H2020 COVR FSTP LIAISON – D2.5 LIAISON Lessons learned and evaluation report.

Fosch Villaronga, E.; Drukarch, H.G.

COVER

LIAISON

D2.5 LIAISON Lessons learned and evaluation report

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Author(s):	Eduard Fosch-Villaronga (eLaw, Leiden University) Hadassah Drukarch (eLaw, Leiden University)
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CONTENTS

SUMMARY

While robots should be safe, robot regulatory frameworks do not always frame technology development accurately. LIAISON investigates to what extent compliance tools, in this case, the COVR toolkit, could be used as data generators for policy and standard makers to unravel an optimal regulatory framing for existing and emerging robot technologies and improve robot technology overall safety and market entrance ease. As such, LIAISON aligns with the overall COVR goal to reduce complexity in safety certifying robots.

New technologies sometimes question and challenge existing norms, breathing into existence the need for legal change. While the pace of technology dramatically accelerates, however, legal responsiveness does not always follow as a consequent step. As no formal communication process between robot developers and regulators from which policies could learn has been established yet, a stepback mechanism for robot governance as novel as that introduced by LIAISON is yet to be introduced to all stakeholders involved, in particular robot developers and policy/standard makers. To prove the feasibility and added value of the creation of this link between robot developers and relevant regulators, for the LIAISON project, we focus on three particular standards: ISO 13482:2014 on personal care robots, IEC 80601-2-78:2019 on rehabilitation robots, and EN ISO 18497:2018 on agricultural machinery and tractors. The policy and standard makers involved for this purpose represent both private standardisation organisations and the European Commission.

In this report, we present the lessons learned from and the evaluation following the LIAISON project. The LIAISON project has provided an insight into the potential evidence-based robot governance. Overall, LIAISON has proved to be a useful tool in linking all the stakeholders in the robot development chain, including affected parties. Points for improvement include: 1) ease community building, engagement and cooperation; and 2) gap bridging with affected communities throughout the robot development and robot governance life-cycle. Moreover, LIAISON has offered new avenues for expansion related to: 1) scientific knowledge for policy extraction mechanisms; and 2) automated compliances processes.

1. INTRODUCTION

COVR stands for "being safe around collaborative and versatile robots in shared spaces", and is a European H2020 Project which aims to reduce the complexity in safety certifying cobots significantly. In this respect, the project has developed the COVR Toolkit, an online tool that guides developers in their legal compliance process, from helping them find relevant technical standards/directives/protocols to guide them on performing a risk assessment.

Assessing risks through experimentation is essential to ensure robot safety and compliance with existing norms. However, standards do not always frame technology development accurately. LIAISON investigates to what extent compliance tools (tools that help comply with the legislation, such as the COVR toolkit) could be used as data generators for policy and standard makers to unravel an optimal regulatory framing (including change, revise, or reinterpret) for existing and emerging robot technologies. LIAISON is a crucial stepback mechanism to help align robot and regulatory development and improve robot technology's overall safety and market entrance ease. To prove the feasibility and added value of the creation of this link between robot developers and relevant regulators, for the LIAISON project, we focus on three particular standards: ISO 13482:2014 on personal care robots, IEC 80601-2-78:2019 on rehabilitation robots, and EN ISO 18497:2018 on agricultural machinery and tractors. The policy and standard makers involved for this purpose represent both private standardisation organisations and the European Commission. As such, LIAISON aligns with the overall COVR goal to reduce complexity in safety certifying robots by providing policy and standard makers with the necessary knowledge about legal inconsistencies, new categories, or new safety requirements (including psychological) to update existing frameworks where necessary and to ensure that the next generation of robots is 'safe' to the full extent of the word (*see* figure 1 in the annex). In this way, LIAISON contributes to the COVR mission by adding a link to public and private regulators to complete the cobot value chain.

In this report, we present the lessons learned from and the evaluation following the LIAISON project.

2. LIAISON

2.1. BACKGROUND

“The art of progress is to preserve order amid change, and to preserve change amid order” – Alfred North Whitehead.

