



Post Specification

Post Title:	Postdoctoral Research Fellow in Augmenting and Evaluating the Physical and Digital Infrastructure for CCAM deployment (Augmented CCAM)
Post Status:	Specific Purpose Contract Full-time
Research Group / Department / School:	School of Engineering, Trinity College Dublin, University of Dublin
Location:	School of Engineering, Trinity College Dublin, University of Dublin
Reports to:	Prof. Bidisha Ghosh (PI) and Prof. Arman Farhang (Co-PI)
Salary:	The appointment will be made no higher than Research Fellow Level 1 point 5 per annum, or up to €44,000 per annum (depending on experience)
Hours of Work:	Full-time
Closing Date:	12 Noon (Irish Standard Time), 1 st November 2022

Post Summary

The School of Engineering, Trinity College Dublin, the University of Dublin seeks to appoint a Postdoctoral Research Fellow in Augmenting and Evaluating the Physical and Digital Infrastructure for CCAM deployment (Augmented CCAM).

The successful candidate will support research in the realm of connected vehicles, in the context of the Augmented CCAM project that is funded by European Commission under the Horizon Europe Programme. The successful candidate will be working with a vibrant team of researchers to drive world-class research around the development of advanced solutions for the automated vehicles of the future in new application areas such as V2X and automated driving. The project consortium includes 27 partners from both industry and academia from Europe and UK.

The present project aims to understand, harmonise, and evaluate in an augmented manner, adapted and novel support concepts of Physical, Digital and Communication infrastructure

(PDI), to advance its readiness for large scale deployment of on Connected, Cooperative & Automated Mobility (CCAM) solutions for all.

In Year 2050, vehicles are expected to have 100% real-time connectivity on the relevant road network, in order to allow the greatest possible extension of Automated Vehicles (AVs) Operational Design Domain (ODD) and, at the same time, the maximum benefits for all other connected vehicles, and, finally, through the use of a sharing and actuation enabling service framework, that will connect all road users and will deploy AI sophisticated techniques, the possibility to achieve a holistic situational awareness of the network, thus being able to apply granular traffic management strategies on vehicle and road user level.

Candidates for the Postdoctoral position must have completed all the requirements for a PhD in Mechanical, Electrical, Computer or Transportation Engineering or a related field. Research experience in traffic modelling and simulation is required. A strong background in computer programming (languages: python and Java/Javascript/C#/C/C++ necessary), machine learning/deep learning, and network optimisation is highly desirable. Active interest in computer simulation and IoT is recommended.

The successful candidate should have extensive experience and expertise in mathematical modelling, analysis, and signal processing with a particular focus on the wireless communications design, supported by strong publication track record. Experience and expertise in testbed experimentation are desirable.

The successful candidate will be supported to present their research findings at major international conferences, workshops, and seminars within the scope of the Augmented CCAM project and establish useful contacts with other researchers.

The appointment provides great opportunities to work closely with the network of academic and industrial project partners who are among the world-leading research teams in Europe. While majority of the time is dedicated to the specific research being conducted by the successful candidate, the appointment may involve co-supervision of postgraduate students at both PhD and MSc levels. In addition to the academic experience, the abovementioned collaborations will prepare the successful candidate for being qualified for further opportunities in both academia and industry.

Standard Duties and Responsibilities of the Post

- Undertake world-class research in automated driving, traffic simulation and V2X
- Design, develop and validate the proposed solutions in the available test sites provided in the project.
- Conduct individual and collaborative research to the highest ethical standards.
- Publish and present research results from the project in top-tier transportation and engineering journals and conferences.
- Work closely with the PIs and the research team of the Augmented CCAM project to ensure that the progress of the project is in line with the objectives of the research programme.
- Attend all the project meetings.
- Present and publish research outputs to both academic and non-academic audiences.
- Participate in internal/external networks for the exchange of information and to form relationships for future research collaborations.
- Contribute to the identification of external funding sources and assist in preparation of grant proposals.
- Carry out teaching activities on relevant topics up to 12 hrs per semester

Funding Information

The position is funded by the European Commission under the Horizon Europe Programme.

Person Specification

The successful candidate will have broad knowledge and experience in signal processing, wireless communications, traffic modelling and simulations. The successful candidate is expected to:

- Have excellent interpersonal skills
- Be willing to work collaboratively in a research environment
- Have the ability to think logically, create solutions and make informed decisions
- Have a strong commitment to their own continuous professional development
- Be highly organised in their work, with an ability to work remotely if necessary
- Show integrity and professionalism in the course of their work

Qualifications

- Candidates appointed to this role must have completed all the requirements for a PhD in Mechanical, Electrical, Computer or Transportation Engineering or a related field.

