

## **The Fifteenth International Symposium on ARTIFICIAL LIFE AND ROBOTICS (AROB 15th '10)**

### **February 4 (Thursday)**

**Room E: 10:30-10:55**

#### **Opening Ceremony**

**Chair: J. Y. Shim (Kangnam University, Korea)**

#### **Welcome Addresses**

- |                                    |                                                                             |
|------------------------------------|-----------------------------------------------------------------------------|
| <b>1. General Chairman of AROB</b> | M. Sugisaka (Nippon Bunri University, Japan)                                |
| <b>2. President of NBU</b>         | T. Hirai (Nippon Bunri University NBU, Japan)                               |
| <b>3. Vice Chairman of AROB</b>    | J. Casti (International Institute for Applied Systems<br>Analysis, Austria) |
| <b>4. Vice Chairman of AROB</b>    | Y. G. Zhang (Academia Sinica, China)                                        |
| <b>5. Vice Chairman of AROB</b>    | J. J. Lee (KAIST, Korea)                                                    |
| <b>6. Vice Chairman of AROB</b>    | H. Lund ( Technical University of Denmark, Denmark)                         |

### **February 5 (Friday)**

**Hotel Shiragiku: 18:25-20:35**

#### **AROB Award Ceremony**

**Chair: K. Naitoh (Waseda University, Japan)**

#### **Banquet**

**Chair: J. M. Lee (Pusan National University, Korea)**

#### **Welcome Addresses**

H. Tanaka (Tokyo Medical and Dental University, Japan)  
M. Oswald (Vienna University of Technology, Hungary)  
Y-M. Jia (Beihang University, China)  
K. L. Su(National Yunlin University of Science & Technology, Taiwan)  
L. Pagliarini (Technical University of Denmark, Denmark)

## TECHNICAL PAPER INDEX

### **February 4 (Thursday)**

#### **Room E**

**10:55~11:45 Plenary Talk**

**Chair J. J. Lee (KAIST, Korea)**

PT1 *From dream to reality: Snake-like, spider-like robots*  
S. Hirose (Tokyo Institute of Technology, Japan)

### **February 5 (Friday)**

#### **Room E**

**10:15~11:05 Plenary Talk**

**Chair Y. G. Zhang (Academia Sinica, China)**

PT2 *Extreme events in human society: The events observatory and simulator*  
J. Casti (International Institute for Applied Systems Analysis, Austria)

**15:55~16:45 Plenary Talk**

**Chair H. Tanaka (Tokyo Medical and Dental University, Japan)**

PT3 *Robomusic with modular playware*  
H. Lund (Technical University of Denmark, Denmark)

#### **Room D**

**13:00~15:35 Invited Talks Session**

**Chair K. Shimohara (Doshisha University, Japan)**

IT1 *XML-based genetic programming framework: Design philosophy, implementation and applications*  
I. Tanev (Doshisha University, Japan)

IT2 *Brain's doing in its resting-state: Default mode network as an inside story within the brain*  
J-Q. Liu (Doshisha University, Japan)

IT3 *Wearing the playware*  
L. Pagliarini (Technical University of Denmark, Denmark)

## **February 4 (Thursday)**

### **8:00~Registration**

#### **Room A**

#### **8:40~10:10 OS19 Intuitive human-system interaction**

**Chair: M. Yokota (Fukuoka Institute of Technology, Japan)**

**Co-Chair: T. Oka (Fukuoka Institute of Technology, Japan)**

OS19-1 *Towards natural intelligence modeling as a formal system based on mental image directed semantic theory (Part 1)*

M. Yokota, H. Li, H. Quan, K. Sugita (Fukuoka Institute of Technology, Japan)

T. Oka (Nihon University, Japan)

OS19-2 *Towards natural intelligence modeling as a formal system based on mental image directed semantic theory (Part 2)*

M. Yokota, R. Zhao, T. Tometsuka, K. Sugita (Fukuoka Institute of Technology, Japan)

T. Oka (Nihon University, Japan)

OS19-3 *Commanding a humanoid to move objects in a multimodel language*

T. Oka (Nihon University, Japan)

M. Yokota, K. Sugita (Fukuoka Institute of Technology, Japan)

OS19-4 *Face detection and face authentication based on 3D face image*

H. Kamitomo, C. Lu (Fukuoka Institute of Technology, Japan)

OS19-5 *Stripes extraction technique of projection pattern for 3D shape measurement*

K. Sun, C. Lu (Fukuoka Institute of Technology, Japan)

OS19-6 *A software framework for universal multimedia access*

Y. Maeda, K. Sugita (Fukuoka Institute of Technology, Japan)

T. Oka (Nihon University, Japan)

M. Yokota (Fukuoka Institute of Technology, Japan)

#### **12:40~13:55 OS16 Embracing complexity in natural intelligence**

**Chair: Y. Ishida (Toyohashi University of Technology, Japan)**

**Co-Chair: T. Okamoto (Kanagawa Institute of Technology, Japan)**

OS16-1 *Evaluations for an immunity-based anomaly detection with dynamic updating of profiles*

T. Okamoto (Kanagawa Institute of Technology, Japan)

Y. Ishida (Toyohashi University of Technology, Japan)

OS16-2 *A secure routing scheme for mobile wireless sensor networks*

Y. Watanabe, Tong Tran Nhat Linh (Nagoya City University, Japan)

OS16-3 *Prediction of space weather by adaptive information processing*

M. Tokumitsu, Y. Ishida (Toyohashi University of Technology, Japan)

S. Watari (National Institute of Information and Communications Technology, Japan)

K. Kitamura (Tokuyama College of Technology, Japan)

OS16-4 *An adaptive sensor network for home intrusion detection by human behavior profiling*  
M. Tokumitsu, M. Murakami, Y. Ishida (Toyohashi University of Technology, Japan)

OS16-5 *A network visualization of stable matching in stable marriage problem*  
Y. Morizumi, T. Hayashi, Y. Ishida (Toyohashi University of Technology, Japan)

**14:15~16:00 OS1 System sensing and control**

**Chair: M. Uchida (The University of Electro-Communications, Japan)**

**Co-Chair: T. Mizuno (Tokyo Polytechnic University, Japan)**

OS1-1 *Broadband robust PWM power amplifier using approximate 2DOF digital control*  
T. Nomura, H. Iwata, K. Higuchi, N. Nakano (The University of Electro-Communications, Japan)

OS1-2 *A consideration on immunity-based reinforcement learning with continuous states*  
S. Hosokawa, K. Nakano (The University of Electro-Communications, Japan)

OS1-3 *Investigation of voluntary movements in auditory stimulated conditions by integrative measurement*  
K. Saito, Y. I. Park, M. Uchida (The University of Electro-Communications, Japan)

OS1-4 *Swing analysis of body-parts motion accompanied by apparent movement*  
Y. I. Park, K. Saito, M. Uchida (The University of Electro-Communications, Japan)

OS1-5 *EMG activity of force sensation evoked by vibration stimulation*  
T. Mizuno, M. Sato, M. Kimura, Y. Kume (Tokyo Polytechnic University, Japan)

OS1-6 *Emotion spectrum analysis for daily repetitive mental workload*  
A. Nozawa, K. Karita (Myojo University, Japan)

OS1-7 *Single-trial analysis of voice stimulus evoked potentials*  
H. Tanaka, T. Matsuoka (Kogakuin University, Japan)

**16:05~17:35 GS12 Innovative computations**

**Chair: K-L. Su (National Yunlin University of Science & Technology, Taiwan)**

GS12-1 *Fast processing method for PIV using GPGPU*  
K. Miyazaki, K. Kawasue (University of Miyazaki, Japan)

GS12-2 *Data envelopment analysis for evaluating Japanese universities*  
K. Inoue, R. Gejima, S. Aoki (Osaka Prefecture University, Japan)

GS12-3 *Data envelopment analysis for supply chain*  
A. Naito, R. Gejima, K. Inoue, S. Aoki, H. Tsuji (Osaka Prefecture University, Japan)

GS12-4 *On a Brownian cellular automaton implementing self-reproducing loop*  
Koji Ono, T. Isokawa (University of Hyogo, Japan)  
F. Peper (Nano ICT Group, Japan)  
Jia Lee (ChongQing University, China)  
A. Saitoh, N. Kamiura, N. Matsui (University of Hyogo, Japan)

GS12-5 *An application of self-reproducing loops to defect-tolerant computation on self-timed cellular automaton*

Koji Ono, T. Isokawa (University of Hyogo, Japan)  
F. Peper (Nano ICT Group, Japan)  
A. Saitoh, N. Kamiura, N. Matsui (University of Hyogo, Japan)

