Title: Rapid digitisation of early-stage prototypes and physical to digital synchronisation in product design

Type of award PhD Research Studentship

Department Mechanical Engineering

Details Minimum £15,009 in 2019/20 subject to confirmation of funding

Duration 3.5 years

Eligibility Home/UK only

Start date From January 2020

PhD Topic Background/Description

Summary: This project will investigate processes and technologies to capture the form and behaviour of physical prototypes and generate synchronised digital representations.

The project is anticipated to include, but is not limited to:

▪ Technologies and processes to capture physical, kinematic, and dynamic prototypes, digitise form and behaviour, and detect macro- and micro-scale changes.

▪ Digital models and representation methods for physical prototypes, including data structures, data compatibility, and version control.

▪ Investigation of how prototype digitisation may best be used to accelerate prototyping processes, better support design, reduce cost, and reduce waste.

Context: The divide between the digital and physical domains in design are shrinking, where integrating the power of the digital world with the tangibility of the physical has created advanced and highly capable products. Many radical, cutting-edge technologies have emerged; including the ongoing VR and AR revolution, A.I. and data-driven physical systems (i.e. self-driving cars), and virtual assistants and analytics encroaching further into the physical world.

Seamless digital / physical integration often fails to transition into the processes that create such revolutionary products, particularly during prototyping, leaving design itself without the proven benefits that cutting-edge products have enjoyed. Prototyping is often a manual, skilled process, with frequent iterations between back and forward between digital and physical models of different fidelities, each tested and updated as the product develops. This process costs time and money and negates many of the emergent benefits that digital/physical integration can create.
**Team:** The successful applicant will work within a £1.6M EPSRC-funded project. Alongside 7 researchers and 4 academics they will work as part of a multi-disciplinary team, with work to-date including real-time scanning of prototypes, augmented/virtual reality, metal AM, data-driven design, generative design, and digital twinning. Supporting the project are several industry partners, providing use-cases and first-hand evaluation.

URL for further information:  [www.dmf-lab.co.uk](http://www.dmf-lab.co.uk)

**Candidate Requirements**
We are looking for an enthusiastic student with a Master’s degree. This project would suit a recent graduate in Engineering or Science with an interest in engineering design, modelling and simulation. It is likely that this project will require a mix of computational / modelling work, techniques such as photogrammetry and data analysis.

**Scholarship Details**
Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to application) PhD tuition fees, and a tax-free stipend at the current RCUK rate (£15,009 in 2019/20) subject to confirmation of funding.

**Informal enquiries**
Please contact Dr Chris Snider ([chris.snider@bristol.ac.uk](mailto:chris.snider@bristol.ac.uk)) and Prof. Ben Hicks ([ben.hicks@bristol.ac.uk](mailto:ben.hicks@bristol.ac.uk))

For general enquiries, please email [came-pgr-admissions@bristol.ac.uk](mailto:came-pgr-admissions@bristol.ac.uk)

**Application Details**
To apply for this studentship submit a PhD application using our [online application system](http://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 Mechanical Engineering Department” and specify the title of the scholarship in the “other” box below and the name of the supervisor, Dr Chris Snider.

[Apply now](http://www.bristol.ac.uk/pg-howtoapply)