MESSAGES

Hiroshi Tanaka

General Chair

Professor Emeritus, Tokyo Medical and Dental University

It is my great pleasure and honor to welcome you all to the AROB-ISBC-SWARM2023, a joint symposium of the 28th International Symposium on Artificial Life and Robotics (AROB2023), the 8th International Symposium on Bio-Complexity (ISBC2023), and the 6th International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2023). By organizing the joint symposium of AROB, ISBC and SWARM, we could broaden the scope of this symposium to cover all the fields of complex systems dealing with anything, related to and inspired by life.

As is, 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 on entering upon the healthcare in “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, in the era of Big Data in medicine and healthcare, artificial intelligence (AI) is expected to play an important role to analyze and interpret the innovative knowledge that the medical big data contains. 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 time series analysis of continuous signals and powerful supports in drug discovery. In our fields of AROB, the impact of AI is outstanding and would revolutionize the total landscape of our discipline.

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 and so forth. Also in the real world, nursing care robot is gradually being in practice. Furthermore, in wider sense, “molecular robots”, small DNA-based devices which identify receptors in cell surface and target 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

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, IEEE Robotics and Automation Society Japan Chapter, 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, biocomplexity and biologically inspired Robotics approach. I am looking forward to meeting you.

Welcome Message

Welcome to AROB/ISBC/SWARM2023; a joint symposium of the 28th International Symposium on Artificial Life and Robotics (AROB2023), the 8th International Symposium on Bio-Complexity (ISBC2023), and the 6th International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2023). Due to the COVID-19 pandemic in Japan, we should consider the risk of meeting in person and this symposium was held online for these three years. In 2023, this symposium is held as a hybrid style in Beppu, Japan.

In this AROB/ISBC/SWARM2023, we have 316 general presentations in 35 general and 24 organized sessions from 10 countries. We are honored to have three plenary talks by Prof. Josh Bongard (The University of Vermont, USA), Prof. Hyungbo Shim (Seoul National University, Republic of Korea), and Prof. Hirotaka Osawa (Keio University, Japan), and three invited talks by Prof. Kiyota Hashimoto (Prince of Songkla University, Thailand), Prof. Zonghe Chua (Case Western Reserve University, USA) and Prof. Mohan Rajesh Elara (Singapore University of Technology, and Design, Singapore). This symposium shall provide the best possible opportunity to all the participants for the exchange of research ideas and information related to artificial life, robotics, control, AI, bio-complexity, swarm behavior, etc.

We would like to sincerely thank our speakers for the plenaries and invited talks, and session organizers. We especially thank the authors and attendees for their valuable contributions and participation. We are also grateful to the advisory, organizing, executive and program committee members, AROB office, and the persons, who generously contributed their precious time and effort in preparing and organizing this symposium.

We sincerely hope that you will be fully satisfied with AROB/ISBC/SWARM2023, and hope that you and your families, and your colleagues remain safe and in good health through these challenging times.

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