

All sessions are in room O100 except for tutorials which are in rooms O95 and U78

DAY 1: MARCH 31

8:15-9:00 Registration

At the entrance hall, University of Southern Denmark

Tutorials: 9:00-12:30

T1) Ubiquitous Robotics

T2) Spatial Computing

9:00-10:00 Tutorials: Part I (T1 and T2)

10:30-11:00 Coffee break

11:00-12:30 Tutorials: Part II (T1 and T2)

Lunch 12:30-13:45

13:45-14:00 Opening Remarks

Session 1: 14:00-15:15

ORIENTATION ESTIMATION, LOCALIZATION AND MAPPING

Chair: Kasper Stoy (University of Southern Denmark)

14:00 - 14:25

Acoustic Head Orientation estimation applied to powered wheelchair control

Akira Sasou (National Institute of Advanced Industrial Science and Technology, AIST)

14:25 - 14:50

Performance Enhancement for Outdoor Cooperative Localization Considering of Error Correlation between GPS data

Sanghyun Joo (ADD),

Jihong Lee (CNU),

Jiyong Kim (CNU),

Joongki Park (ETRI)

14:50 - 15:15

Swarm Based Construction of Large Scale Maze-Like Environments Communication with IR Landmark

Raphael Maas (Institute of Computer Engineering),

Erik Maehle (Institute of Computer Engineering)

15:15-15:45 Coffee break

Session 2: 15:45-17:00

MODULAR AND NETWORKED SYSTEMS

Chair: Naomi Leonard (Princeton University)

15:45 - 16:10

Multi-Pendulum Synchronization Using Constrained Agreement Protocols

Rahul Chipalkatty (Georgia Institute of Technology),

Magnus Egerstedt (Georgia Institute of Technology),

Shun-Ichi Azuma (Kyoto University)

16:10 - 16:35

An Optocoupled Poseable Ball and Socket Joint for Computationally Enhanced Construction Kits

Michael Philetus Weller (Carnegie Mellon University),

Ellen Yi-Luen Do (Georgia Institute of Technology),

Mark D Gross (Carnegie Mellon University)

16:35 - 17:00

Utilizing Redundancy in Modular Robots to Achieve Greater Accuracy

Tom Larkworthy (Edinburgh University),

Gillian Hayes (Edinburgh University)

17:15-18:30 Welcome reception

At the Maersk Insitute, University of Southern Denmark

DAY 2: APRIL 1

Plenary 1: 9:00-10:00

Architectures, abstractions, and algorithms for large teams of robots

Prof. Vijay Kumar, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, USA

Chair: Magnus Egerstedt

Coffee break: 10:00-10:30

Session 3: 10:30-12:10

COMMUNICATION-CONSTRAINED MULTI ROBOT CONTROL

Chair: Hans Doran (Zurich University of Applied Sciences)

10:30 - 10:55

Effects of underwater communication constraints on the control of marine robot teams

Filippo Arrichiello (University of Cassino),
Daniel Liu (University of Southern California),
Srinivas Yerramalli (University of Southern California),
Arvind Pereira (University of Southern California),
Jnaneshwar Das (University of Southern California),
Urbashi Mitra (University of Southern California),
Gaurav Sukhatme (University of Southern California)

10:55 - 11:20

Adaptive Signal Strength Prediction based on Radio Propagation Models for improving Multi-Robot Navigation Strategies

Bernd Broggemann (FGAN),
Alexander Tiderko (FGAN),
Markus Stilkerieg (FGAN)

11:20 - 12:45

A UDP-based protocol for mobile robot control over wireless internet

Dongkwon Cho (KT),
Jeonggyun Ahn (KT),
Youngsik Kwon (KT),
Jonghoon Eom (KT),
Youngil Kim (KT)

11:45 - 12:10

A Network Architecture for Large Mobile Robotics Environments

Eleri Cardozo (FEEC-Unicamp),
Daniel Moraes (University of Campinas),
Paulo Coelho (University of Campinas),
Eliane Guimarães (Information Technology Center Renato Archer),
Thienne Johnson (University of Campinas),
Fernanda Atizani (University of Campinas)

Lunch 12:10-14:00

Session 4: 14:00-15:40

ROBOTIC COORDINATION FOR COMPLEX TASKS

Chair: Tomohisa Hayakawa (Tokyo Institute of Technology)

14:00 - 14:25

Scalable and Practical Pursuit-Evasion

Marcos Vieira (University of Southern California),
Gaurav Sukhatme (University of Southern California),
Ramesh Govindan (University of Southern California)

14:25 - 14:50

Graph-Based Distributed Control for Non-holonomic Vehicles Engaged in a Reconfiguration Task using Local Positioning Information