Knowledge & Experience (Essential & Desirable)

Essential

- Excellent background in communication theory, signal processing, machine learning/deep learning, network optimisation, and algorithm development and design
- Active interest in computer simulations and the Internet of things (IoT) is desirable
- In depth understanding of transport modelling and research experience in assisted driving, autonomous driving, traffic simulation and traffic data and sensors.
- Experience in VISSIM/VISUM or SUMO traffic simulation software
- Publication track record in leading Elsevier/IEEE journals and conferences, in the areas of vehicular technology, IoT, intelligent transportation
- Experience in presenting research findings at an international level
- Proven ability to prioritise workload and the ability to meet deadlines
- Excellent problem-solving abilities
- Enthusiastic and structured approach to research and development
- Ability to work both independently and as a team member
- Solid written and oral communications skills

Desirable

- Experience with testbeds and infrastructure for connected vehicles
- Experience in the IoT and sensor fusion
- Experience in preparation of research grant proposals
- Mentoring junior team members

Skills & Competencies

- Strong mathematical, analytical and programming skills
- Excellent written and oral proficiency in English (essential)
- Good communication and interpersonal skills both written and verbal
- Proven ability to prioritise workload and work to exacting deadlines

- Flexible and adaptable in responding to stakeholder needs
- Enthusiastic and structured approach to research and development
- Excellent problem-solving abilities
- Desire to learn about new products, technologies and keep abreast of new product technical and research developments

Application Procedure

Applications must be sent by e-mail to Prof Bidisha Ghosh, bghosh@tcd.ie and Prof Arman Farhang, arman.farhang@tcd.ie, in a single PDF file with the title “PhD_Application_{Applicant’s surname}”.

Applications should include:

1. A cover letter explaining the applicant’s motivation and interest to undertake the role. Any relevant background and/or experience needs to be mentioned.
2. A Curriculum Vitae that includes the applicant’s educational qualifications and any scientific publications and achievements.
3. Two academic reference letters.

Further Information for Applicants

URL Link to the Department	https://www.tcd.ie/eleceng/
URL Link to Human Resources	https://www.tcd.ie/hr/

Research Environment

Prof. Bidisha Ghosh is the Principal Investigator of the Augmented CCAM project. She is the lead of the QUANT research group which constitutes a multidisciplinary team of engineers, computer scientists and physicists researching on a multitude of projects on transportation, traffic emission, renewable energy and remote sensing.

<https://www.tcd.ie/civileng/QUANT/>

Prof. Farhang is the Co- Principal Investigator of the Augmented CCAM project. Both PIs are Research Investigators in the world-leading SFI research centre CONNECT (Research Centre for Future Networks and Communications) which further creates a dynamic research environment for his team with a large amount of exposure to both industry and academia. Prof. Farhang's research team is focusing on design of novel physical layer technologies and advanced waveforms/modulation schemes, low-latency and scalability to the wireless networks of the future along with developing new signal processing algorithms through theoretical work. The Augmented CCAM research team will be vibrant consortium involving major industry partners, national research labs and four advanced test-sites across Europe.

Trinity College Dublin, the University of Dublin

Trinity College Dublin is Ireland's leading university, ranked No. 1 in Ireland and 101st in the world (QS World University Rankings 2021). Founded in 1592, the University is steeped in history with a reputation for excellence in education, research and innovation. Located on an iconic campus in the heart of Dublin's city centre, Trinity has 18,000 undergraduate and postgraduate students across our three faculties – Arts, Humanities, and Social Sciences; Engineering, Mathematics and Science; and Health Sciences.

Trinity is ranked as the 17th most international university in the world (Times Higher Education Rankings 2020) and has students and staff from over 120 countries.

The pursuit of excellence through research and scholarship is at the heart of a Trinity education, and our researchers have an outstanding publication record and strong record of grant success. Trinity has developed 19 broad-based multidisciplinary research themes that cut across disciplines and facilitate world-leading research and collaboration within the

University and with colleagues around the world. Trinity is also home to 5 leading flagship research institutes:

- Trinity Biomedical Sciences Institute (TBSI)
- Trinity College Institute of Neuroscience (TCIN)
- Trinity Translational Medical Institute (TTMI)
- Trinity Long Room Hub Arts and Humanities Research Institute (TLRH)
- Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN)

Trinity is the top-ranked European university for producing entrepreneurs for the past five successive years and Europe's only representative in the world's top-50 universities (Pitchbook Universities Report).

Trinity is home to the famous Old Library and to the historic Book of Kells as well as other internationally significant holdings in manuscripts, maps and early printed material. The Trinity Library is a legal deposit library, granting the University the right to claim a copy of every book published in Ireland and the UK. At present, the Library's holdings span approximately 6.5 million printed items, 400,000 e-books and 150,000 e-journals.

With over 120,000 alumni, Trinity's tradition of independent intellectual inquiry has produced some of the world's finest, most original minds including the writers Oscar Wilde and Samuel Beckett (Nobel laureates), the mathematician William Rowan Hamilton and the physicist Ernest Walton (Nobel laureate), the political thinker Edmund Burke, and the former President of Ireland Mary Robinson. This tradition finds expression today in a campus culture of scholarship, innovation, creativity, entrepreneurship and dedication to societal reform.

Rankings

Trinity College Dublin is Ireland's leading university, ranked No. 1 in Ireland and 101st in the world (QS World University Rankings 2021). Trinity ranks in the top 50 in the world on 6 subjects and in the top 100 in 20 subjects (QS World University Rankings by Subject 2019). Full details are available at: www.tcd.ie/research/about/rankings

Application Procedure

Applications must be sent by e-mail to Prof. Arman Farhang (arman.farhang@tcd.ie) in a single PDF file with the title “ResearchFellow_Application_{Applicant’s surname}”.

