

## *The VIROS Project: Vulnerability in the Robot Society*

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The objective of this poster is to introduce the VIROS project at the University of Oslo, Norway. This project will run over 5 years, starting in 2019, facilitating a collaboration between researchers in robot engineering, law, and social sciences.

The increasing deployment of robots and artificial intelligence (AI) systems is introducing new layers of critical infrastructures in various areas of our society. This, in turn, contributes to new digital vulnerabilities and poses novel legal and regulatory questions. The VIROS project investigates the challenges and solutions in regulating robotics – legally and technically – particularly with respect to addressing the safety, security and privacy concerns such systems raise. The impact of the project will be ensured by involving multiple relevant stakeholders in the Norwegian public sector, consumer advocates, three robotics companies (two Norwegian and one Japanese), and leading international roboticists.

The overarching issues that the project will tackle are: (i) how can we address the challenges robotics poses to human security, privacy and safety through technological and regulatory choices? (ii) how does the design of the physical aspect of robots affect the security, privacy and safety concerns and to what degree does the physical component of robotics justify its conception as a distinct regulatory field?; (iii) in light of on-going technical development of robots, to what degree are existing legal and ethical frameworks in the area of security, privacy and safety adequate to deal with developments in robotics and AI?; (iv) which technological choices and regulatory models could be revised and/or devised, and in which ways, to develop policies and technical solutions that further facilitate robotics and AI in publicly acceptable directions?

In tackling these issues, the project will examine the validity of at least three general hypotheses. One hypothesis is that the importation of robots from factories and other controlled environments to less controlled settings involving close interaction with humans (such as homes) necessitates rethinking of how security, privacy and safety issues are addressed in robot design and regulation. The key focus here is on an integrated assessment that takes into account technical, social, ethical and legal factors. Another hypothesis is that soft law is particularly suited to regulating the highly complex and rapidly evolving field of smart robotics, but that certain basic requirements and incentives may nevertheless need to be introduced through legislation. A third hypothesis is that making a careful selection of hardware and software technologies applied in robotics will substantially ameliorate the robot-induced threats to security, safety and privacy.

The project will address these issues along two main prongs of research:

- Prong 1 – smart robots, privacy, security and safety
- Prong 2 – healthcare robots