

## Summary Paper

### **European Workshop on Ethical Issues in Human-Machine-Interaction and Service Robotics, 06.05.2015, Brussels**

**organized by the Federal Ministry of Education and Research (BMBF) and the National Contact Point (NCP) for Human-Technology Interaction in cooperation with the European Commission Directorate General for Communications Networks, Content & Technology (DG Connect)**

Human-Machine-Interaction and Service Robotics provide promising opportunities to deal with the challenges of demographic change in Europe. Technical solutions can support an ageing population in various ways as e.g. in the area of active ageing and healthy living, but also in terms of social inclusion and care. At the same time these technologies raise important ethical questions with respect to privacy, security, autonomy and dignity. However, it is still unclear how ethical issues can be adequately addressed within technology-driven research projects in the areas of Human-Machine Interaction and Service Robotics. It was the purpose of the workshop to discuss current approaches on the integration of ethical evaluations in research project both from the perspective of research funders and researcher in ethical domain. The concluding recommendations on the integration of ethics in research projects and funding procedures on national and EU level are drawn from the presentations and discussions that took place in the workshop.

#### **Presentations on the Workshop:**

**Dr. Rosita Cottone** (German Federal Ministry of Education and Research, BMBF) started the workshop by looking at Human-Machine-Interaction from the BMBF's point of view. Since technology is entering more and more areas of people's lives, approaches from various disciplines such as ICT, robotics, neural and cognitive sciences, design, psychology and social sciences have to be combined to solve the key societal challenges as defined in the new German High-Tech Strategy, which encourages both technical as well as social innovations. Dr. Rosita Cottone specified that for all funding instruments within the HMI division the consideration of ethical issues is mandatory. For this purpose the concept of Integrated Research Funding has been developed, which focusses on ethical, social and legal implications (ELSI). For simplicity, in the following ethics can be considered as the overall subject on whom social and legal aspects can be derived from. Applicants in all HMI calls are required to explain whether and in how far they have taken ethical aspects into account in their project. Furthermore, consideration of ethical aspects is an evaluation criterion for any proposed project, which will be evaluated by reviewer, specialized in the field of ethics. If necessary, applicants are required to involve external expertise in the fields of ethics and social sciences in their project in order to have the option of getting funded.

**Horst Krämer** (European Commission) completed the activities on funding agency level by presenting an overview of ethical issues in the EU Programme for Research and Innovation Horizon 2020. Referring to the Horizon 2020 subtopic "science with and for society" he explained the concept of pairing scientific excellence with social awareness and responsibility. This approach to research and innovation is called Responsible Research and Innovation (RRI). Researchers, citizens, policy makers, business and third sector organisations are encouraged to work together in order to align innovative technologies with the values, needs and expectations of European society. Within RRI Ethics is an important element to monitor economic, legal, and social issues related to technological developments. Contributions should explore the potential impacts of envisaged technological developments in order to mitigate risks and inconveniences as well as optimize benefits. Horst Krämer emphasized the idea of ethical reviewers, which systematically carry out ethics reviews for proposals raising ethical issues. Applicants have to detail how they plan to address them in sufficient detail

already at the proposal stage. Concluding examples on ethical appraisal where shown with the focus on data protection. The shown ethical review resulted in the anonymization of personal sensitive data of considered research project, which was not intended at the first place.

**Prof. Arne Manzeschke** (University of Nuremberg) and **Dr. Charlotte Diehl** (University of Bielefeld) presented an exemplary model for ethical evaluation and analysis of socio-technological arrangements and its application in a project context. As part of the BMBF's funding activities in the field, a study on ethical questions in the area of age-appropriate assisting systems has been conducted. The hereby developed evaluation model refers to 7 ethical core dimensions (care, autonomy, safety, justice, privacy, participation and self-conception) and is differentiated according to different user groups (R&D, providers, users). Guidelines as a further part of the study primarily address providers, who want to implement a certain assistive system because they have the mandate to shape things before they are implemented. The majority of the guidelines concentrates on the individual level and applies a consequent orientation on the user. The main part of the study concentrates on the MEESTAR -Model - a model for the ethical evaluation of socio-technical arrangements. MEESTAR is currently used in a number of German research projects (mandatory) in the assistive technology domain. Working with MEESTAR (ideally in the form of interdisciplinary workshops) involves the systematic consideration of three dimensions. MEESTAR is referring in the 1st dimension to the 7 ethical core values. The 2nd dimension relates to four stages of ethical sensitivity, ranging from "completely harmless" to "should be opposed from an ethical viewpoint". The 3rd dimension provides three levels of observation (individual, organizational, societal). All three dimensions together allow for a comprehensive ethical evaluation of a social-technical arrangement. The model is used in various research projects to discuss and evaluate concrete scenarios of applied technologies. The KogniHome-Project (2014-2017 funded by the BMBF) is one. In this context, the KogniHome-Project can serve as an example. In the project intelligent home providing services for inhabitants ("The Intelligent Apartment") are developed, combining assistive, smart technologies in the household for elderly and handicapped people (smart digital kitchen, an intelligent entrance hall and door, personal support coach). The scientific focus is on the development of human-centric systems for interaction, which combine multi-modal cognitive abilities, background knowledge, socio-emotional factors, and adapt to the needs and wishes of different users. This raises a number of different ethical questions and potential problems. Therefore a systematic evaluation of ethical, legal, and social implications are part of the project (regular tests, studies and surveys involving different target groups) and ethics workshops take place on a regular basis.