GS12-6 *Management of experience data for rapid adaptation to new policies based on bayesian significance evaluation*

Saifuddin Md. Tareeq (The Graduate University for Advanced Studies)  
T. Inamura (National Institute of Informatics, Japan)

**Room B**

**8:40~10:10 OS20 Special environment localization and navigation**

**Chair: J. M. Lee (Pusan National University, Korea)**

OS20-1 *A robust control of mobile inverted pendulum using single accelerometer*

H.U. Ha, S.M. Ryu, J.M. Lee (Pusan National University, Korea)

OS20-2 *Localization of multiple robots in a wide workspace*

J.H. Park, W.S. Jang, J.M. Lee (Pusan National University, Korea)

OS20-3 *Pallet recognition and driving method for pallet-engaging of unmanned autonomous forklift*

J.J. Park, J.M. Kim, K.H. Jung, S.S. Kim, (Pusan National University, Korea)

OS20-4 *Monitoring the level in a large structure localization method*

J.M. Kim, H.J. Kim (Pusan National University, Korea)

OS20-5 *Performance improvement of outdoor localization using classified sensing points*

T.B. Kwon, J.B. Song, Y.J. Lee (Korea University, Korea)

OS20-6 *Collision detection of robot manipulator in cryogenic environment*

S.H. Lee, K.H. Yu, M.C. Lee (Pusan National University, Korea)

**12:40~13:55 GS13 Mobile vehicles I**

**Chair: I. Zunaidi (TATi University College, Malaysia)**

GS13-1 *Trajectory tracking control of mobile robot moving along curved wall using imaginary wall*

S. Furuno, K. Yanagi (Kitakyushu National College of Technology, Japan),  
M. Kobayashi (Kitakyushu Institute of Technology, Japan),  
G. Hirano (Kinki University, Japan)

GS13-2 *Vision-based obstacle avoidance system for autonomous mobile robot in outdoor environment*

J.E. Jung, K.S. Lee, H.G. Park (Pusan National University, Korea)  
Y.H. Koh (Futronic Co., Ltd., Korea)  
M.H. Lee (Pusan National University, Korea)

GS13-3 *Cooperative localization by using knowledge of self-organized regularity*

M. Kubo, T. Matsubara, S. Shimizu, H. Sato (National Defense Academy, Japan)

GS13-4 *A collaborative localization tolerant to recognition error by double check particle exchange*

T. Matsubara, M. Kubo, Y. Murachi (National Defense Academy, Japan)

GS13-5 *Study on the route extraction based on the image processing*

J. Wang (Beijing Jiaotong University, China)  
M. Sugisaka (Nippon Bunri University, Japan)

**14:15~16:00 OS2 MOT and interdisciplinary research**

**Chair: T. Ito(Ube National College of Technology, Japan)**

**Co-Chair: S. Matsuno (Ube National College of Technology, Japan)**

OS2-1 *Estimating stochastic volatility models of stock returns in Chinese markets*

S.Q. Lu, S. Xie (Fudan University, China)  
T. Ito(Ube National College of Technology, Japan)

OS2-2 *An analysis of organizational behaviors in the Keiretsu of Mazda*

T. Ito, S. Tagawa (Ube National College of Technology, Japan)  
M. Sakamoto(University of Miyazaki, Japan, Japan)  
S.Q. Lu (Fudan University, China)

OS2-3 *An analysis of interactive influence in the Keiretsu of Mazda*

S. Matsuno, T. Ito (Ube National College of Technology, Japan)  
Z. Xia (Wenzhou University, China)  
M. Sakamoto(University of Miyazaki, Japan, Japan)

OS2-4 *The connection law and networks*

T. Ito (Ube National College of Technology, Japan)  
Y. Ma (Wuhan University of Science and Engineering, China)  
M. Sakamoto(Miyazaki University, Japan)

OS2-5 *Discovering the efficient organization structure: horizontal versus vertical*

S. Ikeda (University of Miyazaki, Japan)  
T. Ito (Ube National College of Technology, Japan)  
M. Sakamoto (University of Miyazaki, Japan)

OS2-6 *A centrality analysis of transaction relationship of Panasonic*

Y. S. Park (Ube National College of Technology, Japan)  
Y. Chen (Kyushu International University, Japan)

OS2-7 *A study of accounting standard-setting using graph theory*

K. Ogata (University of Nagasaki, Japan)

**16:05~17:35 OS15 Artificial intelligent**

**Chair: Mohamed Rizon (King Saud University, Saudi Arabia)**

**Co-Chair: Ali Selamat (Universiti Teknologi Malaysia, Malaysia)**

OS15-1 *Fast shape matching and retrieval based on approximate dynamic space warping*

Naif Alajlan (King Saud University, Saudi Arabia)

OS15-2 *Prediction model of permeability from well logs using type-2 fuzzy logic systems*

Sunday Olusanya Olatunji, Ali Selamat (Universiti Teknologi Malaysia, Malaysia)  
Abdul Azeez, Abdul Raheem (King Fahd University of Petroleum and Mineral, Saudi Arabia )

**OS15-3 *Real-time iris detection***

Mohamed Rizon (King Saud University, Saudi Arabia)  
Chai Tong Yuen (Universiti Tunku Abdul Rahman, Malaysia)  
Ali S. AlMejrad (King Saud University, Saudi Arabia)

**OS15-4 *Comparison of human emotion recognition through different set of EEG channels***

M. Murugappan (Universiti Malaysia Perlis, Malaysia)  
M. Rizon (King Saud University, Saudi Arabia)  
R. Nagarajan(Universiti Malaysia Perlis, Malaysia)  
Ali S. AlMejrad (King Saud University, Saudi Arabia)  
S. Yaacob (Universiti Malaysia Perlis, Malaysia)

**OS15-5 *Design of intelligent system for speech monitoring and treatment of low and excessive vocal intensity***

Ali S. AlMejrad (King Saud University, Saudi Arabia)

**OS15-6 *Modified relevance feedback for content based image retrieval using support vector machine***

Ali Selamat, Pei-Geok Lim (Universiti Teknologi Malaysia, Malaysia)

**Room C**

**8:40~10:10 GS7 Evolutionary computations**

**Chair: M.K. James (Tokyo University of Information Sciences, Japan)**

**GS7-1 *Mixed constrained image filter design using particle swarm optimization***

Z. Bao, T. Watanabe (Waseda University, Japan)

**GS7-2 *A reinforcement learning with switching controllers for continuous action space***

M. Nagayoshi (Niigata College of Nursing, Japan),  
H. Murao, H. Tamaki (Kobe Univ., Japan)

**GS7-3 *A framework for embodied evolution with pre-evaluation applied to a biped robot***

J. Nakai, T. Arita (Graduate School of Information Science, Nagoya University, Japan)

**GS7-4 *Efficient flooding method for wireless sensor networks based on discrete particle swarm optimization computing multiple forwarding nodes sets***

J. Nagashima, A. Utani, H. Yamamoto (Tokyo City University, Japan)

**GS7-5 *Fixed column primer for Boolean Matrix multiplication with DNA computing***

N.Rajae, H.Aoyagi, O.Ono (Meiji University, Japan)

**GS7-6 *Applying soft computing for remote sensing data composite algorithms***

Kenneth J. Mackin, T. Yamaguchi, J.G. Park, E. Nunohiro, K. Matsushita (Tokyo University of Information Sciences, Japan)  
Y. Yanagisawa, M. Igarashi (Nihon University, Japan)

**12:40~13:55 OS21 Molecular computing**

**Chair: M. Oswald (Vienna University of Technology, Hungary)**

**Co-Chair: Y. Suzuki (Nagaya University, Japan)**

**OS21-1 *P-system communications architectures configuration based on growing SOM***

A. Gutiérrez, S. Delgado, S. Gómez (Universidad Politécnica de Madrid, Spain)

OS21-2 *Hardware circuit for the application of evolution rules in a transition P-system.*  
V. Martínez, S. Alonso, A. Gutiérrez (Universidad Politécnica de Madrid, Spain)

OS21-3 *Calculating maximal multisets by using RAM as support*  
A. Arteta, F Arroyo, A. Goñi (Universidad Politécnica de Madrid, Spain)

OS21-4 *Investigation of the efficient protection from Influenza pandemic using CARMS*  
Y. Suzuki (Nagoya University, Japan)  
K. Tsunoda (Kobe University, Japan)  
K. Shinya (Nagoya University, Japan)

OS21-5 *Organization levels in P systems*  
M. Oswald (Vienna University of Technology, Hungary)

