MESSAGES

Hiroshi Tanaka

General Chair

Professor Emeritus, Tokyo Medical and Dental University
Specially appointed professor, Tohoku University

It is my great pleasure and honor to welcome you all to the Twenty-fourth International Symposium on Artificial Life and Robotics (AROB 24th 2019). This year we have also organized a sister symposium on bio-complex systems study, named “The Fourth International Symposium on BioComplexity, (ISBC4)”. By organizing the joint symposium of AROB and ISBC, we could broaden the scope of this symposium to cover the fields of complex systems dealing with anything, related to and inspired by life.

As is needless to say, Alife together with bio-complex systems and biologically-inspired Robotics now attracts wide interests as a new paradigm of science and engineering. For example, the bio-complex systems theory and methodology is now increasing its importance in entering upon the healthcare “Big Data Era”, as a promising approach to promote “cutting-edge medicine”, such as to reveal and conquer the cancer progression mechanism or to explore the efficient reprogramming method of cells/tissues in regeneration medicine (iPS cells). Furthermore, study of “synthetic biology” is now developed in the attempt to synthesize life in wetware or re-design existing, natural biological systems (bacteria) for useful purposes.

Also in the biologically-inspired robotics field, rapid progresses in various types of robot systems have been remarkable such as bipedal humanoid, multi-agent robots. Also in the real world, nursing care robot is gradually being in practice. Furthermore, in wider sense, “molecular robots”, small DNA-based device which identifies receptors in cell surface and targets the cells causing diseases is expected to achieve drug-like function within human body. These examples show the Alife and biologically-inspired Robotics approach are exerting a wide influence on the development of a new paradigm for next generation of science and engineering

In recent years, especially Artificial Intelligence (AI) has attracted an enthusiastic interest again from all branches of society, due to the extraordinary capability of “Deep Learning”, from the very high performance of image understanding to the splendid competence of playing complex game like GO to win the world champion. In our fields of AROB, the impact of AI is outstanding and would revolute the total landscape of our discipline. These trends could be seen already in this year’s symposium

In organizing this year AROB symposium, we are in debt to many Japanese academic associations such as SICE, RSJ, IEEJ, IEICE, ISCIE, JSST and JSOM. I would like to express my sincere thanks to all of those who make this symposium possible.

We hope this symposium becomes a forum for exchange of the ideas of the attendants from various fields, who are interested in the future possibility of Alife, biocomplexy and biologically-inspired Robotics approach. I am looking forward to meeting you in Beppu, Oita.

Hee-hyol Lee

Program Chair

Professor, Waseda University

On behalf of the program committee, it is my great pleasure and honor to invite all of you to the Twenty-Fourth International Symposium on Artificial Life and Robotics (ISAROB 24th 2019) and the Fourth International Symposium on Bio-Complexity (ISBC 4th 2019). The ISAROB was started in 1996 at B-Con Plaza, Beppu, Japan, to develop new frontier of artificial life, robotics, complexity, medicine, and their related fields. The ISBC was started three years ago to find new science and technologies concerning biomedicine and biophysics based on theories, computer simulations, wetware's, and hardware designs.

The ISAROB 24th and ISBC 4th 2019 consist of 3 plenary speeches, 18 organizing sessions, 25 general sessions, 1 poster session, and then a total of 243 papers are published. The brilliant papers presented in these symposiums are able to submit to the international journal - AROB. All papers submitted to the journal go through a double-blind peer-review process. In addition, the quality of our journal depends heavily on support from referees. Thanks for all of referees of our journal.

We are now the greatest revolution of the century for automobile society-a robot car. The robot car, also known as a self-driving car, autonomous car, or driverless car, is a vehicle that is capable of sensing its environment and navigating without human input. The robot cars achieve benefits increased safe, increased customer satisfaction, and reduced accident. On the realization of robot cars, ethical and moral reasoning come into consideration when programming the decision-making by AI (artificial intelligence) that decides what action the robot car takes in an unavoidable crash: trolley problem-a thought experiment of ethics.

A technological singularity, on the other hand, attracts rising attention. The technological singularity is a hypothesis that an upgradable AGI (artificial general intelligence) would enter a runaway reaction of self-improvement cycles causing an intelligence explosion and resulting in a powerful superintelligence, which would far surpass all of our human intelligence. A lot of people capture this prediction positively. However, some people are thinking the technological singularity is dangerous to our humanity and has to avoid, and then an ideal technological singularity for our humanity is seeking now. We hope high-spirited discussion.

We are wishing continued outstanding success of our symposiums.

I am going to look forward to our meeting with all of you again.