The role of 'urban living labs' in real-world testing RAS

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INTRODUCTION

In the context of contemporary urbanism & the Covid-19 pandemic, there is mounting interest in re-shaping city infrastructures, services & aspects of social life through advances in RAS [1-8]. Cities are being encouraged to open up public spaces for RAS real-world testing [3, 5-8]. Set against existing regulatory frameworks, experimental RAS Urban Living Labs (RAS- ULL) are an explicit form of intervention to trial, de-risk & improve innovations, build public support & appraise this new phase of urban restructuring [2].

Getty Images

URBAN LIVING LABS [9]

Urban test beds are 'more open & complex, less predictable & [human-machinic interactions] are less controlled' [2] compared to the laboratory. Creating these spaces & conditions raises critical challenges for urban decision-makers [2,5,8]. RAS infrastructures are expensive & technical, trust, safety & ethical challenges abound. Decisions will need to be made about the granting of licences & selective changes in regulation. New actor collaborations will emerge to undertake & learn from experiments. The wider public will need to be actively involved in understanding the purposes and potential of testing, as well as how experimental findings will be used [2].

- *Experimentation -* Testing new technologies, solutions & policies in real-world conditions, often in highly visibly ways.
- *Participation & user involvement -* Co-designing, collaboration & engagement with many stakeholders is central to the experimental approach.
- *Evaluation of actions & impact -* Systemic processes of evaluation to facilitate learning & upscaling.

RESEARCH DESIGN

To develop the evidence base that can support RAS-ULLs as a means for 'responsible urban innovation' [4], a systematic, internationally comparative (Japan, USA, UK) analytical approach is being used to examine;

(i)   the design & enabling conditions for RAS-ULLs,
(ii) processes of RAS-ULL implementation,
(iii) how these interventions reshape and augment city infrastructures & services, societal practices & urban governance.

Focus: (i) service robots, (ii) delivery robots & (iii) maintenance robots in semi/public realm. Exemplar case study selection ongoing through documentary review & 50 hour-long semi-structured interviews being conducted with policymakers, robotics firms, researchers. RAS-ULL site tours & observations will follow & all data will be thematically analysed.

ANTICIPATED RESULTS

- Different social, technical and political contexts create conditions for, limit & lead to tensions around urban robotic experimentation.
- Necessary coevolution of spatial planning, urban regulation, urban design and human-robotic interaction in the future 'infrastructuralisation' of robotically augmented cities.
- Need to link national priorities for future cities to pressing urban issues, to responsibly create a social context for RAS applications in contemporary cities.

REFERENCES

1 Macrorie et al. (2019) Urban Geography
2 Marvin et al. (2018) UK-RAS Network White Paper
3 Yang and Reuter (2020) World Economic Forum online
4 Nagenborg (2018) Ethics & Information Technology
5 While et al. (Accepted 2020) Urban Studies. ISSN 0042-0980
6 Tiddi et al. (2019) Int. Journal of Social Robotics
7 Lloyd's Register Foundation (2016) Report: 2016.1
8 Government Office for Science (2017) Tech & Innovation Futures.
9 Marvin et al. (Eds)(2018) Urban Living Labs: Experimenting with city futures. New York: Routledge.