The MEESTAR workshops – guided by an expert – include researcher and developers, providers and users of a distinct technology. The model presented to the participants and serves a guiding tool for the identification and evaluation of ethical problems in application scenarios. Following the results of the discussions, concrete work tasks are defined and agreements on methods for resolving the ethical problems are taken. The workshops help the project partners to get a better understanding of the complexity of the own project and the related ethical dimensions. MEESTAR assists the participants to become more conscious about ethical problems and also about the different perceptions and interpretations of other participants/groups in the project. It also can play a vital role in identify commonly understood urgent problems. According to Prof. Manzeschke, there is a need for further research in the field:

- Technological developments raise new ethical questions: (e.g. the direct coupling of human and machine on the motor level and cognitive level)
- The question concerning the right places for societal deliberation with the aim of avoiding a privatisation of these questions.
- Follow-up problems of the transformation of informal into formal, ICT-supported ways of helping and caring.
- Gender and cultural aspects in the context of AAL technology
- The effects and meanings of ICT-induced emotions

Insights from a European project on Robotics were given by **Prof. Thomas Sorell** (University of Warwick) and **Prof. Heather Draper** (University of Birmingham). Prof. Sorell spoke about relevant ethical norms for robots to support the elderly and presented the ethical framework for elderly care-robots that was developed in the ACCOMPANY<sup>1</sup> Project (Acceptable robotic companions for ageing years), funded by the European Commission (2011-2014). In comparison to telecare and non-robotic assistive technologies, robots do add a certain quality to the human-machine-relation, they are “present to” a subject, especially in a care situation. This additional quality enriches the human-machine-interaction in a certain way and leads to certain behavior reactions (e.g. imagination) and behavior expectations or requirements (kindness, enablement, companionship) of the subject towards the robot. The ethical framework in ACCOMPANY takes this into considerations. It is centered around a set of core values (not much different that the MEESTAR categories): Autonomy, independence, enablement, safety, privacy, social connectedness. Arguing from a more liberal viewpoint, the value of autonomy is given the most weight in the case of values conflicts, even above safety. Prof. Draper explained that in ACCOMPANY, a three phase ethical evaluation took place. After the development of the initial framework, the potential stakeholders’ views about the potential tensions between these principles were examined. The final framework then took into account the results of this exercise. In order to get insights on the stakeholders’ views on the ethical issues in robotics and potential tensions between values (in or among stakeholder groups, i.e. older people, informal carers, formal carers), different scenarios were developed and discussed in focus groups with 123 participants in total (in the UK, the Netherlands and France). The work resulted in a big empirical data set that was analysed in-depth afterwards. Some findings from the empirical analysis:

- A value framework that promoted autonomy as the organizing value in relation to the other values (safety, social connect privacy, enablement and independence) seemed likely to reflect the view of potential stakeholders. Participants in all groups thought older people had to be allowed to take risks.
- The capacity of the robot to enable users generated a mixed response. The extent to which users could resist being enabled put enablement in tension with independence.
- The robot will operate in areas where there are existing ethical controversies (e.g. relationships and power plays within the care triad – who controls the robot?). Designers need to be aware of where particular design features will situate robots within these controversies.
- The role assigned to a robot is likely to generate expectations about its behaviour, which will be judged against the ethical norms governing humans occupying the same role.
- Privacy issues are becoming more complex than in human-to-human care relations. The value of the robot’s capacity to retain and share information for the purposes of enablement is best maintained by ensuring that privacy norms are respected and the older person retains control of information that the robot gathers. Robots may, however, afford older people more privacy than human carers.
- Acceptance: It is important to have a value framework and an agreement under which the robot is introduced. An agreement could neutralise what might otherwise seem paternalistic.

In her presentation and comments to the other presentations the commentator **Dr. Marjo Rauhala** (Vienna University of Technology) drew attention to the multiple ethical dimensions of assistive technology design, implementation and use. The significance of ethics in assistive technologies (AT) have to do (among others) with the following aspects:

Target groups of these technologies are - potentially (but not necessarily) - vulnerable user groups. The aim of the technological intervention is the well-being, independent living of older people.

- Some of these technologies have a potentially invasive character, in particular with regard to privacy, and their context of use is the private home.

