Engineering and Physical Sciences Research Council Doctoral Landscape Award

PROJECT TITLE: Sustainable 3D Printing construction

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Project details: Traditional construction is responsible for generating 27% of global CO2. The UK government has set a clear target of achieving net-zero greenhouse gas emissions by 2050. 3D printing construction has emerged as a promising solution, offering advantages such as reduced labour costs, accelerated construction timelines, lower carbon emissions, and a safer building environment. However, current 3D printed buildings and concrete structures are based on a layer-by-layer process. The adhesive force between adjacent layers is limited, resulting in limited structural strength of the fabricated structures. T

o overcome this weakness, this project proposes using interlaced printing strategies for 3D printing concrete. The rheology of concrete will be studied and optimised for 3D printing interlaced structures. Constitutive and simulation models of concrete will be established, and mechanics analysis of interlaced structures will be conducted.

We will collaborate with Bina Robotics Ltd, Mimicrete Ltd, Additive Manufacturing UK, ABB Ltd, Create Education Ltd, Net Zero Projects Ltd to achieve the objectives.

Project Specific requirements: NA

Potential PhD programme of study: PhD in Engineering

Department: Engineering

Location: Harrison Building, Streatham Campus

Please direct project specific enquiries to: Dr Jingchao Jiang j.jiang2@exeter.ac.uk

Please ensure you read the entry requirements of programme to which you are applying.

To apply for this project please click here.