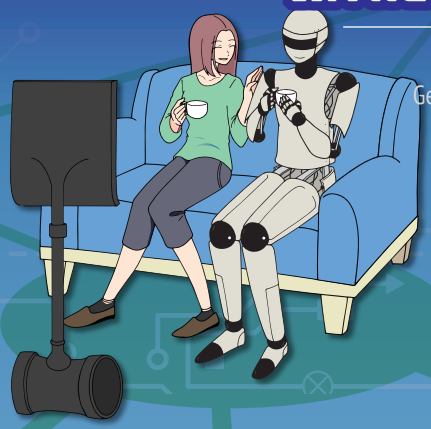
大阪大学 共生知能システム研究センター 第３回国際シンポジウム

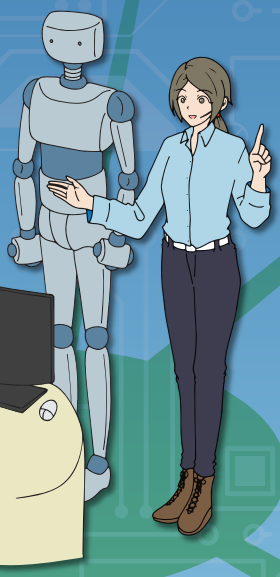
The 3rd International Symposium on

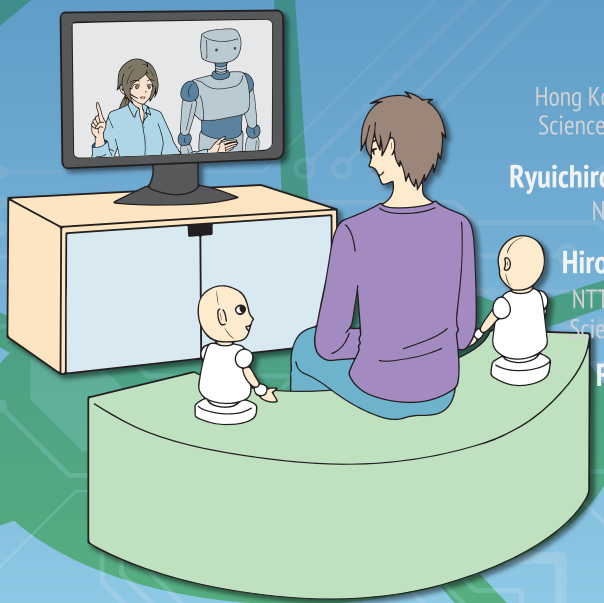
Symbiotic Intelligent Systems

A New Era towards Responsible Robotics and Innovation

Abstracts







DATE

November 19 - 20
2020

VENUE

Virtual Symposium
on Zoom

Invited Speakers

Ronald C. Arkin
Georgia Institute of Technology

Atsuo Kishimoto
Osaka University

Hiroko Kamide
Nagoya University

Satoshi Kurihara
Keio University

Verena V. Hafner
Humboldt University of Belin

Tatsuya Kawahara
Kyoto University

Pascale Fung
Hong Kong University of
Science and Technology

Ryuichiro Higashinaka
Nagoya University

Hiroaki Sugiyama
NTT Communication
Science Laboratories

Fumio Shimpo
Keio University

Session 1 Responsible Robotics and Innovation

Civilized Collaboration: Ethical architectures for enforcing legal requirements and mediating social norms in HRI

Ronald C. Arkin
College of Computing, Georgia Institute of Technology

The ways in which we treat each other, typically underpinned by an ethical theory, serve as a foundation for civilized activity. Bounds and requirements are established for normal and acceptable interactions between humans. If we are to create robotic systems to reside among us, they must also adhere to a set of related values that humans operate under. This talk first describes the importance of such conventions in human-robot interaction, then outlines a way forward including the difficult research questions remaining to be confronted in ethical human robot interaction (HRI). In particular, examples involving architectures using ethical governors, moral emotions, responsibility advisors and theories of mind are described in two quite different contexts: warfare and the maintenance of human dignity in healthcare. Even the role of deception must be considered as an important adjunct to HRI, as it may yield more effective intentional and autonomous social robots if properly deployed. Finally, time permitting, we can consider how robots may eventually be able to engineer more socially just human beings via nudging and the ethical questions associated with using such devices.

