



SEAHA Studentship: Strain modelling in historical tapestries

Tapestries are among the most valuable cultural heritage in Europe. They represent an art form in its own right and provide unique insight on the life and culture of the mediaeval and Renaissance period. Exposure of these culturally valuable objects to environmental risks results in structural deterioration potentially leading to the loss of affected areas. This scholarship would explore how humidity and temperature influence the stress and strain distribution in large hanging historic textiles to inform their preservation.

The project, based at UCL Civil Engineering Department in collaboration with Historic Royal Palaces and IBM T.J. Watson Research Center, will focus on the historical textile tapestry collections at Hampton Court Palace to investigate advanced methods to detect and foresee such deterioration, hence developing methods for preventing damage and evaluate best conservation treatment strategies. The project builds on a long term environmental monitoring campaign at Hampton Court Palace and on experimental work on accelerated ageing of tapestry fabric, carried out by members of the team.

The successful candidate will have the opportunity:

- To conduct combined environmental/gravity testing in a new state of the art chamber, to investigate the relationship between the state of stress/strain in the threads and real samples of historic tapestry and the environmental conditions.
- To develop analytics to interrogate real-time data acquired from innovative IBM tri-axial strain sensors installed on tapestries
- To develop advance numerical modelling at the meso and macro scale to investigate the moisture/gravity loading interaction at the scale of the yarn, thread and up to tapestry panel.
- To develop testing and simulations protocols for repair techniques to determine their effectiveness and optimal selection in relation to different types of fabric and damage risk.

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.

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 Prof Dina D'Ayala (d.dayala@ucl.ac.uk).

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).



SEAHA

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

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.

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 and how the course will contribute to your career development
 - Your residency status and eligibility for funding according to the information provided <http://www.seaha-cdt.ac.uk/opportunities/eligibility-criteria/>, or how you intend to sponsor your studies if not eligible for funding
 - Your academic eligibility
- Names of two academic referees (or one academic and one professional if applicable)
- 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 be sent by email directly to:

SEAHA Manager
manager@seaha-cdt.ac.uk
UCL Institute for Sustainable Heritage

UCL Taking Action For Equality.

Application deadline: open until filled.