

University of Bristol: PhD studentship in Augmented Reality

Augmented Reality for Information Visualisation in Fusion plant monitoring and operations

Start date: October 2018

Applications are invited for a 3.5-year PhD studentship to carry out research into augmented reality (AR) for visualisation and manipulation of digital information within fusion plant monitoring and operations. It will include the development of a proof-of-principle demonstrator linking AR with building information models (BIMs) to support both manual and remote operations. The research will involve close collaboration and secondment to UKAEA Remote Applications in Challenging Environments (RACE) for 6 or more months. Applicants should have a first-class or high upper-second class degree (or equivalent) in Computer Science or relevant engineering discipline. Applications from candidates with knowledge of and/or experience with computer vision, visual SLAM, tracking, HCI and/or augmented reality are particularly welcome. The studentship is funded by the EPSRC and UKAEA RACE. To be eligible for the full studentship, applicants must have no restrictions on how long they can stay in the UK and have been ordinarily resident in the UK for at least 3 years prior to the start of the studentship. Full details of eligibility requirements can be found on the EPSRC website <https://www.epsrc.ac.uk/skills/students/help/eligibility/>. For further information please contact Dr Andrew Calway via email: Andrew.Calway@bristol.ac.uk.

Further information

Fusion power plants will constitute large complex facilities, involving huge amounts of inter-related and dependent components and infrastructure. Efficient and robust collection and processing of this data is critical to effective design, build, maintenance, operation and monitoring. Sophisticated data containers in the form of building information models (BIMs) exist to facilitate this, but the associated software tools are limited in terms of their ability to relate the data to the physical world and live scenarios.

Augmented reality (AR) allows virtual content to be viewed and manipulated in the context of physical surroundings via platforms such as tablets or head mounted displays (HMDs). It offers an opportunity to provide a link between BIM data and the real world, enabling, for example, the display of complex information alongside and in the context of the physical space. This has the potential to improve radically the use of data for both remote and manual operations on any future fusion power plant, increasing efficiency and securing greater assurance in areas such as safety and quality control.

The studentship will involve research into how AR can be used for the fusion power industry. It will map out the challenges in realising the visualisation and manipulation of BIM data in live scenarios and detailing the potential gains for the industry. It will also involve developing a proof-of-principle demonstrator, illustrating the benefits of linking BIM data for example scenarios. It will be developed in close collaboration with RACE. The research will focus on the complete processing and delivery pipeline, including localisation, physical mapping, (multi) user interaction, display and data manipulation and storage. The studentship will be jointly supervised by Dr Andrew Calway (tracking, SLAM and AR), Prof Tom Scott (nuclear monitoring and radiation mapping) and Dr Kirsten Cater (HCI and human factors).