Towards responsible innovation: Establishment of the "ELSI Center" at Osaka University

Atsuo Kishimoto
Institute for Datability Science, Osaka University

The concept of ELSI, which was born in the United States 30 years ago, is now reviving in Japan. At the center is not life science but data business and AI. Meanwhile, The Research Center on Ethical, Legal and Social Issues ("ELSI Center") was opened at the Osaka University in Osaka, Japan in April 2020. In this talk, we will introduce the aims and activities of the "ELSI Center." I would like to mention the historical context and the relationship with Responsible Research and Innovation (RRI) in Europe.

Session 3 Symbiotic Cognitive Systems

Psychological evaluation of a sense of security on robots

Hiroko Kamide
Institute of Innovation for Future Society, Nagoya University

A psychological assessment of the sense of security for humanoids will be presented. We investigated the subjective factors for Japanese people that contribute to the sense of security of various humanoids and developed a method to evaluate the sense of security of humanoids based on these factors. We also compared the subjective evaluation of the sense of security of robots between Japanese and Americans. Finally we discuss the conditions for constructing the sense of security for robots.

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Emergent approach for symbiotic framework in creative work

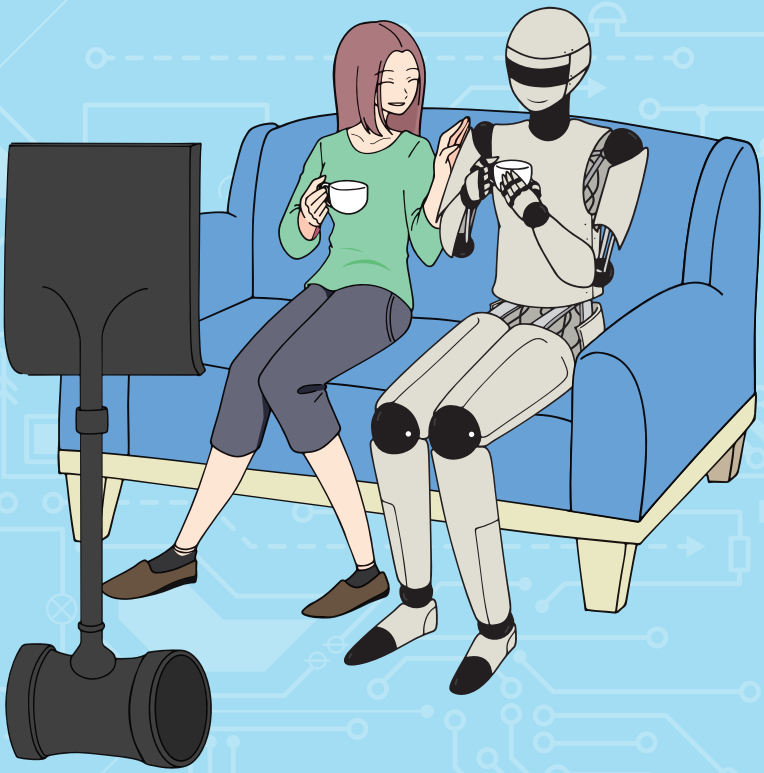
Satoshi Kurihara
Faculty of Science and Technology, Keio University

Purpose of today's use of AI is mainly for efficiency and reducing waste. But. it's important to note that efficiency in itself does not create anything. To the contrary, diverse perspectives (intuition), creativity, adaptability, and resourcefulness are our human unique abilities. Symbiosis with human is next step of AI evolution. In this presentation, I would like to talk about our trial of AI support for human creativity. Key point is how to construct emergent framework for urging creativity.

Robots with a self

Verena V. Hafner
Faculty of Mathematics and Natural Sciences, Humboldt University of Berlin

Studying the prerequisites for an artificial self can give insights into processes of self-construction in humans, as well as into principles of learning and development in robotics, and allow for a more intuitive human-robot interaction. In this talk, I will discuss the prerequisites for developing an artificial minimal self, namely a sense of agency and a sense of body ownership. This will be demonstrated with computational models of sensorimotor prediction and robotics experiments. In particular, internal simulations that predict the consequences of own and others' actions might play an important role in the development of a sense of agency and self-other distinction.



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Session 4 Conversational AI

Spoken dialogue system (SDS) for conversational android ERICA

Tatsuya Kawahara
Graduate School of Informatics, Kyoto University

Following the success of spoken dialogue systems (SDS) in smartphone assistants and smart speakers, a number of communicative robots are developed and commercialized. Compared with the conventional SDSs designed as a human-machine interface, interaction with robots is expected to be in a closer manner to talking to a human because of the anthropomorphism and physical presence. The goal or task of dialogue may not be information retrieval, but the conversation itself. In order to realize human-level "long and deep" conversation, we have developed an intelligent conversational android ERICA. We set up several social interaction tasks for ERICA, including attentive listening, job interview and speed dating.

