2014 IEEE Symposium on Robotic Intelligence in Informationally Structures Space

(RiiSS 2014)

Orlando, Florida, USA
9-12 December 2014
# TABLE OF CONTENTS

IEEE SSCI 2014 General Committee ........................................................................................................................................ vi
IEEE RiiSS 2014 Committee .................................................................................................................................................. vii
Keynote Talk: RiiSS’14 ............................................................................................................................................................ ix

Thursday, December 11

9:20AM-10:00AM

RiiSS’14 Keynote Talk

*Informationally Structured Space for Cognitive Robotics*
Naoyuki Kubota

10:20AM-12:00PM

Special Session: RiiSS’14 Session 1: Computational Intelligence for Cognitive Robotics I
Chair: Naoyuki Kubota

10:20AM  *Average Edit Distance Bacterial Mutation Algorithm for Effective Optimisation* .......... 1
Tiong Yew Tang, Simon Egerton, Janos Botzheim and Naoyuki Kubota

10:40AM  *Robust face recognition via transfer learning for robot partner*................................. 8
Noel Nuo wi Tay, Janos Botzheim, Chu Kiong Loo and Naoyuki Kubota

11:00AM  *Combining Pose Control and Angular Velocity Control for Motion Balance of Humanoid Robot Soccer EROS* .................................................................16
Azhar Aulia Saputra, Indra Adjı Sulistıjono, Achmad Subhan Khalilullah, Takahiro Takeda and Naoyuki Kubota

11:20AM  *Spiking Neural Network based Emotional Model for Robot Partner* ......................... 22
Janos Botzheim and Naoyuki Kubota

11:40AM  *Growing Neural Gas Based Conversation Selection Model for Robot Partner and Human Communication System* .................................................................28
Shogo Yoshida and Naoyuki Kubota

1:30PM-3:10PM

RiiSS’14 Session 2: Intelligent Robots
Chair: Janos Botzheim

1:30PM  *An Adaptive Force Reflective Teleoperation Control using Online Environment Impedance Estimation* ..........................................................................................33
Faezeh Heydari Khabbaz, Andrew Goldenberg and James Drake

1:50PM  *Development and Performance Comparison of Extended Kalman Filter and Particle Filter for Self-Reconfigurable Mobile Robots* ....................................................41
Peter Won, Mohammad Biglarbegian and William Melek

2:10PM  *Autonomous Motion Primitive Segmentation of Actions for Incremental Imitative Learning of Humanoid* .................................................................................................47
Farhan Dawood and Chu Kiong Loo

2:30PM  *A Computational Approach to Parameter Identification of Spatially Distributed Nonlinear Systems with Unknown Initial Conditions* ........................................55
Josip Kasac, Vladimir Milic, Josip Stepanic and Gyula Mester

2:50PM  *Multi-Robots Coverage Approach* ......................................................................................62
Ryad Chellali and Khelifa Baizid
3:30PM-5:10PM

Special Session: RiiSS’14 Session 3: Human-centric Robotics I
Chair: Takenori Obo

3:30PM  Medical Interview Training Using Depressed Patient Robot in Psychiatric Education ............................................................................................................68
Takuya Hashimoto, Ryo Kurimoto, Hideyuki Nakane and Hiroshi Kobayashi

3:50PM  A Route Planning for Disaster Waste Disposal Based on Robot Technology .................................................74
Takahiro Takeda, Yuki Mori, Naoyuki Kubota and Yasuhiro Arai

4:10PM  Fuzzy Neural Network based Activity Estimation for Recording Human Daily Activity ............................................................80
Manabu Nii, Kazunobu Takahama, Takuya Iwamoto, Takafumi Matsuda, Yuki Matsumoto and Kazusuke Maenaka

4:30PM  Behavior Pattern Learning for Robot Partner based on Growing Neural Networks in Informationally Structured Space .....................................................................................86
Takenori Obo and Naoyuki Kubota

Friday, December 12

9:30AM-10:30AM

Special Session: RiiSS’14 Session 4: Computational Intelligence for Cognitive Robotics II
Chair: Chu Kiong Loo

9:30AM  Self-generation of reward in reinforcement learning by universal rules of interaction with the external environment...............................................................................................92
Kentarou Kurashige and Kaoru Nikaido

9:50AM  Facial Pose Estimation via Dense and Sparse Represenation ..........................................................98
Hui Yu and Honghai Liu

10:10AM  Affective Communication Robot Partners using Associative Memory with Mood Congruency Effects ..............................................................................................................104
Naoki Masuyama, MD. Nazrul Islam and Chu Loo

11:00AM-12:00PM

Special Session: RiiSS’14 Session 5: Human-centric Robotics II
Chair: Eri Sato-Shimokawara

11:00AM  Application of Stretchable Strain Sensor for Pneumatic Artificial Muscle ..................112
Hiroyuki Nakamoto, Soushi Oida, Hideo Ootaka, Mitsunori Tada, Ichiro Hirata, Futoshi Kobayashi and Fumio Kojima

11:20AM  Improvement of P-CUBE: Algorithm Education Tool for Visually Impaired ...................117
Shun Kakehashi, Tatsuo Motoyoshi, Ken’ichi Koyanagi, Toru Oshima, Hiroyuki Matsumoto and Hiroshi Kawakami

11:40AM  Acquiring Personal Keywords from a Conversation for a Human-robot Communication ..........................................................................................123
Shun Nomura, Haeyeon Lee, Eri Shimokawara, Kazuyoshi Wada and Toru Yamaguchi

1:30PM-3:10PM

Special Session: RiiSS’14 Session 6: Computational Intelligence for Cognitive Robotics III
Chair: Janos Botzheim

1:30PM  Evolutionary Swarm Robotics Approach to a Pursuit Problem .........................................................129
Toshiyuki Yasuda, Kazuhiro Ohkura, Tosei Nomura and Yoshiyuki Matsumura

1:50PM  Unknown Object Extraction based on Plane Detection in 3D Space .......................................................135
Hiroyuki Masuta, Makino Shinichiro, Lim Hun-ok, Motoyoshi Tatsuo, Koyanagi Ken’ichi and Oshima Toru
2:10PM  *Robot Team Learning Enhancement Using Human Advice*  ............................................. 142
  Justin Girard and M. Reza Emami

2:30PM  *Slip Based Pick-and-Place by Universal Robot Hand with Force/Torque Sensors*  ...... 149
  Futoshi Kobayashi, Hayato Kanno, Hiroyuki Nakamoto and Fumio Kojima

AUTHOR INDEX .................................................................................................................................... 153