**14:15~16:00 GS2 Artificial intelligence**  
**Chair: T. Fuchida (Kagoshima University, Japan)**

GS2-1 *Reinforcement learning using Voronoi space division*  
Kathy Thi Aung, T. Fuchida (Kagoshima University, Japan)

GS2-2 *Machine learning approach to 9-dof robotic arm control*  
S.Nishioka, S.Maeda (Kyoto University, Japan)  
Y.Nakamura (Osaka University, Japan)  
T.Ueno (Kyoto University, Japan)  
H.Ishiguro (Osaka University, Japan)  
S.Ishii (Kyoto University, Japan)

GS2-3 *Consideration on gesture recognition based on multilayer neural network by using input device of home gaming console*  
I. Iimura, T. Fujiki (Prefectural University of Kumamoto, Japan)  
H. Tsurusawa (Oita National College of Technology, Japan)  
S. Nakayama (Kagoshima University, Japan)

GS2-4 *A learning Petri net model based on reinforcement learning*  
L-B. Feng, M. Obayashi, T. Kuremoto, K. Kobayashi (Yamaguchi University, Japan)

GS2-5 *On detecting a human and its body direction from a video*  
Y. Nakashima, J-K. Tan, S. Ishikawa, T. Morie (Kyushu Institute of Technology, Japan)

GS2-6 *Parallel computing method of extraction of frequent occurrence pattern of sea surface temperature from satellite data*  
A. Niimi, T. Yamaguchi, O. Konishi (Future University-Hakodate, Japan)

GS2-7 *Cultural evolution of compositional language under multiple cognition of meanings*  
R. Matoba, S. Sakamoto, T. Hashimoto (Japan Advanced Institute of Science and Technology, Japan)

**16:05~17:35 OS8 Intelligent control and applications**

**Chair: K-H. Hsia (Far East University, Taiwan)**

**Co-Chair: C-C. Wang (Far East University, Taiwan)**

OS8-1 *Production scheduling and process planning based on mixed-integer evolutionary algorithm*

Y-C. Lin, Y-C. Lin (WuFeng Institute of Technology, Taiwan)

K-L. Su (National Yunlin University of Science and Technology, Taiwan)

OS8-2 *Further study on camera position estimation from image by ANFIS*

S-F. Lien (National Yunlin University of Science and Technology, Taiwan)

K-H. Hsia (Far East University, Taiwan)

C-C. Wang (Chienkuo Technology University, Taiwan)

T-E Lee (National Yunlin University of Science and Technology, Taiwan)

J-P. Su (Overseas Chinese University, Taiwan)

OS8-3 *Gaussian radial basis function neural network controller of synchronous reluctance motor in electric motorcycle applications*

C-A. Chen (Automotive Research and Testing Center, Taiwan)

H-K. Chiang, W-B. Lin (National Yunlin University of Science and Technology, Taiwan)

OS8-4 *Implementation of robust complex extended Kalman filter with LabVIEW for detection in distorted signal*

W-B. Lin (Far East University, Taiwan)

H-K. Chiang (National Yunlin University of Science and Technology, Taiwan)

K-R. Shih (National Formosa University, Taiwan)

C-A. Chen (Automotive Research and Testing Center, Taiwan)

OS8-5 *Fuzzy PID control for an overhead crane using hybrid optimization approach*

C-N. Ko (Nan-Kai University of Technology, Taiwan)

C-C. Yang (Hsiuping Institute of Technology, Taiwan)

G-Y. Liu (Nan-Kai University of Technology, Taiwan)

K-L. Su (National Yunlin University of Science and Technology, Taiwan)

OS8-6 *Parameter estimation of chaotic systems by nonlinear time-varying evolution PSO method*

C-N. Ko, Y-Y. Fu, C-M. Lee (Nan-Kai University of Technology, Taiwan)

C-J. Wu (National Yunlin University of Science and Technology, Taiwan)

**Room D**

**8:40~10:10 OS25 Artificial application & Artificial and green technology I**

**Chair: Dong-Hwa Kim (Hanbat University, Korea)**

OS25-1 *Spatial information of game for body interface using webcam*

Y. J. Lee (Jeonju University, Korea)

OS25-2 *A study on accurate time synchronization protocol with improved SNTP for smart AMR*

S.Y Oh, C.H. Lee (ADMOTEC Inc., Korea)

*OS25-3 Calculation of arm parameter for surface scanning with axis moment*

J.C. Jeong, H.C. Shin (University of Science & Technology, Korea)  
D.D. Lee, C.H. Lee (ADMOTTECH Inc., Korea)

*OS25-4 Development of interactive wireless AMR with distribution automation system*

C.H. Yoon, D.D. Lee, C.H. Lee (ADMOTTECH Inc., Korea)

*OS25-5 Improved SNTP for accurate time synchronization in smart AMR systems*

S.Y. Oh, D.D. Lee, C.H. Lee (ADMOTTECH Inc., Korea)

*OS25-6 Personal color decision system using fuzzy logic*

J.M. Oh, M.S. Hong, J.T. Kim, D.W. Lee, C.W. Son, G. Lee (Hannam University, Korea)

**12:40~13:55 GS8 Intelligent control & modeling**

**Chair: S.Y. Yi** (Seoul National University of Technology, Korea)

*GS8-1 Evaluation of cycling posture considering the difference of saddle height with principal component analysis based on leg electromyography*

S. Matsumoto, T. Tokuyasu (Oita National College of Technology, Japan)  
Koji Hirakoba (Kyushu Institute of Technology, Japan)  
Keichi Ohba (Oita National College of Technology, Japan)

*GS8-2 A control system based on the fuzzy neural network for a robot joint*

H. Zhao (Shanghai Institute of Technology, China)  
M. Sugisaka (Nippon Bunri University, Japan)

*GS8-3 Proposal of sensors for robot supporting to take medicines on time*

Y. Kitazono, X. Zheng, S. Nakashima, S. Yang, S. Serikawa (Kyushu Institute of Technology, Japan)

*GS8-4 Development and case study of trend analysis software based on FACT-Graph*

R. Saga (Kanagawa Institute of Technology, Japan)  
H. Tsuji, T. Miyamoto (Osaka Prefecture University, Japan)  
K. Tabata (Kanagawa Institute of Technology, Japan)

*GS8-5 Gait planning for a robot dog*

S.Y. Yi (Seoul National University of Technology, Korea)  
D.S. Choi (DASA Corp., Korea)

**14:15~16:00 OS9 Intelligent system and application**

**Chair: J-T. Zou** (National Formosa University, Taiwan)

**Co-Chair: K-L. Su** (National Yunlin University of Science & Technology, Taiwan)

*OS9-1 The development of the omnidirectional home care mobile robot*

J-T. Zou (National Formosa University, Taiwan)  
F-C. Chiang (WuFeng Institute of Technology, Taiwan)

*OS9-2 Path planning of the multiple mobile robot system*

S-V. Shiau, K-L. Su (National Yunlin University of Science & Technology, Taiwan)  
C-C. Wang (Chienkuo Technology University, Taiwan)  
J-H. Guo (National Yunlin University of Science & Technology, Taiwan)

*OS9-3 Multi-level multi-sensor based security system for intelligent home*

S-H Chia, K-L Su, S-V Shiau (National Yunlin University of Science & Technology, Taiwan)  
T-L Chien (Wu-Feng Institute of Technology, Taiwan)

*OS9-4 Multisensor fusion based gas detection module*

J-H. Guo (National Yunlin University of Science & Technology, Taiwan)  
I-C. Chien (National Central University, Taiwan)  
K-L. Su, C-J. Wu (National Yunlin University of Science & Technology, Taiwan)

*OS9-5 A fast parameters estimation for nonlinear multi-regressions based on choquet integral with quantum-behaved particle swarm optimization*

Y-M. Jau, C-J. Wu, J-T. Jeng (National Yunlin University of Science & Technology, Taiwan)

*OS9-6 Application of a remote image surveillance system in a robotic weapon*

C-C. Wang (Chienkuo Technology University, Taiwan)  
K-H. Hsia (Far East University, Taiwan)  
K-L. Su (National Yunlin University of Science & Technology, Taiwan)  
Y-C. Hsieh, C-L. Lin (Chienkuo Technology University, Taiwan)

**16:05~17:35 GS18 Robotics II**

**Chair: J.M. Lee (Pusan National University, Korea)**

*GS18-1 Human tracking with variable prediction steps based on Kullback-Leibler divergence*

N. Takemura, Y. Nakamura (Osaka University, Japan)  
Y. Matsumoto (AIST, Japan)  
H. Ishiguro (Osaka University, Japan)

*GS18-2 Optimal path planning with holonomic mobile robot using localization vision sensor*