Deeper conversational AI

Pascale Fung
Deaprtment of Electronic and Computer Engineering, The Hong Kong University of Science and Technology

Conversational AI systems interact with human users while completing user requests or simply chit-chat. These systems have applications ranging from personal assistance, health assistance to customer services, etc. In this talk, I will introduce the current state-of-the-art generation-based conversational AI approaches that leverage large pre-trained language models. I will discuss the challenges and shortcomings of these models such as the lack of knowledge, consistency, empathy, etc. I will highlight our current work in improving the depth of generation-based ConvAI, and possible directions for future research. I will also discuss potential ethical challenges of conversational AI systems and current efforts to address them.

Session 6 Models and Rules of Communication

Integrating understanding and generation modules for adaptive dialogue systems

Ryuichiro Higashinaka
Graduate School of Informatics, Nagoya University

Although dialogue technologies have advanced greatly in the last decades, it is still difficult for human users to achieve tasks appropriately with dialogue systems. We consider that this is due to the system's inability to adapt to users and situations. We are tackling this problem by integrating understanding and generation modules for improving adaptiveness. We report on our data collection to examine how humans adapt their behavior depending on their conversational partners and situations, the dialogue robot competition we organize for tackling the problem with the dialogue systems community, and some preliminary results.

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Building and utilizing "personalities" for communicative intelligent

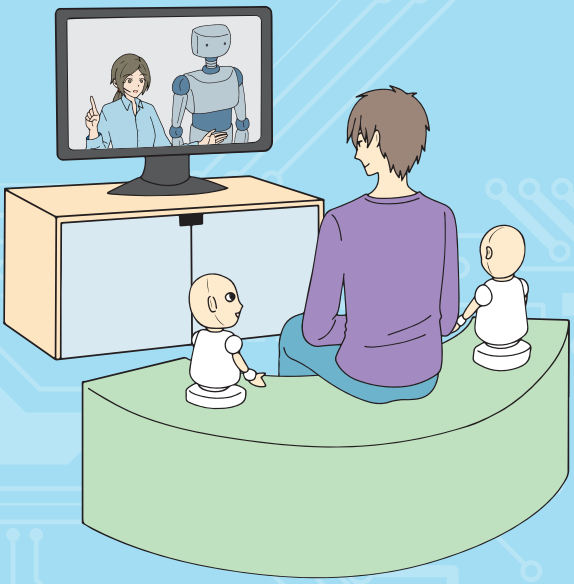
Hiroaki Sugiyama
Innovative Communication Laboratory, NTT Communication Science Laboratories

Communicative intelligent systems that co-exist with humans for a long time necessarily generate consistent utterances based on their personalities. This consistency is ground to build a relationship between humans and systems. However, if a system has a single and fixed personality, it cannot continuously satisfy human wants to communicate with others. Co-existing communicative systems are also required to change their personalities and behaviors through interaction. Such systems are also necessary to consider human personalities and their social relationship when deciding their behaviors (utterances). This talk introduces our behavioral decision model estimation research group's research on how to build and utilize the system and human personalities.

The principal Japanese AI and robot strategy — Significance and legal implications

Fumio Shimpo
Faculty of Policy Management, Keio University

This presentation will focus on the recent Japanese AI and robot strategy and related legal rules and introducing the research activities of 'The Human-Machine Social Norms (HMSN) Research Group' at the communicative intelligent systems towards a human-machine symbiotic society research project. In the future, autonomous robots equipped with artificial intelligence (AI) will become more widespread in our society. These emerging technologies are driving the consideration of not only improvements in the development of their industrial use, but also further research into the ethical and legal issues. For example, robot acquisition of data may lead to data confidentiality issues which we are not able to solve by focusing solely on AI data acquisition issues. The HMSN research group is conducting research on establishing new social norms necessary for a society where humans and machines coexist. This research group will try to establish fundamentally new measures to meet the situations that will arise from the social implementation of communicative robots and provide new knowledge of the ethical and social systems which will be essential for the social acceptance of communicative robots. Moreover, this group aims to focus on research regarding a 'robot law' that summarizes the principles of the social norms which constitute the basis of those measures and knowledge.



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