Robot technology is one of the many technologies that challenge the regulatory framework in various ways, including ethics and security for responsible innovation, privacy, and responsibility allocation. As products, robots widely differ in embodiment, capabilities, context of use, intended target users, and many regulations may already apply to them. Having tools such as the COVR Toolkit can be of help. However, new applications may not fit into existing (robot) categories, legislation might be outdated and confusing categories, and technology-neutral regulations may be hard to follow for developers concerned about their particular case. A recent open consultation launched by the European Commission, for instance, acknowledges that current European Harmonized Standards do not cover areas such as automated vehicles, additive manufacturing, collaborative robots/systems, or robots outside the industrial environment, among others (Spiliopoulou-Kaparia, 2017). In light of all the issues this technology arises, part of the literature accentuates the need for an issue manager. Marchant and Wallach (2015) proposed the creation of "Governance Coordinating Committees (GCC)" for the governance of emerging technologies like AI.

Furthermore, the European Parliament proposed creating a European Agency for Robotics and Artificial Intelligence early in 2017, and Schatz put forward the creation of an emerging technology policy lab within the US general services administration in 2018. However, what lacks in robot governance is a backstep mechanism that can coordinate and align robot and regulatory development (Fosch-Villaronga & Heldeweg, 2018). Overlooked in the latest review of "the grand challenges of science robotics," this challenge has already been raised in the literature, albeit only more recently (Yang et al. 2018), and relates to the idea of how policies can frame the rapid development of robotics. LIAISON contributes to these approaches by proposing the *modus operandi* of issue managers, if they were ever to exist, and revolves around the following main research question:

Could the use of compliance tools, such as the COVR Toolkit, as data generators for robot policy purposes reduce emerging robot governance complexity?

LIAISON envisions an iterative regulatory process for robot governance, a theoretical model that represents a practical step forward in the coordination and alignment of robot and regulatory development, called the Iterative Learning Governance Process (ILGP). This research project conceives an effective way to extract compliance and technical knowledge from compliance tools (tools that help comply with the legislation such as the COVR toolkit) and direct it to policy and standard makers to unravel an optimal regulatory framing (including change, revise, or reinterpret) for existing and emerging robot technologies. The primary outcome of the LIAISON Research Project will be the design concept for liaising robot development and policymaking to increase overall robot safety. This design concept will further develop the *Iterative Regulatory Process for Robot Governance*, which was ideated as a theoretical model that links technology impact assessments to legislative ex-post evaluations via shared data repositories intending to create evidence-based policies

that can serve as temporary benchmark for future and new uses or robot developments (Fosch-Villaronga & Heldeweg, 2018, 2019). Part of the 'technical challenge' is to put such a theoretical model into practice and in the context of the COVR project. Explained further in figure 2 (annex), such iterative regulatory process for robot governance stresses that in the light of a new robot development or use, and after assessing all the impacts (and incorporating the findings into the robot itself), it is essential to compile all the Regulation-to-Technology uncovered barriers and constraints that do not allow the roboticists to proceed with their creation. Having collected those constraints in a Technology-to-Regulation manner, the regulator can act thereupon supported by the accountability tool's information, in this case, the COVR Toolkit.

2.2. APPROACH

Seeing regulation (broadly understood) as a tool to advance social goals and subject to adjustments towards this end, LIAISON discusses different regulatory approaches to use iterative governance processes for robot governance. For that purpose, LIAISON aims to engage with representatives from the industry, standardization organizations, and policymakers to present compliance tools as a potential source of information for policy action and understand what information would be helpful to them (e.g., through exploratory meetings, surveys, and workshops). Applying such a novel and interdisciplinary methodology is instrumental in identifying unregulated and underestimated challenges (e.g., over-time integrative and adaptive systems' safety, cyber-physical safety, psychological harm) that regulations should cover, and in gauging the response to, support for, and perceived necessity among relevant stakeholders of the introduction of the LIAISON model.