Applications should include:

1. A cover letter explaining the applicant’s motivation and interest to undertake the role. Any relevant background and/or experience needs to be mentioned.
2. A Curriculum Vitae that includes the applicant’s educational qualifications and any scientific publications and achievements.
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2 Information for applicants

The Selection Process in Trinity

The Selection Committee (Interview Panel) may include members of the Academic and Administrative community together with External Assessor(s).

The University's selection methods may consist of any or all of the following: Interviews, Presentations, Psychometric Testing, References and Situational Exercises.

Information supplied by candidates in their application (Cover Letter and CV) will be used to shortlist for interview.

Given the degree of co-ordination and planning to have a Selection Committee available on the specified date, the University regrets that it may not be in a position to offer alternate selection dates.

Communications

Applications will be acknowledged by email. If you do not receive confirmation of receipt within 2 hours of submitting your application online, please contact hr@tcd.ie immediately and prior to the closing date/time.

All communication with applicants will be by email.

By submitting your application electronically, you are declaring that the information you are supplying is factually correct.

Trinity College Dublin reserves the right to withdraw any offer of employment or if you have commenced employment, to terminate your employment should any of the information provided in the application be found to be false or misleading.

Eligibility

Applications from non-EEA citizens are welcomed. However, eligibility is determined by the Department of Business, Enterprise and Innovation and further information on the Highly Skilled Eligible Occupations List and the Ineligible Categories of Employment are set out in the Regulations.

<https://dbei.gov.ie/en/What-We-Do/Workplace-and-Skills/Employment-Permits/Employment-Permit-Eligibility/>.

Non-EEA candidates should note that the onus is on them to secure a visa to travel to Ireland prior to interview. Non-EEA candidates should also be aware that even if successful at interview, an appointment to the post is contingent on the securing of an employment permit.

Qualifications and Brexit

Applicants should note that for qualifications acquired in the UK from 1st January 2021, mutual recognition of professional qualifications (MRPQ) between the EU and the UK no longer applies.

Full list of the regulated professions and competent authorities can be accessed here

<https://www.education.ie/en/The-Education-System/Qualifications-Recognition/Contact-List-Mutual-Recognition-of-Professions.pdf>

More information is available on the Irish Government website

gov.ie - [Further and Higher Education and Brexit \(www.gov.ie\)](http://www.gov.ie)

UK nationals, irrespective of where they acquired their qualifications, and EU citizens with qualifications acquired in the United Kingdom will need to have their qualifications recognised in the relevant Member State on the basis of each country's existing individual rules applicable to the qualifications of third-country nationals as of the end of the transition period.

Pre-Employment Medical

It is the policy of the University to conduct pre-employment medical screening/full pre-employment medicals.

Equal Opportunities Policy

Trinity is an equal opportunities employer and is committed to employment policies, procedures and practices which do not discriminate on grounds such as gender, civil status, family status, age, disability, race, religious belief, sexual orientation or membership of the travelling community. On that basis we encourage and welcome talented people from all backgrounds to join our staff community. Trinity's Diversity Statement can be viewed in full at <https://www.tcd.ie/diversity-inclusion/diversity-statement>.

Pension Entitlements

This is a pensionable position and details of the relevant Pension Scheme will be provided to the successful applicant on receipt of the completed Pre-Employment Declaration form. Applicants formerly employed by the Irish Public Service that may previously have availed of an Irish Public Service Scheme of Incentivised early retirement or enhanced redundancy payment should ensure that they are not precluded from re-engagement in the Irish Public Service under the terms of such Schemes. Such queries should be directed to an applicant's former Irish Public Service Employer in the first instance.

Garda Clearance

Police vetting may be sought in respect of individuals who come under consideration for a post.

Applicants will be required to complete and return a Garda Vetting form should they come under consideration for appointment. In some cases, they may be requested to complete the form on the day of interview. This form will be forwarded to An Garda Síochána (Irish Police) for security checks on all Irish addresses at which they have resided. An Garda Síochána will make enquiries with the Police Service of Northern Ireland with respect to addresses in Northern Ireland. If an applicant is not successful in obtaining the post for whatever reason, this information will be destroyed. If an applicant, therefore, subsequently comes under consideration for another position, they will be required to supply this information again.

If an applicant has resided in countries outside of Ireland for a cumulative period of 3 years or more, it is mandatory for them to furnish a Police Criminal Records Check/ Police Certificate from those countries stating that they have no convictions recorded against them while residing there. Applicants will need to provide a separate Police Criminal Records Check/ Police Certificate for each country in which they have resided. The Police Criminal Records Check/ Police Certificate must be dated after the date the applicant left the relevant country. Applicants should provide documentation in the English and/or Irish language. Translations must be provided by a registered translation company/institute in the Republic of Ireland. Only original version documents will be accepted.

Applicants should be aware that any information obtained in the Garda Vetting process can be made available to the employing area.