D.S. Lee, C.S. Kim, S.Y. Kim, K.S. Lee, H.G. Park (Pusan National University, Korea)  
Y.H. Koh (Futronic Co., Ltd., Korea)  
M.H. Lee (Pusan National University, Korea)

*GS18-3 Efficient robotic memory controller for long-term planning*

Hassab Elgawi Osman (Tokyo Institute of Technology, Japan)

*GS18-4 Construction of the robot control system with use of pointing action and voice*

Y. Takenaka, N. Abe, Y. Tabuchi (Kyushu Institute of Technology, Japan)  
H. Taki (Wakayama University, Japan)  
Shoujie He (VuCOMP, USA)

*GS18-5 The water-tank test of novel underwater positioning system based on sensor networks*

Bin Fu, Lian Lian (Shanghai Jiao Tong University, China)  
Zhang Feifei, M. Ito (Tokyo University of Marine Science and Technology, Japan)  
Li Wen tao (Shanghai Jiao Tong University, China)

GS18-6 *Countering asymmetric situations with distributed artificial life and robotics approach*  
Peter Sapaty (National Academy of Sciences, Ukraine)  
M. Sugisaka (Nippon Bunri University, Japan)

## **February 5 (Friday)**

### **8:00~ Registration**

#### **Room A**

##### **8:40~9:55 OS17 Intelligent classification**

**Chair: S. Omatu (Osaka Prefecture University, Japan)**

**Co-Chair: J. A. Dargham (University Malaysia Sabah, Malaysia)**

OS17-1 *Intelligent classification of bills by neural networks*  
S. Omatu, M. Yoshioka, H. Yanagimoto (Osaka Prefecture University, Japan)

OS17-2 *Signal separation by independent component analysis*  
S. Omatu, M. Yoshioka, H. Yanagimoto (Osaka Prefecture University, Japan)

OS17-3 *The land cover estimation with ALOS satellite image using neural-network*  
Y. Tsuchida, S. Omatu, M. Yoshioka (Osaka Prefecture University, Japan)

OS17-4 *The analysis of Japanese voice sound by using real-time spectral analysis*  
H. Nakatsuji, S. Omatu (Osaka Prefecture University, Japan)

OS17-5 *Selection of parameters in design of real-time spectral analysis*  
H. Nakatsuji, S. Omatu (Osaka Prefecture University, Japan)

##### **11:05~12:05 OS7 Soft robotics**

**Chair: Kunihiro Nakazono (University of the Ryukyus, Japan)**

OS7-1 *GA simulation of evolution of the hierarchical module structure on gene networks*  
S. Nakashima, K. Kurata (University of the Ryukyus, Japan)

OS7-2 *Swing-up control of the acrobot using genetic programming considering an actuator dynamics*  
R. Fukushima, E. Uezato (University of the Ryukyus, Japan)

OS7-3 *Neurocontrol for a rotary crane system with disturbance*  
K. Tamanoi, K. Nakazono (University of the Ryukyus, Japan)

OS7-4 *Particle swarm optimization with genetic recombination - A hybrid evolutionary algorithm*  
S-C. Duong, H. Kinjo, E. Uezato (University of the Ryukyus, Japan)  
T. Yamamoto (Tokushima Technology College, Japan)

##### **13:00~14:00 GS3 Artificial life & Brain science**

**Chair: M. Nakamkura (Research Institute of Systems Control)**

GS3-1 *Why we talk?: Altruism and multilevel selection in the origin of language*  
K. Sugiura, T. Arita (Graduate School of Information Science, Nagoya University, Japan)

*GS3-2 A variety of competitive properties arises from STDP incorporating metaplastic regulation*

S. Kubota (Yamagata University, Japan)  
J. Rubin (University of Pittsburgh, USA)  
T. Kitajima (Yamagata University, Japan)  
T. Nakamura (Yamagata University, Japan)

*GS3-3 Automatic estimation of light sleep level during short nap*

B. Wang (East China University of Science and Technology, China)  
T. Sugi (Saga University, Japan)  
X. Wang (East China University of Science and Technology, China)  
Shuichiro Shirakawa (National Centre of Neurology and Psychiatry, Japan)  
M. Nakamura (Research Institute of Systems Control, Japan)

*GS3-4 Evolving behavior sequences for a humanoid entertainment robot*

W-P. Lee, J-S. Jong, T-H. Yang (National Sun Yat-sen University, Taiwan)

**14:05~15:35 OS22 Brain-like intelligence and biomedical applications**

**Chair: N. Homma (Tohoku University, Japan)**

**Co-Chair: N. Sugita (Tohoku University, Japan)**

*OS22-1 A guess for natural neural activity and a suggestion on the modification of the ANN*

Y. G. Zhang (The Institute of Systems Science, China)  
M. Sugisaka (Nippon Bunri University, Japan)

*OS22-2 Research on automatic text summary based on latent semantic indexing*

D. Ai, Y. Zheng, D. Zhang (University of Science and Technology of Beijing, China)

*OS22-3 Sensitivity improvement of automatic pulmonary nodules detection in chest X-ray CT images*

S. Shimoyama, N. Homma, T. Ishibashi, M. Yoshizawa (Tohoku University, Japan)

*OS22-4 A time variant seasonal ARIMA model for lung tumor motion prediction*

K. Ichiji, M. Sakai, N. Homma, Y. Takai, M. Yoshizawa (Tohoku University, Japan)

*OS22-5 Pulse transmission time based on temporal difference in the instantaneous phase between electrocardiogram and photoplethysmogram signals*

M. Murakoshi, M. Yoshizawa, N. Sugita, M. Abe, N. Homma, T. Yambe, S. Nitta (Tohoku University, Japan)

**16:45~17:30 GS11 Image Processing II**

**Chair: C-N. Ko (Nan-Kai University of Technology, Taiwan)**

*GS11-1 Segmentation of artery areas on none-enhanced fresh blood imaging based on dot enhancement filter and 3-D region growing method*

A. Yamamoto, T. Nishizaki, H.S. Kim, J-K. Tan, S. Ishikawa (Kyushu Institute of Technology, Japan)

*GS11-2 Construction of a sense of force feedback and vision for micro-objects*

R.Uehara, E.Hayashi (Kyushu Institute of Technology, Japan)

*GS11-3 A real-time face detection and recognition system for mobile robot in the complex background*

S. Chen, T. Zhang, C. Zhang, Y. Cheng (Tsinghua University, China)

## **Room B**

### **8:40~9:40 OS27 Machine learning and computer vision**

**Chair: H. Hamdan (SUPELEC, France)**

**Co-Chair: Khaled Al Mutib (King Saud University, Saudi Arabia)**

#### *OS27-1 Biomimetic control architecture for robotic cooperative tasks*

N. Bizdoaca (University of Craiova, Romania)

H. Hamdan (SUPELEC, France)

D. Coman, A. Petrisor, E. Bizdoaca (University of Craiova, Romania)

#### *OS27-2 ANN dexterous robotics hand optimal control methodology grasping and manipulation forces optimization*

Ebrahim Matter al-Gallaf (University of Bahrain, Kingdom of Bahrain)

Khaled Al Mutib (King Saud University, Saudi Arabia)

Hani Hamdan (SUPELEC, France)

#### *OS27-3 Dense stereovision using mono-CCD color cameras*

Hachem Halawana (LAGIS, USTL)

Hani Hamdan (SUPELEC, France)

### **11:05~12:05 GS14 Mobile vehicles II**

**Chair: J. Wang (Beijing Jiaotong University, China)**

#### *GS14-1 Intelligent OkiKoSenPBX1 security patrol robot via network and map-based route planning*

Mbaïtiga Zacharie (Okinawa National College of Technology, Japan)

#### *GS14-2 Obstacle arrangement detection using multichannel ultrasonic sonar for indoor mobile robots*

K. Okuda, M. Miyake, H. Takai (Hiroshima City University, Japan)

K. Tachibana (Osaka Gakuin University, Japan)

#### *GS14-3 A collision avoidance achievement of vehicle warning system in intersection via DSRC*

C. W. Hsu, C. N. Liang, L. Y. Ke, H. Y. Huang, F. Y. Huang (Automotive Research & Testing Center, Taiwan)

#### *GS14-4 Autonomous navigation system using geographical feature elements information for navigation mapping system*

I. Zunaïdi, M. Rozailan, MS Samsi (TATi University College, Malaysia)

N. Kato (Mie University, Japan)

### **13:00~14:00 GS4 Chaos & Cognitive science**

**Chair: T. Shimada (Meiji University, Japan)**

#### *GS4-1 Visual attention model involving feature-based inhibition of return*

S. Hotta, S. Oba, S. Ishii (Kyoto University, Japan)

#### *GS4-2 Relation between impression of touch panels' coloration and operation*

M. Sakamoto, H. Suto, M. Sawai (Muroran Institute of Technology, Japan)

GS4-3 *An extension of a duffing oscillator and nonlinear energy harvesting*  
T. Shimada, T. Moriya, H. Uchiyama (Meiji University, Japan)