Following the ideal that lawmaking 'needs to become more proactive, dynamic, and responsive,' LIAISON proposes the formalization of a communication process between robot developers and regulators from which policies could learn, as depicted in figure 1 (annex), thereby channeling robot policy development from a bottom-up perspective towards a hybrid top-down/bottom-up approach. This is novel, as most approaches have been top-down solely, disregarding the richness field knowledge could provide in helping identify gaps and inconsistencies in frameworks governing the technology. In practice, LIAISON builds on the COVR toolkit, a compliance tool built as part of the COVR Project, by envisioning and assessing the usefulness of the proposed model based on the theoretical model of an *Iterative Regulatory Process for Robot Governance*. Following through the COVR Toolkit in the capacity of a robot developer, the Toolkit offers a section on standards and directives, allowing robot developers to filter their search results based on domain and appearance. The Toolkit then presents the relevant regulations, directives, and standards which can be freely accessed or purchased by robot developers. After robot developers have assessed the relevant documents, LIAISON enters into the picture. Focussing specifically on standards in 3 domains of application (rehabilitation, personal care, and agriculture), LIAISON aims to uncover the gaps and inconsistencies in the relevant policy documents. For this purpose, we have created two feedback loops to assess 1) regulatory gaps and inconsistencies in the relevant policy documents; and 2) the usefulness of LIAISON based on Toolkit user feedback and the broader community of stakeholders. To this end, we created a survey to match each feedback loop and distributed these among a predetermined pool of stakeholders through various means and on a variety of platforms.

Concerning the first feedback loop, assessing the identified gaps and inconsistencies in the relevant policy documents was refined through a set of interactive workshops, community engagement, and formal meetings. The data retrieved from these surveys have been channeled to a so-called 'shared data repository,' currently comprising a comprehensive Google sheets file. This shared data repository will be accessible to policymakers in due time, who are encouraged to use the relevant data to change, revise, or reinterpret existing frameworks. Once again, these will be presented in the COVR Toolkit, allowing the iterative regulatory process for robot governance to restart.

2.3. GOALS

We believe that the regulatory cycle is truly closed when it starts — or allows it to be started — again upon new challenges/technologies. LIAISON tests the theoretical model of a dynamic, iterative regulatory process in practice, aiming to channel robot policy development from a bottom-up perspective towards a combined top-down/bottom-up model, leaving the door open for future modifications. The above-envisioned process will clarify what regulatory actions policymakers have to take to provide compliance guidance, explain unclear concepts or uncertain applicability domains to improve legal certainty and inform future regulatory developments for robot technology use and development at the European, National, Regional, or Municipal level. Within this regard, LIAISON takes the lead in tackling the existing regulatory challenge, thereby linking robot development and policymaking to reduce the complexity in robot legal compliance. Moreover, by explicitly shedding light on the standardization activities in the abovementioned domains, LIAISON aims to create awareness about the barrier to access for robot developers and other relevant stakeholders concerning such activities.

In the long-term, the expected project results may complement the existing knowledge on the 'ethical, legal, and societal (ELS)' of robotics by providing clarity on how to address pressing but still uncovered safety challenges raised by robots and represent a practical, valuable tool to advance social goals in a robotized workplace. Overall, advances in safety robot legal oversight will provide a solid basis for designing safer robots, safeguarding users' rights, and improving the overall safety and quality of efficiency delivered by robots.