Sven Goyal (EPFL),
Riccardo Falconi (Universita di Bologna),
Jim Pugh (EPFL),
Alcherio Martinoli (EPFL)

14:50 - 15:15

Optimal Multi-UAV Convoy Protection

Xu Chu Ding (Georgia Institute of Technology),

Amir Rahmani (Georgia Institute of Technology),

Magnus Egerstedt (Georgia Institute of Technology)

15:15 - 15:40

Autonomous Fault Tolerant Multi-Robot Coordination for Object Transportation Based on Artificial Immune System

Muhammad Khan (University of British Columbia),

Clarence de Silva (University of British Columbia)

15:40-16:10 Coffee break

Session 5: 16:10-17:25

MAP BUILDING, SENSOR COVERAGE AND AGGREGATION

Chair: Filippo Arrichiello (University of Cassino)

16:10 - 16:35

Behavior Modes for Randomized Robotic Coverage

Jacob Beal (BBN Technologies),

Nikolaus Correll (MIT),

Leonardo Urbina (MIT),

Jonathan Bachrach (Makani Power)

16:35 - 17:00

Connectivity vs. Control: Using Directional and Positional Cues to Stabilize Routing in Robot Networks

Karthik Dantu (University of Southern California),

Gaurav Sukhatme (University of Southern California)

17:30 - 17:25

Robustness of Aggregation in Networked Dynamical Systems

Luca Scardovi (Princeton University),

Naomi Leonard (Princeton University)

19:00 Galla Dinner

At the First Hotel Grand, City Center

DAY 3: APRIL 2

Plenary 1: 9:00-10:00

Integrating human and robot decision-making dynamics

Prof. Naomi Leonard Department of Mechanical and Aerospace Engineering Princeton University, USA

Chair: Alcherio Martinoli

Coffee break: 10:00-10:30

Session 6: 10:30-12:10

SOFTWARE TOOLS AND ARCHITECTURE

Chair: Veyzel Gazi (TOBB University)

10:30 - 10:55

Investigating Feasible Tools for Swarm Pattern Transformation

Blesson Varghese (University of Reading),

Gerard McKee (University of Reading)

10:55 - 11:20

TosNet: An easy-to-use, real-time communications protocol for modular, distributed robot controllers

Simon Falsig (University of Southern Denmark),

Anders Sørensen (University of Southern Denmark)

11:20 - 12:45

Open Dynamic Distributed Service Architecture Design and Modelling

Philippe Bretier (Orange Labs),

Ghislain PUTOIS (Orange Labs),

Thierry Moudenc (Orange Labs)

11:45 - 12:10

Flexible Software for Industrial Robots

Antonio Ferrolho (Superior School of Technology of Viseu, Polytechnic Institute of Viseu),

Manuel Crisóstomo (Department of Electrical and Computer Engineering, University of Coimbra)

Lunch 12:10-14:00

Session 7: 14:00-15:15

FORMATION CONTROL AND MOTION PLANNING

Chair: Manuel Crisóstomo (University of Coimbra)

14:00 - 14:25

Formation Control of Omnidirectional Mobile Robots using Distributed Model Predictive Control

Kiattisin Kanjanawanishkul (University of Tuebingen)

14:25 - 14:50

Distributed Strategies for Local Minima Escape in Motion Planning for Mobile Networks

Zhenwang Yao (School of Engineering Science, Simon Fraser University),

Kamal Gupta (Simon Fraser University)

14:50 - 15:15

Communication-Aware Target Tracking using Navigation Functions -- Centralized Case

Yasamin Mostofi (University of New Mexico),

Alireza Ghaffarkhah (University of New Mexico)

15:15-15:45 Coffee break

Session 8: 15:45-17:00

WIRELESS COMMUNICATION AND ROBOTICS

Chair: Yasamin Mostofi (University of New Mexico)

15:45 – 16:10

A Communication Technique for Swarm-Capable Autonomous Agents

Hans Dermot Doran (Zurich University of Applied Sciences)

16:10 - 16:35

Experimental Study on the Effects of Communication Range on Cooperative Robotic Search in Complex Environments

Omer Cayirpunar (TOBB University of Economics and Technology),

Veyesel Gazi (TOBB University of Economics and Technology),

Bulent Tavli (TOBB University of Economics and Technology),

Enric Cervera (Jaume-I University),

Ulf Witkowski (University of Paderborn),

Jacques Penders (Sheffield Hallam University)

16:35 – 17:00

Minimizing Sum Distortion for Static and Mobile Fusion Center Placement in Underwater Sensor Networks

Filippo Arrichiello (University of Cassino),

Gaurav Sukhatme (University of Southern California),

Urbashi Mitra (University of Southern California),

Satish Vedantam (University of Southern California)

17:00-17:10 Closing Remarks

17:10-18:00 Farewell reception