Job Description – Ref 1866611
iMIRACLI Early Stage Researcher
Department of Electronic and Electrical Engineering, University College London

The Department of Electronic and Electrical Engineering, University College London is seeking to appoint one high-calibre Early Stage Researcher (ESR) to join the Marie Skłodowska-Curie Innovative Training Network on ‘innovative Machine leaRning to constrain Aerosol-cloud CLimate Impacts - (iMIRACLI)’.

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<th>Position</th>
<th>Early Stage Researcher 'innovative Machine leaRning to constrain Aerosol-cloud CLimate Impacts - (iMIRACLI)</th>
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<td>Location:</td>
<td>UCL, London, with secondments to project partners in the EU</td>
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<td>Working Time:</td>
<td>Full Time (36.5 hours per week)</td>
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<td>Duration:</td>
<td>Fixed-Term (1st September 2020 – 31st August 2023)</td>
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<td>Salary:</td>
<td>Between £37,730 and £46,950 gross per annum at the current rate of exchange. These figures are before employer and employee deductions, including tax, national insurance and pension contributions, subject to the pension choices of the appointee. The level of salary is also subject to the family status of the appointee as to whether they qualify for a family allowance. Due to potential future changes in the Euro/Pound Sterling exchange rate over the period of the appointment, where amendments are required, corrective payments will be made. Salaries are not subject to either cost-of-living adjustments or increment progression, and are inclusive of London Allowance.</td>
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About iMIRACLI

Anthropogenic climate change is one of the most urgent problems facing mankind. To avoid dangerous levels of global warming, the UN Conference of Parties 2015 in Paris reached a historic agreement to keep global mean temperature rise “well below” 2°C above pre-industrial levels. Anthropogenic aerosols have most likely offset some of the greenhouse warming to date, particularly through their interaction with clouds, however, despite decades of intensive research, significant uncertainties in the magnitude of this cooling still persist.

Even though big datasets have been widely analysed to advance our understanding of aerosol-cloud climate interactions, many uncertainties remain and current methods are often inadequate. Artificial intelligence (AI) and machine learning, which are already revolutionising many areas of research, have not yet been fully applied in climate science – and scientists are not trained adequately. iMIRACLI proposes that merging of AI, machine learning and climate science will deliver a breakthrough in our understanding of the impact of aerosol-cloud interactions on climate.

Our innovative training plan will match each PhD student with supervisors from climate and data science backgrounds, as well as non-academic partners, across Europe and provide them with training in both state-of-the-art data and climate science techniques producing a new generation of climate data experts.
The Role

The ESR will be enrolled on the PhD programme at UCL’s EEE Department and will write his/her thesis on a topic related to **Algorithms for multimodal data-based inference and prediction for climate science applications**, supervised by Prof. Miguel Rodrigues at UCL and co-supervised by members of the other academic/industrial teams during the secondments. Further information about the PhD project is below:

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<th>Title: Algorithms for multimodal data-based inference and prediction for climate science applications</th>
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<td><strong>Objectives:</strong> This project will develop new multimodal deep learning algorithms that are able to capture the relationship between diverse data and image modalities – such as infrared image information, hyperspectral infrared sounding information or active remote sensing – in order to deliver relevant insights in outstanding climate science challenges such as aerosol-cloud-precipitation-climate interactions. The project will also develop robust deep learning algorithms that are able to deal with a number of issues arising in the climate science domain such as: i) uncertainty in the testing/training data, ii) different degrees of uncertainty in different data modalities, and iii) small data. The algorithms will also be applied to real data to determine historical auto-conversion rates from actual satellite observations. These novel observations are critical to evaluate the representation of precipitation.</td>
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<td><strong>Expected results:</strong></td>
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<td>• New multimodal deep learning algorithms</td>
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<td>• New machine learning approaches to deal with data uncertainty</td>
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<td>• New machine learning approaches to deal with small data</td>
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<td><strong>Planned secondment(s):</strong> 3 months at University of Leipzig, 3 months at the MetOffice InformaticsLab</td>
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The ESR’s PhD must be designed and conceived as an integral part of the overall iMIRACLI project. The successful candidate will be a team player, prepared to work closely with the Project’s senior staff and other ESRs.

