

SSS2018 Technical Program

Sunday, November 4 (Workshop Day)

2nd Workshop on Self-organization in Swarm of Robots (WSSR)

Session 1: Toward Autonomous Self-Organizing Systems for Mobile Robots (Chair: Yoshiaki Katayama)

9:30 – 11:00 Introduction: JST SICORP project “Realization of Sustainable Autonomous Self-Organizing Systems by Low-Functional Robots in Environmental Disaster Recovery”

Mobile Robots Communicating, Computing and Acting

Shlomi Dolev

Computational Power of Myopic Robots on Graphs

Fukuhito Ooshita

Rendezvous on asynchronous mobile robots with lights -Relationship between power of lights and synchrony-

Koichi Wada

11:00 – 11:15 Break

Session 2: Optimization (Chair: Yukiko Yamauchi)

11:15 – 12:45 **Optimization in multi-agent patrolling on graphs**

Akitoshi Kawamura

Explorations with energy-constrained mobile robots

Shantanu Das

Patrolling Problem and Relatives

Leszek Gsieniec

12:45 – 14:15 Lunch

Session 3: Mobile robots (Chair: Paola Flocchini)

14:15 – 15:35 **TuringMobile: A Turing Machine of Oblivious Mobile Robots with Limited Visibility**

Giovanni Viglietta

Mitigating faults and attacks in mobile robotic systems

Sébastien Tixevil

Model Checking of Mobile Robot Algorithms

Doan Thi Thu Ha

15:35 – 16:00 Break

Session 4: Programmable Matter (Chair: Giovanni Viglietta)

16:00 – 17:30 **Self-Organizing Particle Systems: an Algorithmic Approach to Programmable Matter**

Joshua Daymude

Network Constructors and the Crystal Structure Prediction Problem

Michail Theofilatos

An Autonomous Distributed System Consisting of Pair-Robots: Model and Basic Algorithms

Yonghwan Kim

An Introduction to Leader Election in the Population Protocol Model

Yuichi Sudo

18:30 – 20:30 **Welcome reception at Alice Aqua Garden Tamachi**

Monday, November 5

9:10 – 9:15 Opening

Session 1: Keynote Talk 1 (Chair: Taisuke Izumi)

9:15 – 10:15 **Secure Outsourcing of Statistical Analysis and Machine Learning using Homomorphic Encryption**
Jun Sakuma

10:15 – 10:30 Break

Session 2: Security and Byzantine Fault Tolerance (Chair: Shlomi Dolev)

10:30 – 10:57 **Reliable Broadcast in Dynamic Networks with Locally Bounded Byzantine Failures**
Silvia Bonomi, Giovanni Farina and Sébastien Tixeuil

10:57 – 11:24 **Physical Zero-Knowledge Proof for Makaro**
Xavier Bultel, Jannik Dreier, Jean-Guillaume Dumas, Pascal Lafourcade, Daiki Miyahara, Takaaki Mizuki, Atsuki Nagao, Tatsuya Sasaki, Kazumasa Shinagawa and Hideaki Sone

11:24 – 11:36 **Brief Announcement: Continuous vs. Discrete Asynchronous Moves: a Certified Approach for Mobile Robots**
Thibaut Balabonski, Pierre Courtieu, Robin Pelle, Lionel Rieg, Sébastien Tixeuil and Xavier Urbain

11:36 – 13:00 Lunch

Session 3: Agreement and Storage (Chair: Swan Dubois)

13:00 – 13:27 **k-Set Agreement and Renaming in the Presence of Contention-Related Crash Failure**
Anais Durand, Michel Raynal and Gadi Taubenfeld

13:27 – 13:54 **Clairvoyant State Machine Replication**
Rida Bazzi and Maurice Herlihy

13:54 – 14:21 **Load Balanced Distributed Directories**
Shishir Rai, Gokarna Sharma, Costas Busch and Maurice Herlihy

14:21 – 14:33 **Brief Announcement: Optimal Self-Stabilizing Mobile Byzantine-Tolerant Regular Register with bounded timestamps**
Silvia Bonomi, Antonella Del Pozzo, Maria Potop-Butucaru and Sébastien Tixeuil

14:33 – 14:50 Break

Session 4: Shared Memory (Chair: Rida Bazzi)

14:50 – 15:17 **An Innovative Approach to Achieve Compositionality Efficiently using Multi-Version Object Based Transactional Systems (Best Student Paper)**
Chirag Juyal, Sandeep Kulkarni, Sweta Kumari, Sathya Peri, and Archit Somani

15:17 – 15:44 **An Adaptive Logging Framework for Persistent Memories**
Pavan Poudel and Gokarna Sharma