GS4-4 *Matrix diagonalization in the quantum anisotropic Kepler problem*  
K. Kubo, T. Shimada (Meiji University, Japan)

**14:05~15:35 GS20 Robotics & Application**  
**Chair: S. H. Han (Kyungnam University, Korea))**

GS20-1 *Variable step-size affine projection algorithm based on excess mean square error*  
C.Hee Lee, P.G. Park (Pohang University of Science and Technology, Korea)

GS20-2 *Basic research on new underwater positioning technology based on machine vision*  
B. Fu, W-T. Li, T. Ge, L. Lian, H. Zhang (Shanghai Jiao Tong University, China)

GS20-3 *Basic research on underwater laser ranging and speed-measuring*  
B. Fu, H. Zhang, T. Ge, L. Lian, W-T. Li (Shanghai Jiao Tong University, China)

GS20-4 *Ultrasonic sensor based navigation for a mobile robot using fuzzy logic*  
Nguyen Huu Cong (Kyungnam University, Korea)  
Sung-Hyun Han (Kyungnam University, Korea)

GS20-5 *Robust real-time control of autonomous mobile robot by using ultrasonic and infrared sensors*  
V-Q. Nguyen, S-B. Kyun, S.H. Han (Kyungnam University, Korea)

GS20-6 *Artificial life intelligent contour following industrial robot*  
MS Samsi, I Zunaidi, N Nagarajan, Y Sazali , M Rozailan (TATi University College, Malaysia)

**16:45~17:45 OS3 Learning control and robotics**  
**Chair: H.H. Lee (Waseda University, Japan)**  
**Co-Chair: H. Ogai (Waseda University, Japan)**

OS3-1 *Real time traffic signal learning control using BPNN based on prediction for probabilistic distribution of standing vehicles*  
C. Cui, J.S. Shin, H.H. Lee (Waseda University, Japan)

OS3-2 *Advanced pipe inspection robot using rotating probe*  
K. Nishijima (Waseda University, Japan)  
Y. Sun (Shanghai Jiao Tong University, China)  
H. Ogai (Waseda University, Japan)  
R.K. Srivastava, B. Bhattacharya (Indian Institute of Technology Kanpur, India)

OS3-3 *Quasi-ARX neural network and its application to adaptive control of nonlinear systems*  
J. HU, L. Wang (Waseda University, Japan)

OS3-4 *Real-time generation of developed view for drain pipe based on web camera video*  
Z. Wang, H. Ogai, S. Takeno (Waseda University, Japan)

## **Room C**

**8:40~9:55 GS1 Artificial brain research**

**Chair: M. Obayashi (Yamaguchi University, Japan)**

GS1-1 *Revisited: Hebbian postulate under homeostatic plasticity*

S. Fernando, S. Matsuzaki, Y. Nakamura, A. Marasinghe (Nagaoka University of Technology, Japan)

GS1-2 *Memory capacity and information capacity of the sparsely encoded associative memory with replacing units*

R. Miyata (University of the Ryukyus, Japan)

S. Muta, K. Kurata (University of the Ryukyus, Japan)

GS1-3 *A study on Q-learning considering negative rewards*

T.Fuchida, Kathy T.A, A.Sakuragi (Kagoshima University, Japan)

GS1-4 *Intelligent agent construction using the attentive characteristic patterns of chaotic neural networks*

M.Obayashi, T.Kuremoto, K.Kobayashi (Yamaguchi University, Japan)

GS1-5 *An effective image transmission method in ZigBee System for intruder detection systems*

S.K. Hwang, S.G. Lee (Hannam University, Korea)

**11:05~12:05 GS21 Pattern recognition**

**Chair: K Hashimoto (Osaka Prefecture University, Japan)**

GS21-1 *A color-based particle filter for multiple objects tracking in outdoor environment*

B. Sugandi, H. Kim, J.K. Tan, S. Ishikawa (Kyushu Institute of Technology, Japan)

GS21-2 *A Study of dimension reduction of Gabor features from different facial expressions*

R. Samad, H. Sawada (Faculty of Engineering, Kagawa University, Japan)

GS21-3 *Interactive musical editing system to support human errors and offer personal preferences for an automatic piano*

- *A method for searching for similar phrases using DP matching and for inferring performance expression with the best alignment of DP matching-*

K. Koga, E. Hayashi (Kyusyu Institute of Technology, Japan)

GS21-4 *A Corpora-based detection of stylistic inconsistencies of text in the targeted subgenre*

K Hashimoto (Osaka Prefecture University, Japan)

K. Takeuchi, H. Ando (Osaka Electro-Communication University, Japan)

**13:00 ~14:00 OS13 Intelligent systems**

**Chair: J. Y. Shim (Kangnam University, Korea)**

**Co-Chair: J. J. Lee (KAIST, Korea)**

OS13-1 *Emotion inspired mechanism in the intelligent system*

J.Y. Shim (Kangnam University, Korea)

OS13-2 *Object recognition algorithm using vocabulary tree and pre-matching array*

H.Y. Seo, J.J. Lee (KAIST, Korea)

OS13-3 *Memory association and reaction by conditioning*  
J.Y. Shim (Kangnam University, Korea)

OS13-4 *Application of neuro-fuzzy PID controller for post chlorine process*  
H.H. Lee, C.M. Oh, J.J. Lee (KAIST, Korea)  
A.K. Lee, D.H. Lee (Korea Water Resources Corporation, Korea)

**14:05~15:20 OS18 Intelligent signal processing**

**Chair: Sigeru Omatu (Osaka Prefecture University, Japan)**

**Chair: Mohad Saberi Mohamad (Osaka Prefecture University, Japan)**

OS18-1 *Face image make up system by using  $\varepsilon$ -filter*  
M. Yoshioka, S. Omatu, H. Yanagimoto (Osaka Prefecture University, Japan)

OS18-2 *Image segmentation using probability density estimation*  
K. Imaguma, M. Yoshioka, S. Omatu, H. Yanagimoto (Osaka Prefecture University, Japan)

OS18-3 *Particle swarm optimization with a modified sigmoid function for gene selection from gene expression data*  
M.S. Mohamad, S. Omatu (Osaka Prefecture University, Japan)  
S. Deris (Universiti Teknologi Malaysia, Malaysia)  
M. Yoshioka (Osaka Prefecture University, Japan)

OS18-4 *Selecting informative gene for cancer classification by using particle swarm optimization*  
M.S. Mohamad, S. Omatu (Osaka Prefecture University, Japan)  
S. Deris (Universiti Teknologi Malaysia, Malaysia)  
M. Yoshioka (Osaka Prefecture University, Japan)

OS18-5 *Radon transform for face recognition*  
J. A. Dargham, A. Chekima, E. Mounq (University Malaysia Sabah, Malaysia)  
S. Omatu (Osaka Prefecture University, Japan)

**16:45~17:45 GS10 Image Processing I**

**Chair: T. Matsubara (National Defense Academy, Japan)**

GS10-1 *A dynamically reconfigurable processor for the H.264/AVC image prediction*  
Y. Hayakawa, A. Kanasugi (Tokyo Denki University, Japan)

GS10-2 *X-ray computed tomography using material-class modeling by MRF energy minimization*  
W. Fukuda, S. Maeda, A. Kanemura, S. Ishii (Kyoto University, Japan)

GS10-3 *Implementation of TFT inspection system using the stream processor*  
B.Y. Park, C.H. Lee, P.G. Park (Pohang University of Science and Technology, Korea)

GS10-4 *Study on the crack detection of bridges based on digital image processing*  
J. Wang, G. Zhang, Mingcheng E (Beijing Jiaotong University, China)

## **Room D**

**11:05~12:05 OS11 Robot control**

**Chair: Y-M. Jia (Beihang University, China)**

**Co-Chair: J-P. Du (Beihang University, China)**

OS11-1 *Adaptive image filtering for tracking control of robots*

D. Cao, Y-M. Jia (Beihang University, China)

J-P. Du (Beijing University of Posts and Telecommunications, China )

OS11-2 *Non-fragile control for trajectory tracking of mobile robot systems with time-delay*

N. Ni, Y-M. Jia (Beihang University, China)

J-P. Du (Beijing University of Posts and Telecommunications, China )

