



Further Particulars:

Research Associate in Control

– Ref: 1636794

Job Title:	Research Associate – Control
Department:	Electronic and Electrical Engineering
Reports to	Professor Sarah Spurgeon
Grade:	Research Associate Grade 7 full-time (1 FTE), Point 29
Salary:	Starting salary: £34,056 including London Allowance of £2,980 per annum
Start Date:	The position is available from 1 April 2017 or as soon as possible thereafter for a period of 9 months

Appointment at Grade 7 is dependent upon having been awarded a PhD; if this is not the case, initial appointment will be at Research Assistant Grade 6B (salary £29,809 - £31,432 per annum) with payment at Grade 7 being backdated to the date of final submission of the PhD thesis (including corrections).

A PhD in a relevant subject is required.

Project Outline

Many toxic organic compounds contaminate soils and aquifers. In particular, the petroleum industry has been responsible for many oil leakages into soil. These contaminants can migrate into the subjacent aquifer. This mass transfer process may adversely affect different ecosystems as well as the animal life cycle. In critical conditions, human health can be affected. This is a particular problem in Mexico, which is the tenth biggest oil producer in the world. Although not water scarce when

viewed as a whole, unequal water distribution has led to significant water stress in parts of the country. As well as impacting adversely Mexico's growing population, distribution factors and increased competition for limited water resources could temper Mexico's potential for growth, particularly in the industrial and manufacturing sectors.

There are many soil treatments which focus on contaminant elimination from the solid phase. The problem of the treatment of ground and residual water, as well as contaminated soil with a high content of volatile organic compounds (VOCs) remains. Integral treatment of contaminated sites should address the solid phase as well as the elimination of contaminants from the aquifer and any VOCs. Optimization of any integrated treatment regime is a major problem. The underlying dynamics are very complex with nonlinear systems describing each of the subsystems involved. The scant availability of accurate mathematical models has limited the application of optimization techniques to the problem. This motivates applying robust control strategies as these accommodate uncertainties and perturbations in nonlinear systems.

This project has been funded as part of a Newton Institutional Links Award and is joint with the National Polytechnic Institute in Mexico City. The project will design automatic control strategies to optimize a laboratory scale ozonation system.

Research Associate in Control

Duties and Responsibilities

The main responsibility of the Research Associate will be to develop a strategy to observe unmeasurable states of the system and to design a control law based on system measurements and outputs from the designed observer. The following is indicative of the duties and responsibilities associated with this post:

- Analyse a given dynamic model of the ozonation system, performing open-loop simulation testing in matlab.
- Develop a state-observer and validate the performance in simulation.
- Design a robust output based controller and validate the performance in simulation tests.
- Be in charge of reporting on the progress of the project.
- Present the results at progress meetings.
- Publish research in leading journals and present it at national and international conferences.
- Contribute to the overall activities of the research team and department as required.
- Actively follow UCL policies including Equal Opportunities policies

As duties and responsibilities change, the job description will be reviewed and amended in consultation with the postholder who will carry out any other duties as are within the scope, spirit and purpose of the job as requested by the line manager or Head of Department/Division.

The post is to be held in the UCL Department of Electronic and Electrical Engineering. The project will be carried out in collaboration with academic and industrial partners in Mexico.

Qualification/Skills Required

- PhD in control engineering (essential).
- First degree in a relevant branch of engineering, mathematics or physical sciences (essential).
- Experience with controller and/or observer design for nonlinear and complex processes. (desirable)
- Proven capability in mathematical modelling, systems analysis and simulation is required (essential)
- Ability to analyse and write up data in the form of journal papers and reports (essential).
- Ability to organise and plan work effectively to meet deadlines (essential).

Personal

- Excellent interpersonal and communication skills, both verbal and written. (essential).
- Ability to present technical information effectively to a range of audiences (essential).
- Commitment to high quality research (essential).
- Ability to work collaboratively and as part of a team (essential).
- Commitment to UCL's policies eg equal opportunity, health and safety (essential).

About UCL and the Departments of Electronic and Electrical Engineering

University College London (UCL) was founded in 1826 as the third university in England, after Oxford and Cambridge. UCL is however the first university in England to admit students of any race, class or religion, and the first to welcome women on equal terms with men. UCL is now the largest comprehensive university in London with more than 4,000 academic and research staff in 72 departments. The main campus of UCL is located in central London, just a few minutes walking distance from British Museum, West-End and Thames River.

The Department of Electronic and Electrical Engineering at UCL was established by Professor Sir Ambrose Fleming in 1885 and has a very strong research culture, state-of-the-art research equipments and facilities, and a very rich history of many fundamental research achievements in electronic and electrical engineering. The Department currently hosts international renowned research groups in Communications and Information Systems; Photonics; Optical Networks; Sensors, Systems and Circuits; Electronic Materials and Devices. For more information about the department and our research achievements, please visit the website <http://www.ee.ucl.ac.uk>

Further information regarding UCL may be found at:

www.ucl.ac.uk/

Information about the departments may be found at:

www.ee.ucl.ac.uk

HOW TO APPLY

All applications should be submitted via UCL Online recruitment system at the following link:

<http://www.ucl.ac.uk/hr/jobs> and search for reference **1636794**

Interested applicants are encouraged to make Informal enquiries about the post to Professor Sarah Spurgeon at

s.spurgeon@ucl.ac.uk

If you experience any problems with the application process, please contact Vicky Coombes at v.coombes@ucl.ac.uk quoting reference **1636794**

Please do not send CV's direct.

UCL Taking Action for Equality