

ADDRESS



Sadayoshi Suga
Bunri Gakuen Educational Foundation
Nippon Bunri University
Chairman/Chancellor

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Sadayoshi Suga
Bunri Gakuen Educational Foundation
Nippon Bunri University
Chairman/Chancellor

It is my great pleasure to welcome you all to The Fourteenth International Symposium on Artificial Life and Robotics. I would like to offer my sincere thanks and respect to the many people who have helped make this yearly event possible.

Last year, Nippon Bunri University invited Professor Sugisaka to lead the symposium's team, and with his help we have undertaken this new venture.

As well as being a great venue to meet specialists in many fields, I also feel it's an important platform for presenting research and giving Universities the opportunity to support such research.

As Chairman of this University, I feel great pleasure in working with such outstanding educators who have, on so many occasions, presented their research to the world.

It's my sincere wish that advances in Artificial Life and Robotics Research, in cooperation with the Medical Sciences, Information Systems and other technological fields will lead to improvements in all of our lives.

During your stay here in Beppu, please take time to enjoy the beautiful scenery, relaxing hot springs, and healthy Japanese cuisine that Oita Prefecture has to offer. It's my heartfelt hope that when you leave here, you do so with fresh enthusiasm and motivation.

MESSAGES



Fumio Harashima
Advisory Committee Chairman
(Professor, Tokyo Denki
University)

Fumio Harashima
Advisory Committee Chairman of AROB

The science and technology (S&T) on Artificial Life and Robotics was born in 1996, and it's been providing human being with happiness. This S & T is not only important but also necessary for people living in the world to maintain high quality of life. Research is heart and desire of human being and the S&T is going toward clarifying tool to achieve our objective.

I would like to congratulate researchers who work in the fields on Artificial Life and Robotics.



Masanori Sugisaka
General Chairman
(Professor, Nippon Bunri
University, Japan
Visiting Professor, Waseda
University, Japan)

Masanori Sugisaka
General Chairman of AROB

It is my great honor to invite you all to the Fourteenth International Symposium on Artificial Life and Robotics (AROB 14th '09).

The symposium from the first (1996) to the Thirteenth (2008) were organized by Oita University under the sponsorship of the Science and Technology Policy Bureau, the Ministry of Education, Science, Sports, and Culture (Monbusho), presently, the Ministry of Education, Culture, Sports, Science, and Technology (Monkasho), Japanese Government, Japan Society for the Promotion of Science (JSPS), The Commemorative Organization for the Japan World Exposition ('70), Air Force Office of Scientific Research, Asian Office of Aerospace Research and Development (AFOSR/AOARD), USA.

This symposium is organized by Nippon Bunri University under the sponsorship of JSPS and is co-operated by the Santa Fe Institute (USA), RSJ, IEEJ, ICASE (Now ICROS) (Korea), CAAI (P. R. China), ISCIE, IEICE, IEEE (Japan Council), JARA, and SICE.

The AROB symposium has grown up by the supports from many people who attended the former AROB symposiums. Now, the age of the AROB Symposium became 14 years old since it was born in 1996. The AROB symposium is growing up by absorbing many new knowledge and technologies into it. The future of the AROB symposium is brilliant from a point of view of yielding new technologies to human society in 21st century.

I would like to express my sincere thanks to not only Monkasho, JSPS, the Commemorative Organization for the Japan World Exposition ('70) but also Japanese companies for their repeated support.

This Fourteenth symposium is sponsored by both JSPS and Japanese companies (Mitsubishi Electric Corporation Advanced Technology R&D Center, Oita Gas Co., Ltd., ME System Co., Ltd., Sanwa Shurui Co., Ltd.). I would like to express special thanks to companies stated above.

The symposium invites you to discuss developments and applications of new technologies in the 21st century concerning Artificial Life and Robotics, based on software and hardware.

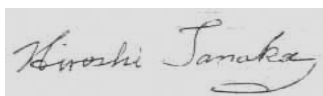
I hope that fruitful discussions between researchers who have different specific ideas will yield new merged technologies and, hence, AROB 14th '09 will facilitate the establishment of an international joint research institute on Artificial Life and Robotics in future.

I hope that you will obtain fruitful results from exchange of ideas between researchers during the symposium.

Hiroshi Tanaka
Program Chairman of AROB



Hiroshi Tanaka
Program Chairman
(Professor, Tokyo Medical
and Dental University)



On behalf of the program committee, it is my great pleasure and honor to invite you all to the Fourteenth International Symposium on Artificial Life and Robotics (AROB 14th '09). This symposium is made possible owing to the cooperation of Nippon Bunri University and Santa Fe Institute. We are also debt to Japanese academic associations such as SICE, RSJ, and several private companies. I would like to express my sincere thanks to all of those who make this symposium possible.

As is needless to say, the Alife or biologically-inspired Robotics approach now attracts wide interests as a new paradigm of science and engineering. Taking an example in the field of bioscience, the accomplishment of HGP (Human Genome Project) and subsequent post-genomic comprehensive "Omics data" such as transcriptome, proteome and metabolome, bring about vast amount of bio-information. However, as a plenty of omics data becomes available, it becomes sincerely recognized that the framework by which these omics data can be understood to make a whole picture of life is critically necessary. Thus, in the post-genomic era, biologically-inspired systems approach like Alife is expected to give one of new alternative ideas to integrate this vast amount of bio-data.