OS11-3 *Experimental comparison among three typical data-driven control algorithms*

S. Jin, Y. Li, Y. Zhu, J. Hao, Z. Hou (Beijing Jiaotong University, China)

OS11-4 *Adaptive identification and prediction control for time delay nonlinear systems based on neural networks*

J. Na, X. Ren (Beijing Institute of Technology, China)

**16:45~17:45 OS14 Intelligent robots**

**Chair: J. J. Lee (KAIST, Korea)**

**Co-Chair: Maki .K Habib (The American University in Cairo, Egypt)**

OS14-1 *Behavior based autonomous navigation system for mobile robots*

M.K. Habib (The American University in Cairo, Egypt)

OS14-2 *The optical FBG contact force measurement system for the haptic feedback of minimal invasive surgery robot*

H.S. Song, J.W. Suh, Y.I. Yoo, J.J. Lee (KAIST, Korea)

OS14-3 *Impedance model force control using a neural network-based effective stiffness estimator*

F. Nagata, T. Mizobuchi (Tokyo University of Science Yamaguchi, Japan)

T. Hase, Z. Haga (R&D Center, Meiho Co. Ltd., Japan)

K. Watanabe (Okayama University, Japan)

M K. Habib (The American University in Cairo, Egypt)

OS14-4 *Fuzzy sliding mode control for under-actuated system with mismatched uncertainties*

S.Y. Shin, J.J. Lee (KAIST, Korea)

## **Room E**

**11:05~12:05 PS1 Poster session 1**

PS1-1 *A study of embedded community network system in home automation*

C-L. Chen, P-Y. Chen (Nan Kai University of Technology, Taiwan)

PS1-2 *A novel coding method for genetic algorithms based on redundant binary number*

A. Murayama, A. Kanasugi (Tokyo Denki University, Japan)

PS1-3 *The optimal combination of dither matrix by using genetic algorithm*  
T. Kato, K. Tanaka (Meiji University, Japan)

PS1-4 *Improved algorithm for solving the maximal Clique Problem with DNA computing*  
H. Aoyagi, N. Rajaei, O. Ono (Meiji University, Japan)

### **13:00~14:00 PS2 Poster session 2**

PS2-1 *Difference of 3-back task performance due to three levels of arousal*  
M.H. Choi, J.S. Choi (Konkuk University, Korea)  
B.C. Min (Hanbat National University, Korea)  
G.R. Tack, S.C. Chung (Konkuk University, Korea)

PS2-2 *Detection of human respiration based on measurement system of current generated by electro-static induction*  
K. Kurita (Kochi National College of Technology, Japan)

PS2-3 *Authentication of the reconstructed image from computer-generated hologram: synthesized by complex Hadamard transform*  
F. Inaba, N. Fujii, K. Tanaka (Meiji University, Japan)

PS2-4 *Feature extraction method using laser range finder for SLAM*  
T.R. Kim, S.Y. Jung, J.M. Kim, S.S. Kim (Pusan National University, Korea)

PS2-5 *A case study of discussion classes in mathematics education (Research for the improvement of mathematics education)*  
Hyang Joo Rhee (Duksung Womens University, ,Korea)

## **February 6 (Saturday)**

### **8:00~ Registration**

### **Room A**

#### **8:40~10:10 OS4 Analysis and implementation of nonlinear systems**

**Chair: H. Suzuki (The University of Tokyo, Japan)**

**Co-Chair: T. Kohno (The University of Tokyo, Japan)**

OS4-1 *An Izhikevich type silicon neuron circuit*  
Y. Nagamatsu, K. Aihara, T. Kohno (The University of Tokyo, Japan)

OS4-2 *A digital spiking silicon neural network*  
T. Nakayama, Y. Katori, K. Aihara, T. Kohno (The University of Tokyo, Japan)

OS4-3 *Failure of pseudo-periodic surrogates*  
M. Shiro, Y. Hirata, K. Aihara (The University of Tokyo, Japan)

OS4-4 *Estimation of excess entropy from spike trains*  
H. Motoyoshi, Y. Katori, and H. Suzuki (The University of Tokyo, Japan)

OS4-5 *Synchronized brain activity changes related to perceptual alternations*

K. Iwayama (The University of Tokyo, Hokuriku Innovation Cluster for Health Science, Japan)  
K. Takahashi (The University of Tokyo, JSPS Research Fellow, Japan)  
K. Watanabe (The University of Tokyo, Hokuriku Innovation Cluster for Health Science, Japan)  
Y. Hirata, K. Aihara, H. Suzuki (The University of Tokyo, Japan)

**10:30~11:45 OS24 Real time methods for structural change detection of ongoing time series data**

**Chair: T. Hattori (Kagawa University, Japan)**

**Co-Chair: H. Kawano (NTT Advanced Technology, Japan)**

OS24-1 *Structural change point detection by sequential probability ratio test and Chow test*

T. Hattori, K. Takeda (Kagawa University, Japan)  
T. Izumi (Micro Technica Co.,Ltd, Japan)  
H. Kawano (NTT Advanced Technology, Japan)

OS24-2 *Extended SPRT for structural change detection of time series based on multiple regression model*

T. Hattori, K. Takeda (Kagawa University, Japan)  
T. Izumi (Micro Technica Co.,Ltd, Japan)  
H. Kawano (NTT Advanced Technology, Japan)

OS24-3 *Application of SPRT to image data sequence for remote monitoring system*

K. Takeda, T. Hattori (Kagawa University, Japan)  
T. Izumi (Micro Technica Co.,Ltd, Japan)  
H. Kawano (NTT Advanced Technology, Japan)  
S. Masuda (C Micro Co., Ltd., Japan)

OS24-4 *Early structural change detection as an optimal stopping problem (I)*

*-Formulation using dynamic programming with action cost*

T. Hattori, K. Takeda (Kagawa University, Japan)  
T. Izumi (Micro Technica Co.,Ltd, Japan)  
H. Kawano (NTT Advanced Technology, Japan)

OS24-5 *Early structural change detection as an optimal stopping problem (II)*

*-Solution theorem and its proof using reduction to absurdity*

H. Kawano (NTT Advanced Technology, Japan)  
T. Hattori, K. Takeda (Kagawa University, Japan)  
T. Izumi (Micro Technica Co.,Ltd, Japan)

**12:40~13:40 GS5 Control technique I**

**Chair: M. Oya (Kyushu Institute of Technology, Japan)**

GS5-1 *Lateral control of an UCT(Unmanned Container Transporter) using ultrasonic satellite system and system identification*

H.G. Park, S.M. Yoon 1, K.S. Lee, S.Y. Kim (Pusan National University, Korea)  
M.H. Lee (Pusan National University, Korea)

*GS5-2 Autonomous load-balancing data transmission scheme to multiple sinks for long-term operation of wireless sensor networks*

K. Matsumoto, A. Utani, H. Yamamoto (Tokyo City University, Japan)

*GS5-3 Robust ride comfort control of vehicles without measurements of tire deflection*

K. Okumura (Department of Fukuoka Industrial Technology Center, Japan)

M. Oya (Kyushu Institute of Technology, Japan)

H. Wada (Shin-Nippon Nondestructive Inspection Co., Japan)

*GS5-4 Specification and real-time control of robotic manufacturing systems based on concurrent process modeling*

G. Yasuda (Nagasaki Institute of Applied Science, Japan)

**14:15~16:00 GS16 Neural networks**

**Chair: T. Kondo (Tokushima University, Japan)**

*GS16-1 Learning algorithm of the revised RBF network and its application to the media art system*

C. Kondo (Keio University, Japan)

T. Kondo (Tokushima University, Japan)

*GS16-2 Feedback GMDH-type neural network algorithm and its application to medical image analysis of cancer of the liver*

C. Kondo (Keio University, Japan)

T. Kondo (Tokushima University, Japan)

*GS16-3 Improvement of a neural network based motion generator with bimanual coordination for upper limb prosthesis*

E. Inohira, H. Yokoi (Kyushu Institute of Technology, Japan)

*GS16-4 Midpoint-validation algorithm for support vector machine classification*

H. Tamura, S. Yamashita, K. Tanno (University of Miyazaki, Japan)

*GS16-5 An analog-digital circuit for sound localization based on the biological auditory system*

T. Tomibe, K. Nishio (Tsuyama National College of Technology, Japan)

*GS16-6 Artificial neural networks paddy field classifier using spatiotemporal remote sensing data*

T. Yamaguchi, K. Kishida, E. Nunohiro, J.G. Park, Kenneth J. Mackin, K. Hara,

K. Matsushita, I. Harada (Tokyo University of Information Sciences, Japan)

*GS16-7 Transformation of neural network weight trajectories on 2D plane for learning type neural network direct controller*

