for large rock breaking operation

Anusorn Iamrurksiri, Takashi Tsubouchi and Shigeru Sarata

10:20-10:35 Coffee break

Session 9: Planetary Exploration

10:35-11:00 Plowing for Rover Control on Extreme Slopes

David Kohanbash, Scott Moreland and David Wettergreen

11:00-11:25 Complementary Flyover and Rover Sensing for Superior Modeling of Planetary Terrain Features

Heather Jones, Uland Wong, Kevin Peterson, Jason Koenig, Aashish Sheshadri and William Whittaker

11:25-11:50 Image-Directed Sampling for Geometric Modeling of Lunar Terrain

Uland Wong, Ben Garney, Chuck Whittaker and Red Whittaker

11:50-12:15 Motion Analysis System for Robot Traction Device Evaluation and Design

Scott Moreland, Krzysztof Skonieczny and David Wettergreen

12:15-13:15 Lunch time

Session 10: Large Area Mapping

13:15-13:40 Efficient Large-Scale 3D Mobile Mapping and Surface Reconstruction of an Underground Mine

Robert Zlot and Michael Bosse

13:40-14:05 Large Scale Monocular Vision-only Mapping from a Fixed-Wing sUAS

Michael Warren, David McKinnon, Hu He, Arren Glover, Michael Shiel and Ben Upcroft

14:05-14:30 A Super-Voxel Based Segmentation and Classification Method for 3D Urban Landscapes with Evaluation and Comparison

Ahmad Kamal Aijazi, Paul Checchin and Laurent Trassoudaine

14:30-14:55 Classification of 3-D Point Cloud Data that Includes Line and Frame Objects on the Basis of Geometrical Features and the Pass Rate of Laser Rays

Kazunori Ohno, Takahiro Suzuki, Kazuyuki Higashi, Masanobu Tsubota, Eijiro Takeuchi and Satoshi Tadokoro

14:55-15:10 Coffee break

Session 11: SLAM for Outdoor Robots

15:10-15:35 Real-time Localization and Mapping in Underground Mines with Band-matching Method

James Lee, David Wettergreen and George Kantor

15:35-16:00 Featureless Visual Processing for SLAM in Changing Outdoor Environments

Michael Milford and Ashley George

16:00-16:25 Gold-fish SLAM: An application of SLAM to localize AGVs

Henrik Andreasson, Abdelbaki Bouguerra, Achim Lilienthal, Bjorn Astrand and Thorsteinn Rognvaldsson

16:25-16:45 Short break

Session 12: Elemental Technology for Mobile Robots

16:45-17:10 Design, Development, and Mobility test of an Omnidirectional Mobile Robot for Rough Terrain

Genya Ishigami, Elvine Pineda, Jim Overholt, Greg Hudas and Karl Iagnemma

17:10-17:35 A Vector Algebra Formulation of Mobile Robot Velocity Kinematics

Alonzo Kelly and Neal Seegmiller

17:35-18:00 A Self-Learning Ground Classifier using Radar Features

Giulio Reina, Annalisa Milella and James Underwood

18:30-20:30 Farewell dinner