This example shows the Alife approach is very promising and may exert a wide influence on the effort to develop a new paradigm for next generation of life science. We hope this symposium becomes a forum for exchange of the ideas of the attendants from various fields, including the life science field, who are interested in the future possibility of biologically-inspired computation and systems approach.

I am looking forward to meeting you in Beppu, Oita.



Ju-Jang Lee
Vice Chairman
(Professor, KAIST)

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Ju-Jang Lee
Vice Chairman of AROB

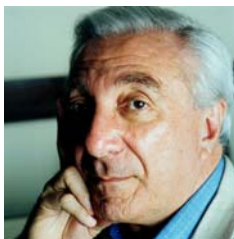
The Fourteenth International Symposium on Artificial Life and Robotics (AROB) will be held in Beppu, Oita, Japan from Feb. 5th to 7th, 2009. This year's Symposium will be held amidst the high expectation of the increasingly important role of the new interdisciplinary paradigm of science and engineering represented by the field of artificial life and robotics that continuously attracts wide interests among scientist, researchers, and engineers around the globe.

Since the time of the very first AROB meeting in 1996, each year, distinguished researchers and technologists from around the world are looking forward to attending and meeting at AROB. AROB is becoming the annual excellent forum that represents a unique opportunity for the academic and industrial communities to meet and assess the latest developments in this fast growing artificial life and robotics field. AROB enables them to address new challenges, share solutions, discuss research directions for the future, exchange views and ideas, view the results of applied research, present and discuss the latest development of new technologies and relevant applications.

In addition, AROB offers the opportunity of hearing the opinions of well known leading experts in the field through the keynote sessions, provides the bases for regional and international collaborative research, and enables to foresee the future evolution of new scientific paradigms and theories contributed by the field of artificial life and robotics and associated research area. The twenty-first century will become the century of artificial life and intelligent machines in support of humankind and AROB is contributing through wide technical topics of interest that support this direction.

It is a great for me as the Vice Chairman of the 14th AROB 2009 to welcome everyone to this important event. Also, I would like to extend my special thanks to all authors and speakers for contributing their research works, the participants, and the organizing team of the 14th AROB.

Looking forward to meeting you at the 14th AROB in Beppu-Oita and wishing you all the best.



J. Casti
Vice Chairman
(Professor, International
Institute for Applied Systems
Analysis and The Kenos Circle)

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John Casti
Vice Chairman of AROB

Since its inception, the AROB has become the most important meeting in Asia each year for the fields of artificial life and robotics. Many of the significant advances in these areas have first been announced at the AROB, including robot football (the MIROSOT). So as a member of the Scientific Committee of this meeting since it began, it is my great pleasure to wish Professor Sugisaka and all participants another successful event in this long sequence of informative meetings in the lovely surroundings of Beppu.



Y. G. Zhang
Vice Chairman
(Professor, Academia Sinica)

Yongguang Zhang

Y. G. Zhang
Vice Chairman of AROB

Dear all friends and all participants,

Here I would like to show my warm welcome to you all attending the Fourteenth International Symposium on Artificial Life and Robotics (AROB '09). As you know, this annual symposium was founded in 1996 by the support of Science and International Affairs Bureau, Ministry of Education, Science, Sports, and Culture (currently, Ministry of Education, Culture, Sports, Science and Technology) of Japan. Since then AROB is gradually become worldwide famous international symposium. Now AROB is already not an “academic baby”, but “academic teenage”, and AROB also owns an international journal, named the “Journal of Artificial Life and Robotics” published by Springer in decade.

The objective of AROB is aimed to develop new technologies for Artificial Life and Robotics which have been born recently. The important devotion of AROB is not only to pay attention to the development of theory on Artificial Life, but also expected to apply the principle to various fields, especially, the combination of both the Artificial Life and Robotics together. So far there are only few international symposiums or conference on artificial life, however, AROB is the only one that to explore the new generation of Robotics in far-sight with artificial life principle. In fact, some intelligent toys and intelligent systems have already been developed, although they have not completed knowledge construction and no evolution. Obviously, this is a very great and difficult career, and need continuous and consistent efforts of more and more scientists and engineers. In recent years, to our pleasure, many young professors and researchers join our team and bring significant outcomes of their work focusing on intelligent robots that we believe applies to the concepts of artificial life and artificial brain. We'd like to welcome and encourage more challenges like these for we are also devoting to the same target.

Beppu, the place of held most AROB symposium, is very charming city in Japan, she has variety of hot spring (jigoku), beautiful bay and colorful mountains. Her phantasmagoric visual change in various season attract many tourists. I hope all of you enjoy and appreciate her.

Finally, I would like to show my great thanks to all people who are working for this AROB '09, including all staffs of AROB Lab, secretariat, and students, the successful holding of AROB symposium is dependent on the contributions of you all.