T. Yamada (Ibaraki University, Japan)

## **Room B**

### **8:40~10:10 OS23 Bio-inspired theory and application**

**Chair: I. Yoshihara (University of Miyazaki, Japan)**

**Co-Chair: M. Yasunaga (University of Tsukuba, Japan)**

#### *OS23-1 Study upon cooperative optimization problem between two humans by mutual tracking*

Y. Hayashi (Tohoku Institute of Technology, Japan)

Y. Tamura (Tohoku Gakuin University, Japan)

F. Ishida (Toyama National College of Technology, Japan)

K. Sugawara (Tohoku Gakuin University, Japan)

Y. Sawada (Tohoku Institute of Technology, Japan)

#### *OS23-2 A study on the behavior of a few ant workers*

K. Sugawara, M. Yuki (Tohoku Gakuin University, Japan)

Y. Hayashi (Tohoku Institute of Technology, Japan)

T. Kikuchi, K. Tsuji (University of the Ryukyus, Japan)

#### *OS23-3 Estimation of average hitting time in genetic algorithms by Markov chain*

Q-L. Ma, Y-A. Zhang, M. Sakamoto, H. Furutani (University of Miyazaki, Japan)

#### *OS23-4 Quest for genetic information hidden behind disorder in DNA sequences*

Y. Koyama, K. Nishimuta, K. Yamamori, I. Yoshihara (University of Miyazaki, Japan)

M. Yasunaga (University of Tsukuba, Japan)

#### *OS23-5 Development of a novel crossover of hybrid genetic algorithms for large-scale traveling salesman problems*

M. Kuroda, K. Yamamori (University of Miyazaki, Japan)

M. Munetomo (Hokkaido University, Japan)

M. Yasunaga (University of Tsukuba, Japan)

I. Yoshihara (University of Miyazaki, Japan)

#### *OS23-6 Signal integrity improvement method and its robustness evaluation for VLSI and VLSI-packaging*

M. Ishiguro, H. Nakayama, Y. Shimauchi, N. Aibe, Y. Yamaguchi (University of Tsukuba, Japan)

I. Yoshihara (University of Miyazaki, Japan)

M. Yasunaga (University of Tsukuba, Japan)

### **10:30~11:45 OS12 Bio-symphony**

**Chair: K. Naitoh (Waseda University, Japan)**

**Co-Chair: T. Ohira (SONY CSL Inc., Japan)**

#### *OS12-1 Onto-biology: clarifying also spatiotemporal structure*

K. Naitoh (Waseda University, Japan)

#### *OS12-2 Morphogenetic-cycle model: Clarifying several stages of embryo, brain, lung, and heart*

A. Suzuki, K. Naitoh (Waseda University, Japan)

#### *OS12-3 Inner-asymmetry and outer-symmetry underlying life*

K. Ogata, K. Naitoh (Waseda University, Japan)

OS12-4 *Entrainment of a circadian clock in vitro*

H. Ito (Ochanomizu University, Japan)

T. Yoshida, Y. Murayama, M. Nakajima, T. Kondo (Nagoya University, Japan)

OS12-5 *Delay, Noise and Resonance: Human balancing and temporal non-locality*

Toru Ohira (SONY CSL Inc., Japan)

**12:40~13:55 GS15 Multi-agent systems**

**Chair: S.M. Yang (The University of Suwon, Korea)**

GS15-1 *Robots' action control of autonomous decentralized FMS by remorse mind*

H. Yamamoto, K. Ikebuchi, T. Yamada (Gifu University, Japan) **(moved to OS9-7)**

GS15-2 *Improvement of a software estimate efficiency centered PSP practice support system using multiagent techniques*

D. Yamaguchi (Toin University of Yokohama, Japan)

A. Niimi (Future University-Hakodate, Japan)

M. Takahashi (Toin University of Yokohama, Japan)

GS15-3 *A communication protocol based on IR-Space division transceivers for mobile robots*

T. Abe, H. Takai (Hiroshima City University, Japan)

K. Tachibana (Osaka Gakuin University, Japan)

GS15-4 *Intelligent network surveillance system based on ontology*

S.M. Yang (The University of Suwon, Korea)

GS15-5 *A multi-agent-based approach for furniture arrangement*

S. Ono, T. Oshige, S. Nakayama (Kagoshima University, Japan)

**14:15~16:00 GS19 Robotics & Bipedal robot**

**Chair: M. Zhao (Tsinghua University, P. R. China)**

GS19-1 *Design of robotic arm's action to imitate the mechanism of an animal's consciousness*

T. Yamasaki, E. Hayashi (Kyushu Institute of Technology, Japan)

GS19-2 *Development of an autonomous-drive personal robot (Self-position correcting by door recognition)*

S. Matsuura, E. Hayashi (Kyusyu Institute of Technology, Japan)

GS19-3 *A user recognition system using a stemma camera*

S. Tanaka, E. Hayashi (Kyusyu Institute of Technology, Japan)

GS19-4 *Design of robotic behavior that imitates animal consciousness*

- *Development of method for pursuing or escaping from an object -*

K. Kurogi, E. Hayashi (Kyusyu Institute of Technology, Japan)

GS19-5 *Recognition and movement in artificial environment with bipedal robot*

N. Ohtsu, N. Abe, K. Tanaka, Y. Tabuchi (Kyusyu Institute of Technology, Japan)

GS19-6 *Estimation of other's sensor patterns based on motion imitation and communication*  
-- *Identification of symbolization strategy for sensor by comparative evaluation questions* --  
K. Okuno (Sokendai, Japan)  
T. Inamura (NII/Sokendai, Japan)

GS19-7 *A walking gait generation using stance-leg actuation*  
X. Zhang, M. Zhao (Tsinghua University, P. R. China)

## **Room C**

### **8:40~10:10 OS5 Control and automata**

**Chair: M. Kono (University of Miyazaki, Japan)**

**Co-Chair: M. Yokomichi (University of Miyazaki, Japan)**

OS5-1 *Sampled-data models for affine nonlinear systems using a fractional-order hold and their zero dynamics*  
M. Nishi, M. Ishitobi (Kumamoto University, Japan)

OS5-2 *Development of 6-DOF force feedback system with pneumatic parallel mechanism*  
Y. Hitaka (Kitakyushu National College of Technology, Japan)  
Yoshito, Tanaka, Yutaka Tanaka (Hosei University, Japan)  
J. Ishii (Kitakyushu National College of Technology, Japan)

OS5-3 *A study of guaranteed cost control of the manipulator with passive revolute joint*  
J. Hara, N. Takahashi, J. Kato, O. Sato, M. Kono (University of Miyazaki, Japan)

OS5-4 *Analysis of manipulator in consideration of relative motion between tray and object*  
A. Sato (Miyakonojo National College of Technology, Japan)  
O. Sato, N. Takahashi, A. Uekubo, M. Kono (University of Miyazaki, Japan)

OS5-5 *Parallel turing machines on four-dimensional input tapes*  
T. Ito (Ube National College of Technology, Japan)  
M. Sakamoto, A. Taniue, T. Matsukawa (University of Miyazaki, Japan)  
Y. Uchida (Ube National College of Technology, Japan)  
H. Furutani, Y. Ma, M. Kono (University of Miyazaki, Japan)

OS5-6 *Some properties of four-dimensional parallel turning machines*  
Y. Uchida (Ube National College of Technology, Japan)  
M. Sakamoto, A. Taniue, R. Katamune (University of Miyazaki, Japan)  
T. Ito (Ube National College of Technology, Japan)  
H. Furutani, M. Kono (University of Miyazaki, Japan)

### **10:30~11:45 OS10 Biomimetic machine and robots**

**Chair: K. Watanabe (Okayama University, Japan)**

**Co-Chair: K. Izumi (Saga University, Japan)**

OS10-1 *Adaptation of robot perception on fuzzy linguistic information by evaluating vocal cues for controlling a robot manipulator*  
A.G.B.P. Jayasekara (Saga University, Japan)  
K. Watanabe (Okayama University, Japan)  
K. Kiguchi, K. Izumi (Saga University, Japan)

OS10-2 *Stick-slip motion control for an orthogonal-type robot*

F. Nagata, T. Mizobuchi, S. Tani (Tokyo University of Science, Japan)  
T. Hase, Z. Haga (R&D Center, Meiho Co. Ltd., Japan)  
K. Watanabe (Okayama University, Japan)  
M. K. Habib (American University in Cairo, Egypt)

