SILICON VALLEY ROBOTICS
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RESPONSE TO NIST RFI 2019-08818

Silicon Valley Robotics is a non-profit 501c6 industry association supporting innovation and commercialization of robotics technologies[1]. Currently, the SF Bay Area is home to the largest cluster of 'Robotics 2.0', with more than 600 companies, 50 academic or national robotics research labs and more than half of the global venture capital spend on robotics and AI, which was greater than $15 Billion USD in 2018.

Right now we are seeing a Cambrian Explosion in robotics, according to TRI CEO and ex DARPA Robotics Program Manager Gill Pratt, and this flourishing of robotics across all disciplines, across all verticals, and in a wide variety of forms and functions can all be described as having certain characteristics in common that we call 'Robotics 2.0'. Where 'Robotics 1.0' did the 3Ds, the dull, dirty and dangerous jobs, these technologies were shut away behind closed factory doors and in safety cages. Robotics 1.0 robots were dumb, and required direct programming.

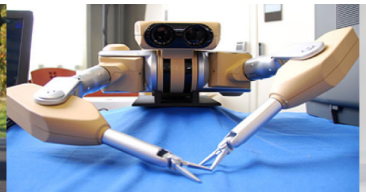
Robotics 2.0 robots are smarter, leveraging sensor technologies and low cost, low power edge computation. Robotics 2.0 robots are effectively embodied AI and as such, require consideration under the NIST request for information about federal engagement in the development of Artificial Intelligence Standards.

CONTEXT OF OTHER EFFORTS:

Many campaigns are underway to provide insight and guidance in the development of Artificial Intelligence and Autonomous Systems, or Robotics. Some of these efforts are linked to national roadmaps, some to professional or standards associations and some to private or research initiatives. We don't attempt to provide an exhaustive listing here, just to highlight the work of ISO/TC299[2], the Technical Committee on Robotics, which has published 20 standards and is working on an additional 10 standards under development, plus a vocabulary.

[1] https://svrobo.org/

[2] https://committee.iso.org/home/tc299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Additionally, Silicon Valley Robotics has participated in the IEEE Global Initiative on Autonomous and Intelligent Systems[3], which has developed the Ethically Aligned Design Principles, and the associated IEEE P7000 Standards Group[4], currently working on 13 approved standards ranging from Transparency of Autonomous Systems to Algorithmic Bias Considerations to Personal Data AI Agent Working Group.

AREAS OF CONCERN:

When you embody AI in physical systems, or robots, you introduce additional causes for concern:

1. Physical safety of people and property
2. Reliability, repeatability, and transparency of a product
3. Difficulty updating systems, or remote operations failures
4. Traffic management in real world and multi-agent coordination and communication
5. 'Nudging' behavior in social robots leading to undesirable social outcomes
6. Difficulty explaining multiple party access to data and devices
7. Difficulty maintaining security of autonomous systems
8. Difficulty considering accessibility of autonomous systems
9. Data collection in new and unexpected times and places
10. Biased algorithms creating justificatory feedback loops
11. Lack of accessible diverse data sets
12. Identification of owner/operator
13. Lack of processes for testing, auditing, registering of robots and AI
14. Lack of processes for public contest of robot or AI behavior
15. Creating public awareness of fair use and misuse of robots
16. Creating public awareness of competencies in development of robots
17. How do we ensure that robots are deployed fairly and benefit humanity well-being

We are ready to engage with NIST in the exploration of these areas of potential standardization, particularly around embodied, social and multi-agent systems.

Best Regards,

Andra Keay, Managing Director Silicon Valley Robotics

[3] https://ethicsinaction.ieee.org/#read

[4] https://ethicsinaction.ieee.org/#set-the-standard