15:44 – 16:11 **Concurrent Lock-free Unbounded Priority Queue with Mutable Priorities**
Ivan Wabulya, Bapi Chatterjee, Ajoy K. Datta, Rashmi Niyoliya and Philippos Tsigas

16:11 – 16:30 Break

Session 5: Self-Stabilization (Chair: Sébastien Tixeuil)

16:30 – 16:57 **Self-Stabilization and Byzantine Tolerance for Maximal Matching**
Stephan Kunne, Johanne Cohen and Laurence Pilard

16:57 – 17:24 **Acyclic Strategy for Silent Self-Stabilization in Spanning Forests**
Karine Altisen, Stéphane Devismes and Anaïs Durand

17:24 – 17:36 **Brief Announcement: Time Efficient Self-Stabilizing Stable Marriage**
Joffroy Beauquier, Thibault Bernard, Janna Burman, Shay Kutten and Marie Laveau

17:50 – 18:50 **Business Meeting**

Tuesday, November 6

Session 6: Programmable Matter (Chair: Shuji Kijima)

- 9:15 – 9:42 **Bee’s Strategy Against Byzantines, Replacing Byzantine Participants**
Amitay Shaer, Shlomi Dolev, Silvia Bonomi, Michel Raynal and Roberto Baldoni
- 9:42 – 10:09 **Simple and Fast Approximate Counting and Leader Election in Populations**
Othon Michail, Paul Spirakis and Michail Theofilatos
- 10:09 – 10:21 **Brief Announcement: Deterministic Leader Election in Self-Organizing Particle Systems**
Rida Bazzi and Joseph Briones
- 10:21 – 10:40 Break

Session 7: Overlay Network I (Chair: Volker Turau)

- 10:40 – 11:07 **On Underlay-Aware Self-Stabilizing Overlay Networks**
Thorsten Götte, Christian Scheideler and Alexander Setzer
- 11:07 – 11:34 **Relays: A New Approach for the Finite Departure Problem in Overlay Networks**
Christian Scheideler and Alexander Setzer
- 11:34 – 13:00 Lunch

Session 8: Keynote 2 (Chair: Toshimitsu Masuzawa)

- 13:00 – 14:00 **Quantum Distributed Computing**
François Le Gall
- 14:00 – 14:15 Break

Session 9: Robots and Agents I (Chair: Shantanu Das)

- 14:15 – 14:42 **Exploration of Finite 2D Square Grid by a Metamorphic Robotic System (Best Paper)**
Keisuke Doi, Yukiko Yamauchi, Shuji Kijima and Masafumi Yamashita

- 14:42 – 15:09 **On Fast Pattern Formation by Autonomous Robots**
Ramachandran Vaidyanathan, Gokarna Sharma and Jerry Trahan
- 15:09 – 15:36 **Ring Exploration with Myopic Luminous Robots**
Fukuhito Ooshita and Sébastien Tixeuil
- 15:36 – 16:03 **Arbitrary Pattern Formation with Four Robots**
Quentin Bramas and Sébastien Tixeuil
- 18:45 – 21:00 **Banquet at Asakusa View Hotel**

Wednesday, November 7

Session 10: Keynote 3 (Chair: Taisuke Izumi)

9:15 – 10:15 **Local checkability: a self stabilization notion that impacts foundations of distributed computing**
Shay Kutten

10:15 – 10:30 Break

Session 11: Overlay Network II (Chair: Stéphane Devismes)

10:30 – 10:57 **A Self-Stabilizing Hashed Patricia Trie**
Till Knollmann and Christian Scheideler

10:57 – 11:24 **Self-stabilizing Overlays for high-dimensional Monotonic Searchability**
Michael Feldmann, Christina Kolb and Christian Scheideler

11:24 – 11:51 **A $O(\log n)$ Distributed Algorithm to Construct Routing Structures for Pub/Sub Systems**
Volker Turau

11:51 – 13:20 Lunch

Session 12: Robots and Agents II (Chair: Yuichi Sudo)

13:20 – 13:47 **Uniform Circle Formation for Swarms of Opaque Robots with Lights**
Caterina Feletti, Carlo Mereghetti and Beatrice Palano

13:47 – 14:14 **Searching with Increasing Speeds**
Leszek Gąsieniec, Shuji Kijima and Jie Min

14:14 – 14:41 **Gracefully Degrading Gathering in Dynamic Rings**
Marjorie Bournat, Swan Dubois and Franck Petit

14:41 – 14:53 **Brief Announcement: Feasibility of Weak Gathering in Connected-over-time Dynamic Rings**
Fukuhito Ooshita and Ajoy K. Datta

14:53 – 14:58 Closing