



Fully-Funded Ph.D. Position on Edge-Cloud Computing

We are pleased to announce an exciting opportunity for a prospective Ph.D. student to join the School of Computer Science at University College Dublin (UCD). We seek highly motivated and talented individuals passionate about cutting-edge research in distributed systems. UCD is a leading Irish university with a global ranking of #171 (latest QS ranking). It is ranked #1 in Ireland and #87 worldwide for graduate employability, and the graduates from the School are in high demand by industry. As part of our dynamic research community, you will work with experienced faculty members, addressing critical challenges and developing innovative solutions to advance the field. Applicants with a Master's degree in Computer Science or related disciplines are encouraged to apply.

Research Topic: Sustainable Computing at Edge-Cloud Continuum

The "Sustainable Computing at the Edge-Cloud Continuum" research addresses the escalating data processing demands brought about by combining multi-cloud architectures and edge computing paradigms. This interdisciplinary study, encompassing computer networks, distributed systems, and machine learning, aims to seamlessly integrate and optimize resource utilization and workloads across edge servers, multi-cloud infrastructures, and IoT devices to achieve enhanced energy efficiency, reduced carbon footprint, and improved sustainability. Leveraging advanced techniques like dynamic workload allocation, energy-aware scheduling, and resource management, along with applying cutting-edge machine learning methodologies, the research explores sustainable computing paradigms that intricately balance performance, latency, and energy consumption within the edge-cloud continuum. The investigation includes delving into mobile edge computing, where computational resources are brought closer to users for faster and more efficient processing. Additionally, the study will focus on service orchestration for containerized services and serverless functions to automate resource allocation for efficient scaling and reduced energy consumption, all while promoting eco-friendly practices. By uniting knowledge from computer networks, distributed systems, and machine learning, this research aims to reform resource utilization and service management, creating an environmentally conscious technological ecosystem that paves the way for sustainable and resource-efficient solutions in the ever-evolving field of edge-cloud systems.

Supervisor: Dr. Hadi Tabatabaee Malazi (Hadi.TabatabaeeMalazi@ucd.ie)

Post Duration: 4 years

Expected Start Date: January 2024

Application deadline: Until the position is filled.

Qualifications and Requirements

Mandatory:

1. a. 2.1 grade (i.e., with a score higher than 60% or equivalent) in an undergraduate or postgraduate degree in computer science, maths, engineering, or similar technical discipline.
2. Strong programming skills in at least one of these programming languages: Python, Java, or C.
3. Excellent written and verbal communication skills.
4. Experience or knowledge about machine learning techniques, cloud computing, and computer networks.
5. Willingness and motivation to learn and experience new theoretical and technological areas.

Desired:

1. A master's degree in computer science or a closely related field.
2. Peer-reviewed academic publication(s).
3. Practical experience in simulation environments and ML libraries (e.g., CloudSim, OMNet++, NS3, MATLAB, TensorFlow)
4. Experience or knowledge of service containerization technologies (e.g., Docker, Kubernetes, Minikube)
5. Theoretical knowledge of game theory, graph theory, and optimization methods.

Principal Duties and Responsibilities

1. This is a research-focused position where the student will conduct a specified program of research supported by research training and development under the supervision and direction of the supervisor and where the student will: A) carry out an agreed research and work plan on the introduced research problem, working closely with UCD staff and other Ph.D. students from other projects in the School of Computer Science. B) Travel to meetings and conferences as required;
2. The student will complete modules in relevant topics (TBA) to a total of 30 credits as part of a structured Ph.D. in UCD.
3. Teaching assistant duties¹.
4. The student will ensure that all research is carried out per UCD requirements for ethical research and data management and that the Ph.D. is completed within the allocated period.

Benefits

- A full tuition fee waiver and a €19,000 annual (tax-free).
- Travel budget for conferences
- Equipment budget

How to apply

Applicants should send the following documents to Hadi.TabatabaeeMalazi@ucd.ie before the deadline.

1. A one-page cover letter describing how you meet the mandatory/desired requirements.
2. A detailed curriculum vitae (CV) including education history, programming skills and research projects/publications.
3. Scanned copies of relevant academic transcripts.
4. English Language Proficiency for non-native English speakers, in line with UCD requirements ([here](#))².

Selection Process and Criteria

Selection criteria outline the qualifications, skills, knowledge, and experience that the successful candidate would need to demonstrate for the successful discharge of the responsibilities of the post. Applications will be assessed based on how well candidates satisfy these criteria.

The selection process has two stages. Initial applications will be reviewed, and shortlisted candidates will be contacted to submit a research interest letter (describing the vision for a potential research project on the defined research topic) and two recommendation letters. Successful candidates from this stage will be invited for an interview. Only candidates passing a stage will be contacted.

Equality, Diversity, and Inclusion

UCD is committed to creating an inclusive environment where diversity is celebrated, and everyone is afforded equal opportunity. To that end, the university adheres to a range of equality, diversity, and inclusion policies. We encourage applicants to consult those policies [here](#)³. We welcome applications from everyone, including those who identify with any of the protected characteristics that are set out in our Equality, Diversity, and Inclusion policy.

More information about UCD Computer Science [structured Ph.D.](#) ⁴ and [Ph.D. Lifecycle](#) ⁵

¹ The student might be asked to travel to UCD's China campus in Beijing as a teaching assistant accompanying the supervisor. In that case, the subsistence allowance and travel tickets to China will be provided by UCD.

² <https://www.ucd.ie/registry/prospectivestudents/admissions/policiesandgeneralregulations/generalrequirements/minimumenglishlanguage/requirements/>

³ <https://www.ucd.ie/equality/>

⁴ <https://www.ucd.ie/cs/study/researchdegrees/expectationsonceadmittedstagesofaucdcsstructuredphd/>

⁵ <https://www.ucd.ie/graduatestudies/researchstudenthub/phdlifecycle/>