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<sup>1</sup> <http://accompanyproject.eu/>

- Furthermore, some new technologies entail the possibility of delegating decisions to machines in this context.
- Overall, AT development and implementation should always be preceded by a systematic ethical investigation, since several important and commonly identified ethical dimensions are involved: safety, security, reliability, liability, promoting autonomy and independence, justice, integrity and dignity.

Rauhala pointed out that the available models for assessing the ethical dimensions in research may not be sufficient or suited as such the assistive technology context. The biomedical/clinical model for instance may fail to identify some issues that are relevant from the perspective of assistive technology R&D. The biomedical/clinical model is currently **dominant in assessing** research ethics and it can be experienced as increased requests to obtain formal ethical approval. The focus of such model tends to be on harm to participants, informed consent, data protection (visible/reflected in the H2020 assessment process). Rauhala pointed out that there are good reasons to focus on ethical issues that are typical for the assistive technology field as its issues may be partially different from those relevant in the medical/clinical context. Still, there are many shared issues such as participant safety, informed consent, data protection, risk of 'invasive' techniques. Overall, it is very positive that the AT fields are seeking ways to form their own frameworks to ethics and ways to identify and address ethical issues. This can contribute to the identification of the relevant issues and provide constructive ways of solving them.

Rauhala argued that ethics needs to be integrated into research and it must be continuously present in AT projects:

- AT technologies participate in shaping the discourse on basic questions in ethics. These include: What is the good life? What kind of society do we want to live in? How do we treat others who are in weaker positions? What is the good way of providing care?
- Ethics is not *only* about regulatory compliance
  - currently there is preoccupation on risks, but there researchers must also be familiar with the benefit of ethical impact analysis (e.g. acceptance of products).
- Ethics needs integration and internalization in the R&D process
  - ad hoc evaluation by ethics committee at the beginning or end of project not enough as unexpected ethical issues can appear any time in a research project
- In general, awareness of ethical dimension embedded in AT is increasing, but there is a need to do more. The potential of integrating ethics is good as most engineers in the AT field today are already used to integrating heterogeneous materials in their work. They already work with materials, legislation, expertise, machines, programs, standards – if ethics is presented to them in way they can understand and work with, the willingness to take up ethical considerations and to include ethicists in the R&D process would increase. This requires openness and the will to exchange on equal terms between engineers and ethicists, Rauhala reminded.

Against the background of the presentations and the comments a lively discussion developed and in what follows some draft recommendations are presented.

### **Recommendations on the integration of ethics in R&D projects and funding activities in the area of assistive technologies (Human-Machine-Interaction and Service Robotics)**

- Ethical Frameworks in AT (such as the ones presented in the workshop - MEESTAR, ACCOMPANY project) play an important role in order to assist developers in ethical self-assessment and to guide the exchange with stakeholders/users on ethical issues. They could be used as self-assessment and an awareness and reflection tool, especially for interdisciplinary R&D teams. They provide a comprehensive view of the complexity of the

determinants and dynamics of the sources of ethical conflicts in the AT contexts. They are tailor-made for the AT context and go beyond the biomedical/clinical framework.

- Practical interaction and engagement with users and stakeholders throughout the research process (e.g. based on the translation of ethical concepts in concrete application scenarios of technology) is essential for a full ethical impact analysis of a technology and should be accompanied by additional ethical/empirical research. User engagement strategies in AT need to be adapted to physical and cognitive impaired and disabled, elderly users.
- Ethical frameworks in AT in general must be context-sensitive and adaptable to new technological/social/developments. Their development should also involve those who use the frameworks (engineers) and who are affected by them (users).
- Funders could require / recommend the use of frameworks and user engagement for discussing ethical dimensions of a proposed research. They could also be used voluntarily by the research community, providing a trademark or stamp of approval or explicit commitment effect: 'Project AT-X' uses the MEESTAR framework endorsed by the 'Finance Instrument Y'.
- Ethical considerations in AT need to take account into ethical and normative diversity in Europe (liberal vs. social welfare model or promotion of autonomy vs. paternalistic protection)
- Effects of ethical assessments in projects and research should be observed and evaluated on a long term basis in order to identify benefits, challenges and good practices and to draw from previous experiences in conceptualizing new approaches. Different ethical frameworks and approaches in research projects should be compared, the same applies to different national strategies to include ethical impact analysis by research policy makers and funders. A repository of current approaches, standards and procedures in this field would be helpful for further development.
- Other Instruments to foster the integration of ethics in research projects:
  - Ethics as evaluation criteria, explicit requirement in call for proposals, ethical expertise in the review board of programmes.
  - Training programmes for engineers/philosophers/social scientists, together with their associations
  - Ethics review and input should include both research ethics *and* AT Ethics
  - Advisory services in ethics for projects/SME
  - Networking of Ethicists working on technology projects and multi-disciplinary knowledge-sharing across disciplines and research areas
  - Mutual learning of engineers and ethicists on technology and ethical impact
- The AT knowledge triangle needs to be completed by industry/SME, these stakeholders need to be more involved in ethical considerations and practices in the future.

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