This is an outstanding opportunity to be part of a network of leading scholars working on the state of the art in Data Science and Climate Science. In addition to PhD supervision, the successful candidate will benefit from a wide-ranging training programme, which will encompass:

a) Regular summer/winter schools pertaining to both, technical skills on topics in data science and climate science relevant to the scope of the iMIRACLI project, and a range of transferrable skills;
b) An overseas research secondment to one of the partner universities in the iMIRACLI consortium;
c) A secondment to a non-academic training partner;

The ESR will help organise and present their research at a major international conference on the themes of the iMIRACLI research programme.
Duties & Responsibilities

1. Undertake postgraduate research in support of the agreed doctoral research project.
2. Work closely with the academic supervisors to ensure the compatibility of the individual project with the overall goals of iMIRACLI.
3. Present and publish research to both academic and non-academic audiences.
4. Attend and participate in academic and non-academic conferences, events and seminars.
5. Actively participate in outreach activities and in promoting the Project's progress and events in social networks.
6. Attend and participate in all training events and supervisory meetings.
7. Be seconded to other network partners as necessary to fulfil the grant obligations.
8. Prepare progress reports and similar documents on research for funding bodies, as required.
9. Contribute to the delivery and management of the wider Programme, including attending and participating in programme committee meetings.

As job descriptions cannot be exhaustive, the ESR may be required to undertake other duties, which are broadly in line with the above duties responsibilities.

Person Specification

Essential

1. A good Undergraduate degree and a postgraduate Master's degree (or equivalent) in electronic or electrical engineering, computer science, mathematics or a physical sciences subject.
2. Highly proficient English language skills.
3. Ability to think logically, create solutions and make informed decisions.
4. Willingness to work collaboratively in a research environment.
5. Ability to travel and work across Europe.

Desirable

1. Excellent written and verbal communication, including presentation skills.
2. Excellent organisational skills, attention to detail and the ability to meet deadlines.
3. A strong commitment to your own continuous professional development.
Eligibility Requirements

All candidates must meet the following requirements to be considered for this post:

a) Early-Stage Researchers (ESRs) shall at the time of recruitment by the host organisation be in the first four years (full-time equivalent research experience) of their research careers and not yet have been awarded a doctoral degree. Full-time equivalent research experience is measured from the date when a researcher obtained the degree which would formally entitle him or her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher is recruited.

b) At the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the three years immediately prior to the recruitment date. Compulsory national service and/or short stays such as holidays are not taken into account.

How to apply
Applications must be submitted online to www.ucl.ac.uk/hr/jobs. Job Reference 1866611

Only two supporting document files can be submitted so please combine the required documents before uploading.

The application must include:

a) Curriculum vitae
b) Academic transcripts
c) Letter outlining your motivation, skills and fit for the programme (no more than 2 pages)
d) Three reference letters, one of whom should be from a recent academic supervisor. The referees must e-mail their recommendations directly to v.coombes@ucl.ac.uk.

Selection process
The selection and recruitment processes of the ESRs will be in accordance with the European Charter and Code of Conduct for the Recruitment of Researchers. The recruitment process will be open, transparent, impartial, equitable, and merit-based. There will be no overt/covert discrimination based on race, gender, sexual orientation, religion or belief, disability or age. To this end, the following selection criteria for the recruitment of the ESRs will be considered:

1) Curriculum vitae
2) Academic performance (diplomas, university transcripts, etc.)
3) Research and industrial experience
4) Awards and fellowships
5) Publications and patents
6) Research, leadership, and creativity potential
7) English knowledge
8) Other relevant items based on the specific candidate

The recruitment process will adhere to the guidelines described in the Grant Agreement of the iMIRACLI project. In particular, at the network’s level, the iMIRACLI training board will also be responsible for approving the short-listed applicants to ensure consistency across the network.

The applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a Skype interview.

Further Information

For more information about the post, please contact: v.coombes@ucl.ac.uk or m.rodrigues@ucl.ac.uk