

SEAHA

CENTRE FOR DOCTORAL TRAINING IN
SCIENCE AND ENGINEERING IN
ARTS HERITAGE AND ARCHAEOLOGY

SEAHA Studentship: Strain modelling in historical tapestries

The studentship project will investigate cutting edge real-time in-situ tri-axial strain monitoring sensors to provide data to inform analytical modelling of tapestries using Finite Elements and explicit mathematical formulations together with modern Dynamic Equilibrium methods used in fabric simulations. Controlled laboratory testing will be carried out to develop an initial calibration of the measuring technique and to develop and calibrate the analytical model.

This exciting project will provide the successful candidate with a wide range of engineering, modelling, material science, environmental science as well as professional skills to develop their future career in a wide variety of multidisciplinary environments ranging from academia and conservation to engineering consultancy. The successful candidate will have a good first degree with a strong analytical modelling background in a relevant discipline such as engineering, physics or material science but also conservation, heritage science or architecture.

The focus of the project will be on the historical textile tapestry collections at Hampton Court Palace. Their exposure to environmental risks may result in structural deterioration potentially leading to loss of affected areas. The project will seek to understand how humidity and temperature influence the stress and strain distribution in hanging historic textiles to inform their preservation.

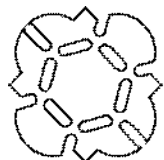
The following concrete research questions are of interest:

- (i) What is the relationship between the environmental changes in humidity and temperature and strain in historic tapestries?
- (ii) What are the most appropriate analytical techniques to model this relationship?
- (iii) Can model-based simulations inform the optimum environmental conditions for the protection of historic tapestries?
- (iv) How can the analytical model inform current tapestry conservation methods, such as 'structural stitching'?

This project is part of the EPSRC Centre for Doctoral Training in Science and Engineering in Arts, Heritage and Archaeology at University College London, University of Oxford and University of Brighton (www.seaha-cdt.ac.uk), in collaboration with Historic Royal Palaces and IBM T.J. Watson Research Center. Funded by the Engineering and Physical Sciences Research Council (EPSRC) through the Centre for Doctoral Training and co-funded by Historic Royal Palaces, the four year doctoral research programme will be supervised jointly by UCL Department of Civil, Environmental & Geomatic Engineering (www.cege.ucl.ac.uk/), UCL Institute for Sustainable Heritage (<http://www.bartlett.ucl.ac.uk/heritage>), Historic Royal Palaces (<http://www.hrp.org.uk/conservation>), and IBM T.J. Watson Research Center (<http://www.research.ibm.com/labs/watson>). For further details contact Dr. Rodolfo Lorenzo, r.lorenzo@ucl.ac.uk.

As a SEAHA student, you will have unparalleled access to research infrastructure and expertise across three universities and almost 50 heritage, research and industrial partners. In addition to the university doctoral training requirements, SEAHA students take part in an exciting range of cohort activities, ranging from residential events and group projects, to conferences and careers events. Please visit the SEAHA website (www.seaha-cdt.ac.uk) for details.

SEAHA is a Doctoral Training Centre at University College London (UCL), University of Oxford, and University of Brighton. SEAHA is funded by the Engineering and Physical Sciences Research Council (EPSRC).



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The SEAHA Studentship will cover home fees and a stipend of up to a maximum of £16,726 per year (current rate) for eligible applicants (<http://www.seaha-cdt.ac.uk/opportunities/eligibility-criteria/>), and a substantial budget for research, travel, and cohort activities.

The application should include:

- A covering letter clearly stating your motivation
- The UCL graduate application form which can be downloaded via UCL's web site: <http://www.ucl.ac.uk/prospective-students/graduate/apply/apply-now/ucl-graduate-application-form.pdf>
- Two academic references (or one academic and one professional reference if applicable)
- A copy of your degree certificate(s) and transcript(s) of degree(s)
- Proof of meeting the UCL English language proficiency requirements where necessary. For SEAHA candidates, an advanced level certificate is normally required (details of English language proficiency requirements can be found at <http://www.ucl.ac.uk/prospective-students/graduate/apply/english-language/index>)
- A short research proposal (max. 2000 words) written by taking into consideration the above research questions

The award will be subject to Grant Agreement between UCL, Historic Royal Palaces and IBM T.J. Watson Research Center.

The applications should not be submitted by UCL online admissions system. Instead, they should be sent directly to:

SEAHA Manager
manager@seaha-cdt.ac.uk
UCL Institute for Sustainable Heritage
Faculty of the Built Environment
UCL
14 Upper Woburn Place
London WC1E 0NN

UCL Taking Action For Equality.

Application deadline: 1 March 2015.

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