Research Associate in Structural Design

The Department of Civil, Environmental and Geomatic Engineering (CEGE) at University College London is inviting applications for the post of Research Associate in Structural Design to work on the EPSRC-funded research project BIM BAMBOO[1].

Nowadays steel, cement and aluminium production accounts for almost 20% of all global industrial carbon emissions and paradoxically, bamboo, an abundant, sustainable, ready-made, high-strength fibre reinforced composite structural hollow section has been largely ignored and stigmatised as a temporary, non-engineered, low-quality alternative to steel and concrete. The objective of this project is to develop a Building Information Modelling (BIM) framework for whole bamboo culms to support a new high-tech, low-energy design approach based on managing, as opposed to forcibly eliminating, the inherent variability of a natural structural element. This framework will incorporate the related principles of Design for Manufacture and Assembly (DfMA) and will rely on modern 3D scanning, digital modelling and robotic fabrication technologies.

Duties and Responsibilities

The successful applicant will be responsible for developing the protocols to acquire and generate the digital data required to integrate bamboo culms into a design workflow incorporating geometric modelling, structural (Finite Element) analysis and robotic fabrication (CAD–FEA–CAM). The post-holder will be in charge of planning, commissioning and operating the experimental set-up of a KUKA KR Agilus robot to support the development of these protocols.

Additional duties will include: i) publication of journal and conference papers, ii) build and maintain links with external partners; iii) contribute to the supervision of MSc/PhD students

Key Requirements

- PhD (or equivalent experience) in Structural Engineering, Architecture or related field
- Strong programming skills (Python, C++, etc.)
- Good working knowledge of geometric modelling (Rhino/Grasshopper, Revit, etc.), structural analysis (GSA, Robot, etc.) and scientific analysis software (Matlab, etc.)
- Knowledge of Open BIM protocols
- Prior experience in robotic control and CNC fabrication (desirable but not essential)
- Experience working in, or collaborating with, industry (desirable but not essential)
- Excellent communication and time-management skills

The duration of the project is two years, appointments will be made at Grade 7 on UCL salary scale and the expected start date is early summer 2015.

For further details please contact Dr Rodolfo Lorenzo, r.lorenzo@ucl.ac.uk, +44 (0) 20 3108 4084

---

[1] http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/M017702/1