3. LIAISON LESSONS LEARNED AND EVALUATION

- PLEASE FIND A COPY OF THE RELEVANT ATTACHMENTS IN THE ATTACHMENT -

4. REFERENCES

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5. ANNEX

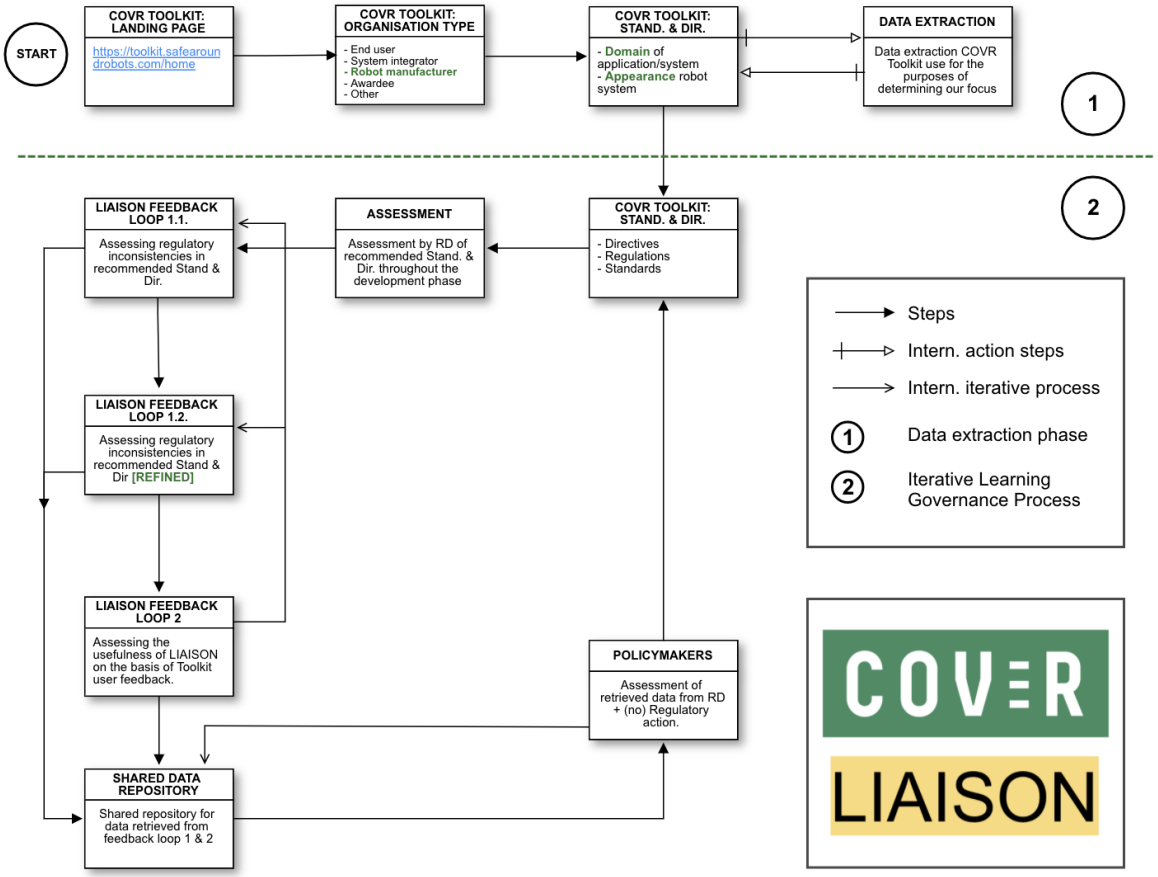

Figure 1: LIAISON Research Project mechanism

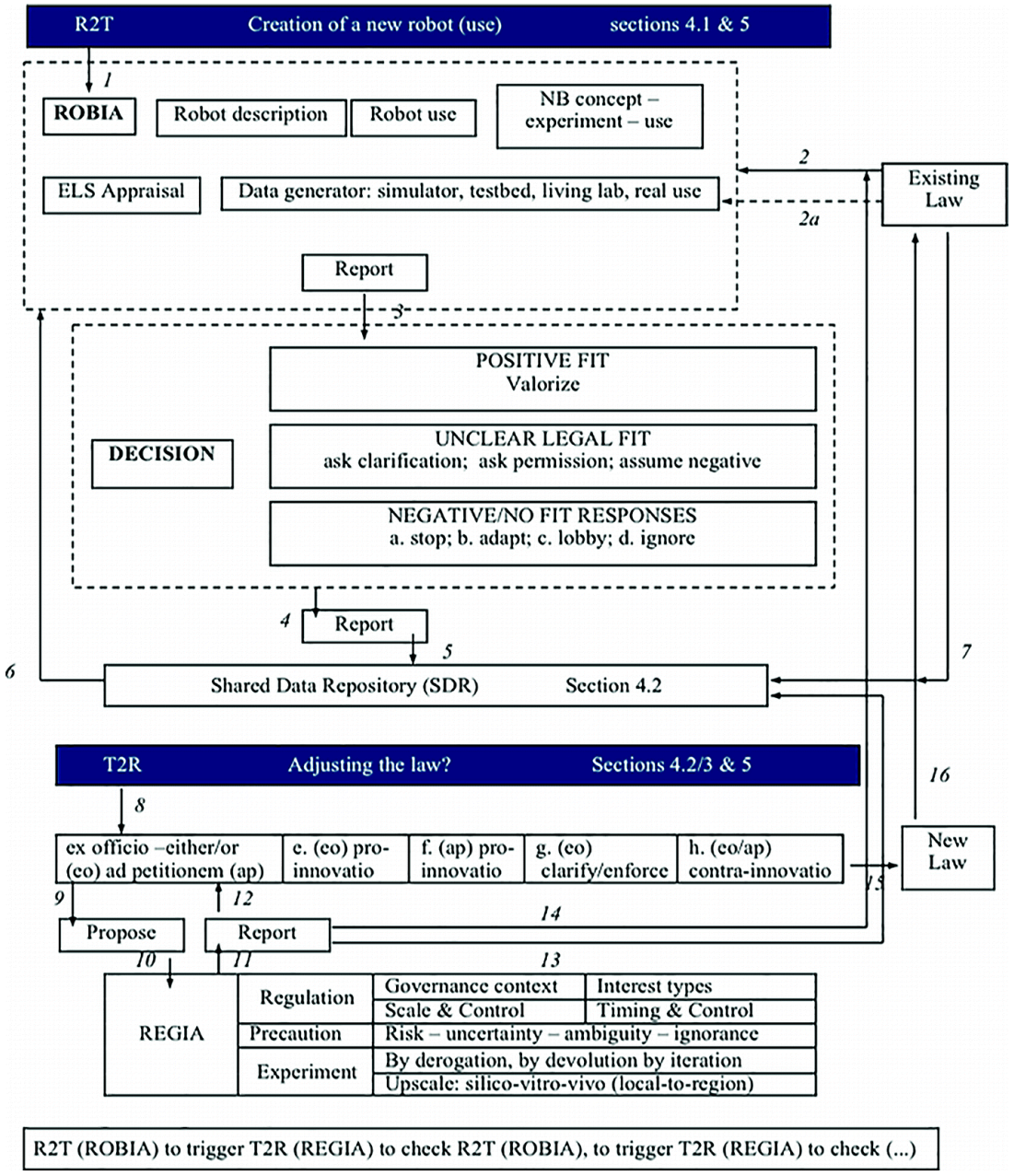

Figure 2: Preliminary iterative process for robot governance[1] (Fosch-Villaronga & Heldeweg, 2018).

[1] As regards the meaning of arrows: #1. signifies that upon the initiative to develop a new robot (use) the ROBIA process commences; #2 and #2a are about information about existing law/legal space being fed into the ROBIA fit to regulation process; #3 outcomes of ROBIA are reported to initiators to decide if and if so, how the development process can be continued; #4 and #5 concern reporting the decision and making information available to the SDR system; #6 is about how (changes in) information in SDR are a source of information to the ROBIA process – as shared learning; #7 is about information about existing law with relevance to robotics is also part of the shared date in SDR (#2 is about specific legal information to a specific ROBIA procedure; #7 about the general updating of legal info in SDR); #8 expresses that upon R2T events a process about possible legal adjustments is started; #9 and #10 when it is decided (ex officio/ad petitionem) that some legal change may be called for, a (basic) proposal is formulated whereupon the REGIA procedure is initiated; #11 and #12 show that outcomes of the REGIA procedure are reported back and feed into the decision on legal change; #13 Information in the report is also fed into SDR to update regulatory information; #14 REGIA report can feed ROBIA without passing via the Existing law> box, as the REGIA report will say something about pros and cons of possible legal change, but should that change follow, then this will communicate via the <New law> box; #15 signifies adjustments in the law; #16 expresses that new law changes and becomes part of existing law.)

