Title: Hybrid Autonomous Systems

Type of award: PhD Research Studentship

Department: Engineering

Scholarship Details: Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1st September 2018) PhD tuition fees and a tax-free stipend at the current RCUK rate (£14,777 in 2018/19) plus £2,000 per year stipend enhancement. EU nationals resident in the EU may also apply.

Duration: 4 years

Eligibility: Home/EU applicants only

Starting Date: 17 September 2018

PhD Topic Background/Description
The Thales-Bristol Partnership on Hybrid Autonomous Systems Engineering (T-B PHASE), an EPSRC / Thales Partnership for Prosperity project, is studying hybrid autonomous systems, meaning those that are not confined to closed environments but rather interface with the real world, its dynamic uncertainty, and particularly humans.

The PhD will be held in the FARSCOPE CDT. Instead of following an exact programme of work, the project will be co-created during the initial training year by the student and the T-B PHASE team. It should align with one of the partnership challenges:

- Distributed decision-making: how do we engineer, deploy and support systems without a central decision-making authority? How can the interaction of those systems be managed? How do we consider emergent behaviour of the system as a whole?

- Cascade failure: how do we predict how failures affect other parts of large systems? How do we prevent knock-on effects in which local failures lead to large-scale problems? How can we confidently engineer systems that are strongly interconnected?

- Life course autonomy: how do we design systems to remain in service for decades? How do we account for changing demands, upgrades, and evolving user behaviour? How do we engineer something so our great-grandchildren can still make use of our work?

- Human factors: how can autonomous systems be operated by and with humans? How do we combine the untiring efficiency of machines with the creative resilience of humans? How will humans cope with a machine that surprises them with its capabilities?
These fundamental questions will be explored in the context of three use-cases, and the successful candidate will spend time embedded within appropriate Thales business units to connect their work to these contexts:

- Traffic management for small unmanned air vehicles (“drones”)
- Future railway traffic management and signalling
- Semi-autonomous and robotic search and rescue

Further Particulars
http://www.bristol.ac.uk/engineering/research/t-bphase and http://farscope.bris.ac.uk/

Candidate Requirements
We are looking for an enthusiastic student with either a First or high 2:1 Honours degree in Engineering, Computer Science, Mathematics, Robotics or any other relevant subject.

Strong numerical, computing and analytical skills in mathematical modelling are essential. Experience would be beneficial in one or more of: multi-agent systems; autonomous decision-making; large-scale simulation; human-robot interaction; human-machine interaction; human-computer interactions. Likewise, experience in any of the three use cases, or of any other applications of autonomous systems, would be advantageous, especially with industrial context and/or the employment of a systems approach to problem solving.

Informal enquiries
For informal enquiries please contact Prof Arthur Richards arthur.richards@bristol.ac.uk
For general enquiries, please email came-pgr@bristol.ac.uk

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

Applicants should select “PhD in Robotics and Autonomous Systems” as their programme and clearly indicate “T-B PHASE Hybrid Autonomy Studentship” as their funding source in the Funding section.

Shortlisted candidates will be given a telephone interview in early May with the supervisors and industrial sponsor. There will also be an opportunity to visit for an interview in person if candidates are available.

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