“Is that a good idea, Cyberdyne?”: Towards Regulating Autonomous Systems with Evolving Functionality

**Type of award**  PhD Research Studentship

**Department**  Computer Science

**Scholarship Details**  Minimum £15,285 p.a. (£15,609 in 2021/22) subject to confirmation of award.

**Duration**  3.5 years

**Eligibility**  Home (UK) and EU citizens who have confirmation of UK settlement or pre-settlement status under the EU Settlement Scheme.

**Start Date**  From July 2021

**PhD Topic Background/Description**

Autonomous driving systems pose acute regulatory challenges. These arise from a confluence of unique epistemological and policy requirements that characterize autonomous vehicles. To wit:

i. They are safety-critical systems, on which lives depend. Hence:
   a. It is important that their reliability be established prior to their widespread adoption.
   b. They require levels of reliability that cannot be established empirically (i.e. from testing) prior to their widespread adoption.

ii. Their software contains machine-learnt elements, the reliability of which cannot be validated formally by deductive analysis.

iii. They enjoy enough institutional support and momentum, that regulators cannot simply ban them outright.

iv. Their code and functionality are expected to rapidly and iteratively evolve on a schedule that makes constant re-certification impracticable.

We invite applications for a PhD candidate to study this regulatory problem from a combined social scientific and engineering perspective. The intention is to examine:

i. The way regulators are navigating these issues in practice: highlighting the values, priorities and socio-technical constraints that inform their choices.

ii. The extent to which, and reasons why, regulators in different jurisdictions are making different choices in this regard — unpacking the implicit politics of those differences and (in some cases) their settlement.

iii. The tensions that are arising in these deliberations between expert engineering and regulatory communities — examining their competing rationales, constraints, and priorities, and exploring any difficulties that arise from mutual miscommunications and misconstruals.

iv. The relationship between design and regulation — exploring ways in which regulation can constrain design choices, and design choices can facilitate regulation.
Research questions include:

- How are regulators making the rules that govern driverless cars?
- What is shaping those rules?
- How do engineers address them?
- What are the implications of those rules for autonomous systems, on one hand, and the actors who use them on the other?

URL for further information: https://tasfunctionality.bristol.ac.uk/

Further Particulars

Candidate Requirements

Applicants must hold/achieve a minimum of a Masters degree (or international equivalent) in a relevant discipline. Applicants without a Masters qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

Basic skills and knowledge required:

- **Essential:**
  - Excellent analytical skills with a background understanding in one or more of the following:
    - Autonomous vehicles
    - Regulation / regulatory challenges
    - Engineering
    - Social science

- **Desirable:**
  - Experience of interdisciplinary working

Informal enquiries

For questions about the research topic please contact Prof Kerstin Eder at kerstin.eder@bristol.ac.uk or Dr John Downer at john.downer@bristol.ac.uk

For questions about eligibility and the application process please contact SCEEM Postgraduate Research Admissions sceem-pgr-admissions@bristol.ac.uk

Application Details

Prior to submitting your application, please contact the academic listed to discuss your research proposal and see if it aligns with their current research. No indication of an offer can be made until we receive your completed application.

To apply for this studentship, submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Computer Science Department” and specify the title of the scholarship in the “other” box below along with the name of the supervisor. In addition to the documents requested as part of the online application process, applicants should submit a research proposal (maximum two sides of A4) outlining how they would approach the topic. This should include a brief background, clear research question(s) and proposed methodology.

Interested candidates should apply as soon as possible. Applications from self-funded non-UK students are also welcome.