Title: Rapid hybrid manufacture of prototypes and digital to physical 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 methods and systems to rapidly generate and alter physical models to synchronise with digital versions.

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

- Integration of additive, subtractive, and sculpting technologies into the next generation of rapid manufacture systems for prototyping.
- Technologies for macro- and micro-scale editing of existing prototypes.
- Investigation of technologies for digital/physical synchronisation.
- Investigation of methods to accelerate prototyping processes, better support design processes, reduce cost, and reduce waste.
- Process planning for new AM technologies and alignment with prototyping requirements.

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

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 design, manufacturing and associated technologies, and some experience in Additive Manufacture. In addition to practical implementation of the proposed method(s) some computational / modelling work will be required using tools such as Autodesk Fusion, Blender, Grass Hopper and Matlab.

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) and Prof. Ben Hicks (ben.hicks@bristol.ac.uk)

For general enquiries, please email came-pgr-admissions@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]

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.

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