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研究課題名(和文) Translating responsibility - the ethical and social impact of assistive robotics in Japan and Germany

研究課題名(英文) Translating responsibility - the ethical and social impact of assistive robotics in Japan and Germany

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研究成果の概要(和文)：1.文献データベース：検索索引とデータベースのカテゴリカタログが完成しました。
 2.研究と知識マップ：日本とドイツの支援ロボットの分野は、データベースの基礎となるのと同じカテゴリーに従って分析され、マッピングされている。将来の研究のための関連分野が特定されている：ヒューマンマシンの関係。
 3.国際協力：ドイツと日本のSTSとロボット技術の専門家との国際的なネットワークコラボレーションが確立されました。2017年2月、オルデンブルク大学(ドイツ)でワークショップが開催されました。参加者はネットワークを構築し、「支援ロボットのためのガイドライン」に関する協力を促進することに合意した。

研究成果の概要(英文)：1. Literature database: The search index and the catalogue of categories of the database has been completed. Relevant research literature of major databases has been retrieved according to the categories and according to Japan and Germany.
 2. Research and knowledge map: The field of assistive robotics in Japan and Germany has been analyzed and mapped according to the same categories that underlie the database. A relevant field for future research has been identified: human-machine relation.
 3. International collaboration: Based on PI's initiative, an international network collaboration with experts on STS and robotics in Germany and Japan has been established. In February 2017, a workshop hosted at University of Oldenburg (Germany) was held. Participants agreed to set up a network and to foster collaboration on "Guidelines for assistive robotics".

研究分野：科学技術社会論

キーワード：assistive robotics ethics society intercultural comparison Japan Germany

1. 研究開始当初の背景

In recent years, robotic technologies passed a decisive step of development and begin to enter various domains of human life. The so-called "Robot Revolution" affects labor/ services, military/ security, research/education, entertainment, medical/ healthcare and personal care/companions. As is generally the case with technological innovations, also robotics raises ethical challenges. In particular, robotics gains severe impact because robots come as autonomous agents which directly interact with humans. Regarding autonomous behavior of robots which is technically feasible but often restricted when it comes to real-world applications, the central ethical challenge concerns responsibility: who is responsible for a robot's behavior? Who is responsible if a self-driving car causes an accident, who is responsible if a military robot kills "friendly" soldiers (as already happened in 2007 in South Africa), who is responsible if a care robot injures or kills an elderly person or a child? This list could be extended easily as every domain of human life will sooner or later be supported by robots. On the other hand, there is no clear ethical, legal or social account on how to handle this challenge. This is partially due to continuously evolving technologies which elude ethical reflection by their innovative force. Another reason can be found in diverging cultural attitudes towards technology which prevent an unambiguous conception of what is technologically desirable.

2. 研究の目的

This project aimed at assessing the ethical and social impact of assistive robotics. By combining an interdisciplinary and intercultural approach, the complex interplay between robotic technologies, ethical/ legal norms and cultural/religious attitudes will be surveyed from a Japanese and German perspective. The goal is to derive a global view on the ethical challenge of responsibility by robotic technologies.

3. 研究の方法

The interdisciplinary and intercultural translation was implemented in five successive phases:

1. Assessing assistive robotics in Japan and Germany

2. Assessing ethical and legal norms related to AR in Japan and Germany

3. Assessing cultural and religious attitudes towards assistive robotics in Japan and Germany

4. Assessing challenges of responsibility by AR in Japan and Germany

5. Finalizing the project: cleaning database, establishing international cooperation

4. 研究成果

Methodological groundwork: The relation between culture and ethics has been exemplified regarding assistive robotics. Robotic architectures show that robots develop their agency in interaction with humans. In this view, cultural contexts of robotic usage imply a shift from an individualistic to a relational perspective according to which robots gain ethical relevance as parts of socio-technical systems. The implied cultural impact on ethics is exemplified by presenting the seal robot Paro, a healthcare and therapeutic robot which is used in Japan and Germany. By linking cognitive analysis of robotic architectures with the concept of socio-technical systems and its reference to cultural contexts, the relational approach explains why robots do matter ethically.

1. Literature database:

The search index and the catalogue of categories of the database has been completed. Relevant research literature of major databases has been retrieved according to the categories and according to Japan and Germany (in total 2847 entries).

In difference to common mapping methodologies (such as PESTEL or DESTEP-analysis), the following classification identifies normative factors and their impact on different domains of assistive robotics.

Furthermore, an intercultural approach has been implemented in order to compare the Japanese and German approach beyond common stereotypes.

Categories for each Japan and Germany are:

A Assistive robotics

B Embedding: domain of implementation

1. Demography

- 2. Society
 - C Shaping drives: implementation by societal systems
 - 1. Healthcare
 - 2. Technology
 - 3. Politics
 - 4. Economy
 - D Normative drives: purpose and criteria
 - 1. Ethics
 - 2. Nursing
- 3. Law
- 4. Religion
- E Case study: Paro, HAL

This database is organized as a Zotero group library and therefore open to public access. For future research purposes, the existing library is only made accessible to the newly established network members (cf. 3. below).

2. Research and knowledge map:
The field of assistive robotics in Japan and Germany has been analyzed and mapped according to the same categories that underlie the database. This analysis revealed a multitude of factors. The care-relation, including ethical aspects which directly concern the human-human/human-robot interaction in care scenarios, was identified as a relevant field for future research.¹

3. International collaboration: Based on PI's initiative, an international network collaboration with experts on STS and robotics in Germany and Japan has been established. In February 2017, a workshop hosted at University of Oldenburg (Germany) was held. Participants agreed to set up a network and to foster collaboration on "Guidelines for assistive robotics".

This network collects international researchers from sociology, philosophy, cultural anthropology with the common interest in STS. We agreed to enter in a normative and constructive discussion on how to shape future robotic lifestyles.

5. 主な発表論文等
(研究代表者、研究分担者及び連携研究者には下線)

〔雑誌論文〕(計 2 件)

Grüneberg, P.: "The Cultural Impact on Ethics: Robotic Agency in Socio-Technical Systems," in: Global Japanese Studies

Review 8/1 (2015), pp. 19-36.

Grüneberg, P., Kadone, H. and Suzuki, K.: "Voluntary initiation of movement: multifunctional integration of subjective agency," in: Dumitru, M. L., Pasqualotto, A. and Myachykov, A. (eds.): Multisensory Integration: Brain, Body, and the World, Lausanne, 2016, pp. 49-62.

〔学会発表〕(計 件)

〔図書〕(計 件)

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〔その他〕
ホームページ等

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