

# AROB-ISBC-SWARM 2022

The Twenty-Seventh International Symposium on

## Artificial Life and Robotics

(AROB 27th 2022)

The Seventh International Symposium on

## BioComplexity

(ISBC 7th 2022)

The Fifth International Symposium on

## Swarm Behavior and Bio-Inspired Robotics

(SWARM 5th 2022)

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International Society of Artificial Life and Robotics (ISAROB)

### **CO- ORGANIZED BY**

The Institute of Electronics, Information and Communication Engineers (IEICE, Japan)

### **CO-OPERATED BY**

The Society of Instrument and Control Engineers (SICE, Japan)  
The Robotics Society of Japan (RSJ, Japan)  
The Institute of Electrical Engineers of Japan (IEEEJ, Japan)  
The Institute of Systems, Control and Information Engineers (ISCIE, Japan)  
IEEE Robotics and Automation Society Japan Chapter  
Japan Association for Omics-based Medicine (JSOM, Japan)  
Japan Society for Simulation Technology (JSST, Japan)

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ONLINE, January 25-27, 2022

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## HISTORY

The AROB symposium was founded in 1996 under the support of Science and International Affairs Bureau, Ministry of Education, Culture, Sports, Science and Technology, Japanese Government. Since then, the symposium organized by the AROB has been held every year at B-Con Plaza, Beppu, Japan except AROB 5th '00 (Oita), AROB 6th '01 (Tokyo) and AROB 18th '13 (Daejeon, Korea). The twenty-seventh symposium will be held on January 25–27, 2022, ONLINE.

## OBJECTIVE

This symposium will bring together researchers to discuss development of new technologies concerning *artificial life and robotics* based on computer simulations and hardware designs of state-of-the-art technologies, and to share findings on how advancements in artificial life and robotics technologies that relate to artificial intelligence, virtual reality, and computer science are creating the basis for exciting new research and applications in various fields.

## COPYRIGHTS

Accepted papers will be published in the proceeding of AROB-ISBC-SWARM2022 and some of high quality papers in the proceeding will be requested to re-submit their papers for the consideration of publication in an international journal ARTIFICIAL LIFE AND ROBOTICS. All correspondence related to the symposium should be addressed to AROB Secretariat.

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### AROB Secretariat

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## GENERAL SESSION TOPICS

Agent-based modelling	Artificial intelligence
Artificial life	Bioinformatics and Medical informatics
Bio-inspired robotics	Bio-mimetics and Brain science
Cognitive science	Control techniques
Evolutionary computations (Genetic algorithm)	
Human-machine interaction and collaboration	Identification and Estimation
Intelligent control	Machine Learning
Mobile robots	Motion planning and navigation
Multi-agent systems	Neural networks
Neurocomputing technologies and its application for hardware	
Parallel and distributed computing	Robot vision and image processing
Robotic Mechanism	Self-organization
Sensor and multi-sensor data fusion	Swarm intelligence
Swarm robotics	

## ORGANIZED SESSION TOPICS

AROB: Advanced Applications of Machine Learning  
AROB: Advanced Technology in Rescue Robot Competition  
AROB: AI in Life Sciences  
AROB: Autonomous Driving system and Control  
AROB: Bio-inspired theory and applications  
AROB: Biomimetic Machines and Robots  
AROB: Brain Theory from ALIFE  
AROB: Computational intelligence and cognitive science for human biosignals and human well-being  
AROB: Control System Security and Encrypted Control  
AROB: Human-Centered Robotics  
AROB: Intuitive Human-System Interaction  
AROB: Learning and Control  
AROB: Robotics with Intelligence and/or Informatics  
AROB: Robotics: Technologies and Intelligence  
AROB: System Sensing and Its Applications  
AROB: Vehicle Control  
AROB: vision and robot control  
ISBC: Chemical and biochemical complexity  
ISBC: Complexity underlying flows  
ISBC: Human and virtual systems  
ISBC: Human system  
ISBC: Mathematics and physics of biological and abiological systems  
ISBC: Medication based on big data and AI  
SWARM: Behavioral measurement and modeling technology to consider individual cognitive functions of organisms  
SWARM: Collective Intelligence in Living/Non-Living agents  
SWARM: Control for Open Swarm Intelligence  
SWARM: e-ASIA Joint Research Project: Informational system for management of flood and landslide disaster areas using a distributed heterogeneous robotic team  
SWARM: Heterogeneity in Collective Systems  
SWARM: Motion Analysis and Control of Advanced Robotic Systems  
SWARM: Snake Robots  
SWARM: Swarm and Bio-inspired Systems