EAGER: Documenting and Analyzing Use of Robots for COVID-19

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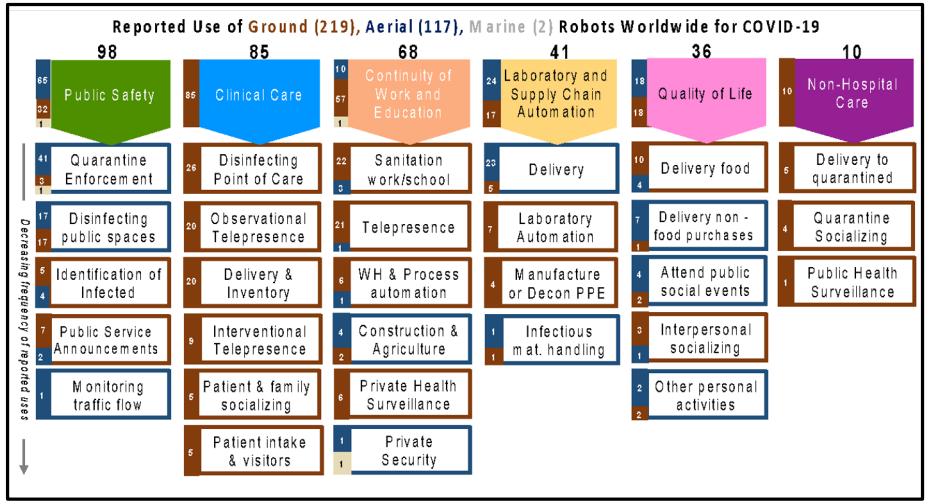
http://roboticsForInfectiousDiseases.org

Data collection, clustering, and multidisciplinary analysis of reports of actual robots in use explicitly for COVID-19 between Jan 24, 2020, and Jan 23, 2021 shows 338 instances for ground (219), aerial (117), and marine (2) in 48 countries in six continents: Africa, Asia, Australia, Europe, North America, and South America. The results were clustered by 6 sociotechnical work domains and 29 uses cases.



Broader impacts:

Invited keynote or panel presentations to IFR, IEEE ICRA, IEEE SSRR, Silicon Valley Robotics

Four journal articles, 2 in review; 2 guest editing for IEEE RAS Magazine and Robotics and Autonomous Systems

Multidisciplinary education exposing two students to engineering, public health, and social science research methods. Increased diversity

Summary of Major Findings for Robotics and Policy

International trends: The US leads in number of robots-- US (95), China (72), India (33), Great Britain (16), Italy (13), South Korea (12), Spain (12), and Singapore (7)-- but not in breadth of use (5 out of 6)

Policy: The existence of a national initiative on robotics was associated with that country deploying a larger number of robots and for more socioeconomic work domains

Responsible Innovation: The resulting model of diffusion of innovation during disasters indicates need to increase availability of robots with established reliability and high suitability for existing use cases, not invent new robots

Ethics: There were 59 reports of ethical concerns: violates regulations (11), loss of privacy (10), fear of job replacement (9), unproven claims of effectiveness (9), lack of regulations (8), unwarranted surveillance (7), professional ethics (5)

Robot morphology: Almost as many aerial systems (117) were used as ground robots/automation (219), with the large majority non-anthropomorphic and wheeled; though future opportunities for increased manipulation (27) capable of physical HRI (19)

Use cases: The largest use cases were quarantine enforcement (45) and disinfection of public spaces (34) by Public Safety and disinfecting point of care (26) in Clinical Care, but a total of 85 robots were used for some form of delivery in every sociotechnical work domain except Public Safety

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