Seven Wicked(ish) Problems of Regulating Autonomous Systems

School of Sociology, Politics and International Studies (SPAIS) I University of Bristol

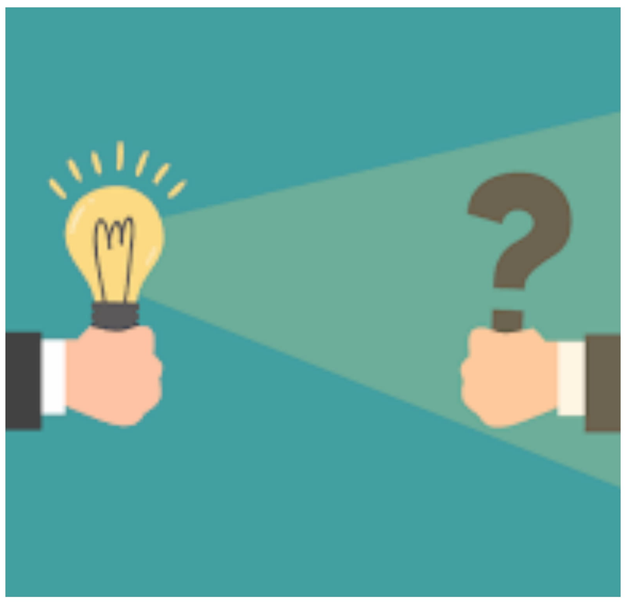
John Downer

Peter Winter

Engineering and Physical Sciences Research Council

UKRI Trustworthy Autonomous Systems Hub

Regulating Autonomous Systems



- The rapid development of new Autonomous Systems (AS) in a range of technological domains raises complex regulatory questions.
- We argue that some of these questions have properties akin to what are sometimes called '**wicked problems**', in that they pose dilemmas with no objectively optimal solution.

Seven Wicked(ish) Problems

1. The 'Borders of Autonomy' problem
2. The 'Sufficient Safety' problem
3. The 'Proof of Safety' problem
4. The 'Evolving Functionality' problem
5. The 'Public Interaction' problem
6. The 'Liability and Blame' problem
7. The 'Perverse Consequences' problem

The 'Sufficient Safety' Problem

How safe should autonomous systems be?

Take, for example, an autonomous vehicle. Should it be:

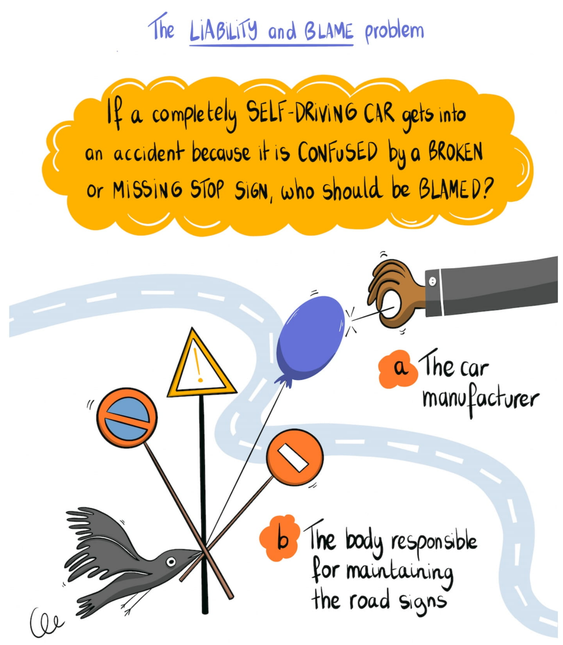
- *As safe as an average human driver?*
- *As safe as an 'expert' human driver?*
- *As safe as is conventionally required of safety-critical technologies?*

The 'Liability and Blame' Problem

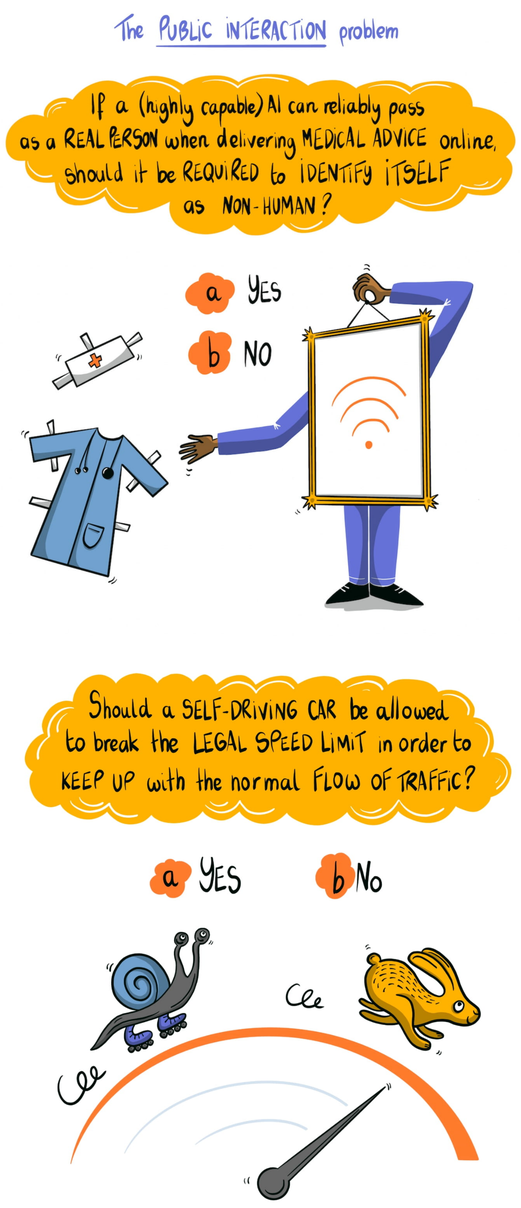
Who should be held liable when autonomous systems cause accidents?

- *Their owner?*
- *Their designer?*
- *Their regulator?*
- *Another party?*

Autonomous systems raise challenging questions about agency and responsibility.



The 'Public Interaction' Problem



How should autonomous systems interact with the public?

AS are designed to replace human operators and integrate into human societies, but people treat other people differently than they treat machines. Each have distinct obligations.

- *Should AS be required to identify themselves as non-human?*
- *Should people be required to treat AS in the same way as they would people? (e.g. to 'give way' at road junctions.)*
- *Should AS be allowed to break rules that humans conventionally ignore? (e.g. exceed the speed limit to keep up with traffic)*

Discussion

Can we 'fix' these problems?

- To differing extents each of these problems poses questions that can be clearly stated, but to which there can be no perfect engineering answer.
- As such, each require regulators (and, by proxy, society at large) to make consequential but subjective judgements about the governance of autonomous systems.
- By identifying and unpacking some of these problems, we hope to inform the discourse through which regulators, and scholars of regulation, might begin to navigate these problems.

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