ALife as a Tool for Cooperative Society Between People and Machines

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Abstract

While technology has brought immeasurable benefits to humankind, recent advances in artificial intelligence and autonomous systems have also led to new ethical, legal, and social issues. We now face the problem of creating a cooperative society in which autonomous systems and people can coexist. The concept of artificial life provides unique perspectives, tools, and philosophies for furthering our understanding of complex living, lifelike, or hybrid systems. However, artificial life is still difficult to comprehend for those outside the academic community. We thus created a public co-creation community called ALIFE Lab, which aims to increase awareness of artificial life in collaboration with artificial life researchers and talents from creative fields such as design, art, and fashion. As one of the community activities, we organized a workshop-based program in which participants learned about Artificial Life and used it as a tool to conceive autonomous systems with concrete vocabulary and theory. This paper reports the methodology and outcomes of the workshop.

Introduction

Today's society has become complex and automated. From aircraft, subways, and busses, to smart phones and all kinds of goods and services, automated systems exist thanks to advances in technology, including artificial intelligence. One of the key technologies to the upcoming post-artificial intelligence age is to develop ways to deal with this new complexity and the resulting ethical, legal, and social issues. While technology has brought many benefits, emergence of complex and automated systems has also generated anxiety and fear. We are faced with the problem of creating a cooperative society in which complex and automated or autonomous systems and people can coexist.

Several organizations have been founded to raise and discuss such social issues around the world, such as Future of Life Institute, [1] Partnership on AI, [2] Future of Humanity Institute,[3] Leverhulme Center for the Future of Intelligence,[4] and the Human Information Technology Ecosystem,[5]among others. In accordance with these movements, we propose using artificial life as a tool for discussing such imminent social issues as it provides unique perspectives, tools, and philosophies that can offer approaches to understanding complex living, lifelike, or hybrid systems (Penn, 2018).

The basis for our activity is a community called ALIFE Lab,[6] which was launched in July 2016 primarily by the authors of this paper to promote co-creation and collaboration between artificial life researchers and practitioners other creative fields, such as art, design, music, fashion, etc. ALIFE Lab aims to incorporate a more diversified viewpoint in answering the ultimate question "What is life?", develop applicable technologies, and contribute to society. Specifically, we organize collaborative workshops and symposia that involve creators such as designers, artists, and engineers. The essential question we pose to the community is how individuals and societies can build more fundamental relationships with new life-like intelligence that is emerging. Through learning about and discussing artificial life, we explore protocols and technologies for connecting with essentially heterogeneous entities that are different from human intelligence. Below, we provide an overview of our approach and report on the outcomes of the conducted workshop.

Artificial Life Workshop

Theme and Design

The underlying theme of the workshop is artificial life. More specifically, we lecture participants on the perspectives, philosophies, and technologies surrounding artificial life and ask them to imagine possible futures. Artificial life is used as a means of speculating about how life could be formulated in a near future, "what if" questions are posed that are intended to open debate and discussion. For example, the concept of autonomy is introduced using the autonomous vacuum cleaner Roomba as an application of artificial life in

1 https://futureoflife.org/
2 https://www.partnershiponai.org/
3 https://www.fhi.ox.ac.uk/
4 http://lcfi.ac.uk/
5 https://ristex.jst.go.jp/hite/en/
6 ALIFE Lab. http://alifelab.org/

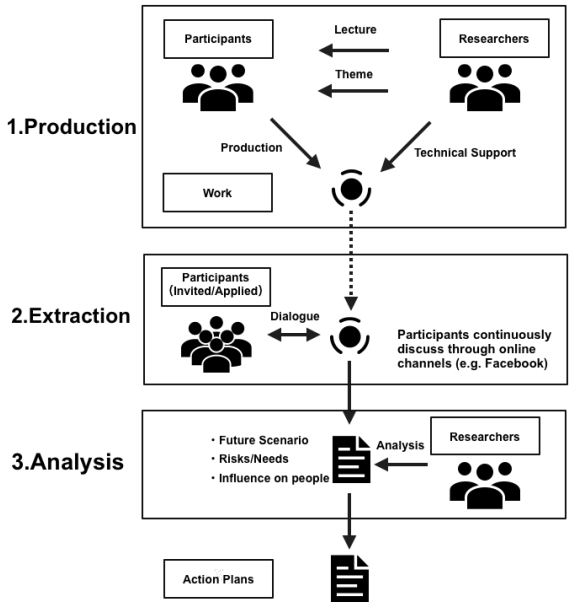

Figure 1 Overview of workshop processes.

comparison with the robotic pet AIBO. While both robots seem to behave autonomously, their design architectures appear very different. Roomba is designed to behave autonomously, without people's interactions or interventions, while AIBO is designed to interact with people. However, interestingly, some have come to regard Roomba as a type of robotic pet. This may be because Roomba interacts with people indirectly thanks to its autonomy. This kind of perspective on artificial life is useful in imagining and thinking about a society in which people and autonomous systems can co-exist.

The overall framework of the workshop is based on speculative design, which is a design method to explore the uncertainties of everyday life and emerging technology in a new light (Donne, 2013). The emerging technology chosen here is artificial life. We also employed a science fiction prototyping method that uses science fiction to describe and explore the implications of futuristic technologies and the social structure enabled by them (Johnson, 2011).

Based on these components, we have designed a workshop program composed of three main elements: (1) production, (2) extraction, and (3) analysis (see Fig. 1.) In the production process, lectures on artificial life are first given to participants by artificial life researchers. Then, participants and researchers jointly produce a short science fiction story, which helps participants to imagine realistic futures.

In the extraction stage, we extract technical possibilities, risks, and ethical programs associated with technology and society through dialogue with participants. Finally, in the analysis, researchers come up with directional action plans for addressing the possibilities and risks of the technologies extracted during the extraction process.

Workshop Report

In February and March 2017, we ran our first five-day workshop with 11 participants, including engineers, artists, architects, designers, and students (Fig. 2). The first four days were assigned to the production process, in which the first two days were used for understanding and learning about artificial life and the second two days were used for producing science fiction scenarios. The final day was used for the extraction and analysis processes.

During the five-day workshop, participants discussed possible futures through questions such as "What is the boundary between life and non-life?" and "What are the possible issues that autonomous systems bring to our society?" As for the outcome, nine science fiction short stories were produced. We selected four stories which were read by performers in a final presentation to the public.

Finally, we analyzed the science fiction stories and extracted the emerging risks and needs through discussion with the participants. Some of the extracted issues include anxiety driven by systems that may control human decision-making at the unconscious level, the emergence of trustworthy systems, and credit for creations by artificial life.

Figure 2 Pictures taken at the workshop.

Conclusion

In this paper, we introduced an artificial life workshop developed to explore the new cooperative societies emerging from the coexistence of complex automated systems and people. With current artificial intelligence technology pursuing mostly convenience and efficiency, there is a danger that human autonomous decision-making may become weakened. Technology, perspectives, and philosophies on artificial life can be useful tools for imagining possible futures in a realistic way and facing the ethical and social questions that arise in a more creative manner. Various efforts are being made to assess the social risks of artificial intelligence worldwide. Bringing in the artificial life perspective has great potential to contribute to such activities. We believe collaboration between creators in other fields and researchers in artificial life will lead to the development of alternative social values and thus to the realization of a collaborative society where autonomous systems and people co-exist in harmony.

References

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