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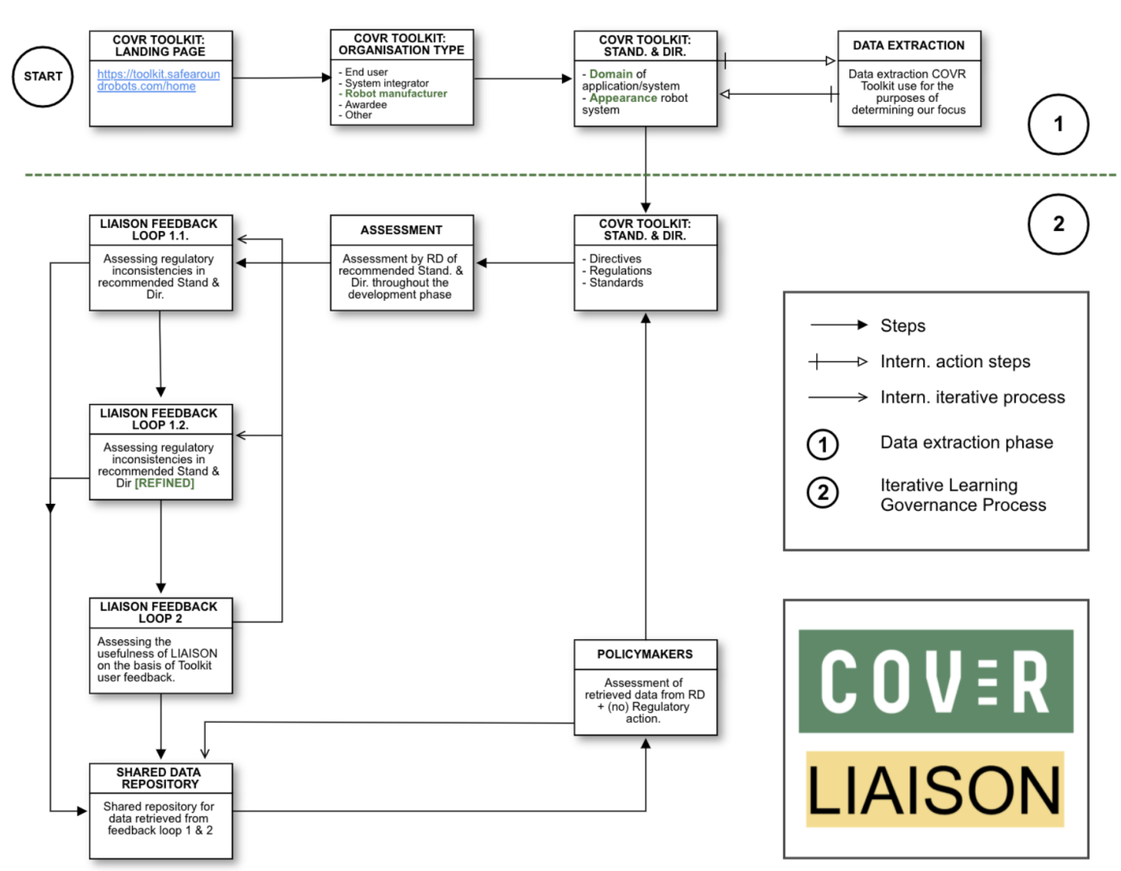
The complexity of robot governance

- Technology and regulation evolve, but **not always simultaneously or in the same direction**.
- Robot developers **struggle to find suitable safeguards in existing norms applicable to them**.
- The robot governance ecosystem **lacks a common platform for all stakeholders to share and learn**.

The LIAISON project

- **Links robot development and policymaking** to reduce the complexity in robot legal compliance.
- Creates a **communication platform** between robot developers and regulators.
- Investigates whether **compliance tools can serve as data generators for robot governance purposes**.



Lessons learned

- **Necessary:**
  - Create a clear link between robot governance and robot development.
  - Address the lack of legal comprehension among robot developers.
  - Establish an ecosystem encompassing all stakeholder interests, which is necessary for adequate robot governance.
- **Desired:**
  - Active stakeholder involvement in robot governance activities as this could ensure that policies reflect reality.
  - Active engagement with robot developers to generate policy-relevant knowledge within the context of robot governance activities.
  - A process reusing the knowledge retrieved from robot developers' compliance processes for policymaking purposes.
  - A strengthened cooperation and cross-domain collaboration within the context of robot governance.
- **Overcome:**
  - Communication and accessibility barriers between policymakers and robot developers to ensure adequate robot governance.
  - The lack of interdisciplinary knowledge between different stakeholders in the robot governance process.

Authors: Eduard Fosch-Villaronga & Hadassah Drukarch H2020 COVR FSTP LIAISON - Grant agreement no: 779966 For more information about the LIAISON project contact: e.fosch.villaronga@law.leidenuniv.nl or h.g.drukarch@law.leidenuniv.nl

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Evaluation

- **A valuable tool**
  - LIAISON can be a useful tool for linking all the stakeholders in the robot development chain, including affected parties.
- **Points for Improvement**
  - Ease community building, engagement and cooperation.
  - Gap bridging with affected communities throughout the robot development and robot governance life-cycle.
- **Avenues for expansion**
  - Scientific knowledge for policy extraction mechanisms;
  - Automated compliances processes;

Want to know more?

Policy leaflet

Policy brief

Recommendations COVR Toolkit

Contact

Eduard Fosch-Villaronga
eLaw Center for Law and Digital Technologies, Leiden University
e.fosch.villaronga@law.leidenuniv.nl

Hadassah Drukarch
eLaw Center for Law and Digital Technologies, Leiden University
h.g.drukarch@law.leidenuniv.nl

Access the project deliverables below