OS10-3 *Modeling an autonomous underwater vehicle with four-thruster*

Zainah Md. Zain, K. Watanabe, T. Danjo (Okayama University, Japan)  
K. Izumi (Saga University, Japan)  
I. Nagai (Okayama University, Japan)

OS10-4 *The number of unscented transformations and the effect of noise estimates in an unscented kalman filtering problem*

Saifudin bin Razali, K. Watanabe, S. Maeyama (Okayama University, Japan)  
K. Izumi (Saga University, Japan)

OS10-5 *Research on movements in formation of multiple mobile robots*

T. Kato, K. Watanabe, S. Maeyama (Okayama University, Japan)

**12:40~13:55 GS17 Robotics I**

**Chair: S. Sagara (Kyushu Institute of Technology, Japan)**

GS17-1 *Development of variable stiffness joint drive module and experimental results of joint angle control*

J. Kobayashi (Kyushu Institute of Technology, Japan)  
K. Okumura, Y. Watanabe (FITC, Japan)  
N. Suzuki (Mitsuwa, Japan)

GS17-2 *Digital RAC with disturbance observer for underwater vehicle-manipulator systems*

S. Sagara, T. Yatoh, T. Shimozaawa (Kyushu Institute of Technology, Japan)

GS17-3 *Development of an autonomous-drive personal robot "An object recognition system using image processing and an LRS"*

Y. Kibe, E. Hayashi (K.I.T., Japan)

GS17-4 *Path planning algorithm using the values clustered by k-means*

W.S. Kang, S.H. Lee, B. Abibullaev, J.W.Kim, J.N. An (DGIST, Korea)

GS17-5 *Homing navigation with image matching approach*

J.W. Lee, D.E. Kim (Yonsei University, Korea)

**14:15~15:45 OS26 Artificial application & Artificial and green technology II**

**Chair: D.H. Kim (Hanbat National University, Korea)**

OS26-1 *Online-based therapeutic services for individuals who are searching for new challenges in life*

J.H. Lim (Daegu cyber university, Korea)  
H.W. Yoon (Gachon university of medicine and science, Korea)

OS26-2 *Multimodal context-awareness system for automated monitoring-control*

S.D. Park, H.K. Chang, B.M. Jang, B.H. Kim, E.J. Choi (Hannam Univ., UBNC Co. Ltd, Korea)

OS26-3 *The design of GHG(Greenhouse Gas) reduction control system*

Y.S. Choi, S.K. Cha, K.J. Cheon, H.C. Kim (Comesta, Inc. Korea)

OS26-4 *Analysis of soil cement characteristics using recycled fine aggregates for landfill*

Y.M. Kim (Hanbat National University, Korea)

OS26-5 *Design of LCL filter for renewable energy sources using bacterial foraging optimization*

D.H. Kim (Hanbat National University, Korea)

J.H. Cho (Chungbuk National University Korea)

OS26-6 *Semantic query processing based on SQL*

H.C. Lee, H.S. Hwang (WonKwang University, Korea)

**Room D**

**8:40~10:10 GS22 Virtual reality**

**Chair: T. Yamada (Gifu University, Japan)**

GS22-1 *Detection of volume data of aortic tissues based on three dimensional domain growing*

T. Tokuyasu, T. Shuto, K. Yufu (Oita National College of Technology, Japan)

N. Abe (Kyushu Institute of Technology, Japan)

S. Kanao, A. Marui (Kyoto University, Japan)

M. Komeda (Nagoya Heart Center, Japan)

GS22-2 *Autonomous walking with use of quadruped virtual robot*

K. Miyoshi, N. Abe, Y. Tabuchi (Kyushu Institute of Technology, Japan)

H. Taki (Wakayama University, Japan)

Shoujie He (VuCOMP, USA)

GS22-3 *Construction of the head model for the operation simulation system targets the brain aneurysm*

T. Miyagi, N. Abe (Kyushu Institute of Technology, Japan)

Y. Kinoshita (Munakata Suikokai General Hospital, Japan)

T. Tokuyasu (Oita National College of Technology, Japan)

H. Taki (Wakayama University, Japan),

Shoujie He(VuCOMP, USA)

GS22-4 *The construction of remote communication system between haptic-devices*

Y. Uchida, N. Abe (Kyushu Institute of Technology, Japan)

Y. Kinoshita (Munakata Suikokai General Hospital, Japan)

H. Taki (Wakayama University, Japan)

T. Tokuyasu (Oita National College of Technology, Japan)

Shoujie He(Vu COMP,USA)

GS22-5 *Construction of virtual dense elastic object from medical image data and deformation with haptic device*

H. Takada, N. Abe (Kyushu Institute of Technology, Japan)

Y. Kinoshita (Munakata Suikokai General Hospital, Japan)

H. Taki (Wakayama University, Japan)

T. Tokuyasu (Oita National College of Technology, Japan),

Shoujie He (VuCOMP, USA)

*GS22-6 Stability analysis of 3D grasps by considering curvatures and torsions of contact geometry*

T. Yamada (Gifu University, Japan)  
T. Taki (Nagoya Institute of Technology)  
M. Yamada (Nagoya Institute of Technology)  
Y. Funahashi (Chukyo University)  
H. Yamamoto (Gifu University)

**10:30~11:45 GS9 Human-machine cooperative systems**

**Chair: A. Nakamura (AIST, Japan)**

*GS9-1 Real time interpolation of haptic information using case base*

T. Toki, H. Taki, H. Miura, N. Matsuda, M. Soga (Wakayama University, Japan)  
N. Abe (Kyushu Institute of Technology, Japan)

*GS9-2 Recovery technique from classified errors in skill-based manipulation*

A. Nakamura, Y. Kawai (AIST, Japan)

*GS9-3 Development of an inheritance assist system for experienced operation skill  
by using a haptic function of PHANTOM*

T. Tokuyasu, K. Yufu, T. Shuto (Oita National College of Technology, Japan)  
N. Abe (Kyushu Institute of Technology, Japan)  
A. Marui (Kyoto University, Japan)

*GS9-4 Automatic detection of pedestrians from stereo camera images*

K. Inumaru, J-K Tan, S. Ishikawa (Kyushu Institute of Technology, Japan)  
T. Morie (Kyushu Institute of Technology)

*GS9-5 Human behavior analysis with optical flow and median-filtered temporal motion segmentation  
method*

Md. Atiqur Rahman Ahad, J.K. Tan, H. Kim, S. Ishikawa (Kyushu Institute of Technology, Japan)

**12:40~13:25 GS6 Control technique II**

**Chair: H. H. Lee (Waseda University)**

*GS6-1 A method using same light sensor for detecting multiple events on window in home intruding  
crime*

A. Yamawaki, T. Katakami, Y. Kitazono, S. Serikawa (Kyushu Institute of Technology, Fukuoka,  
Japan)

*GS6-2 A learning control of unused energy power generation*

S. Shikasho, J.S. Shin, C-Y. Cui, H.H. Lee (Waseda University, Japan)

*GS6-3 Design optimization of switched reluctance motor torque controller in electric vehicles*

Y. Zhu, D. Wang, G. Zhao, D. Yang, M. Xin (Harbin Institute of Technology, China)  
T. Ito (Ube National College of Technology, Japan)

**14:15~15:45 OS6 Computer vision and robotics**

**Chair: Y. Yoshitomi (Kyoto Prefectural University, Japan)**

**Co-Chair: O. Sato (Miyakonojo National College of Technology, Japan)**

OS6-1 *An improvement of MSEPF for visual tracking*

Y. Nakagama , M. Yokomichi (Miyazaki University, Japan)

OS6-2 *A system for synchronizing nodes of a CG character and a human using thermal Image processing and moving average model*

R. Kato, Y. Yoshitomi, T. Asada, M. Tabuse (Kyoto Prefectural University, Japan)

OS6-3 *Quadruped walking with parallel link legs*

T. Yaginuma, E. Shimizu, M. Ito (Tokyo University of Marine Science and Technology, Japan)

J. Tahara (Japan Agency for Marine-Earth Science and Technology, Japan)

T. Takesima (Tokyo University of Marine Science and Technology, Japan)

OS6-4 *Development of under water use humanoid robot*

Y. Li, E. Shimizu, M. Ito (Tokyo University of Marine Science and Technology, Japan)

OS6-5 *Improvement of underwater vehicle remote control environment with parallel link operation base*

K. Inabe, E. Shimizu, M. Ito (Tokyo University of Marine Science and Technology, Japan)

J. Tahara (Japan Agency for Marine-Earth Science and Technology, Japan)

OS6-6 *Spinning control of basketball with robot fingers*

Y. Ohtake, M. Ito, F. Zhang (Tokyo University of Marine Science and Technology, Japan)