Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Post Specification

Post Title:	Postdoctoral Researcher in Intelligent Mobility/ Autonomous Car Sharing
Post Status:	14 months Fixed Term Contract, Full-time
Research Group /Department/School:	Future Cities Research Centre Distributed Systems Group School of Computer Science and Statistics Trinity College Dublin, the University of Dublin
Location:	School of Computer Science and Statistics Trinity College Dublin College Green, Dublin 2, Ireland
Reports to:	Principal Investigator or Head of School
Salary:	IUA salary scale, Post-Doctoral Researcher level 2 point 1; €35,488
Closing Date and Time:	12 Noon on November 21st 2017

Post summary

The Future Cities Research Centre and Distributed Systems Group in the School of Computer Science and Statistics at Trinity College Dublin, are seeking one Post-Doctorate Researcher to work with Professor Ivana Dusparic (co-PI, Computer Science) and Professor Federico Cugurullo (PI, Geography) on the project *SURPASS: how shared autonomous cars will transform cities*. The successful candidate will be a core member of the SURPASS team, working together with the PI, the Co-PI, another Post-Doctorate Researcher and four research assistants. The SURPASS team will merge Urban Geography with Computer Science, in order to foresee the impact that shared autonomous cars will have on urban living and urban design.

This position is meant to cover the Computer Science/Intelligent Mobility part of the project. More specifically, the successful candidate will focus on (a) research into autonomous car-sharing algorithms, (b) simulation of autonomous car-sharing in cities, and (c) impact of autonomous car-sharing on traffic conditions and urban space.

As the success of the project depends on the synergy between the two disciplines involved, the successful candidate will play a central role by working in tandem with the other Post-Doctorate Researcher from Geography. Sustainability is the underpinning thread that animates the project and connects urban geography with computer science: we expect potential candidates to be passionate about issues of environmental preservation, social justice and happiness, and be keen to use their research to become drivers of change.

Enquiries concerning the post should be addressed to Professor Ivana Dusparic at ivana.dusparic@scss.tcd.ie

SURPASS project summary

It is estimated that autonomous cars will surpass manual forms of driving by 2040, thereby imposing themselves on both the built and the natural environment. Historically, changes in transport, such as the diffusion of the first automobiles in the 1920s, have led to dramatic changes in urban infrastructures, with severe negative environmental and social repercussions. The changes that the diffusion of autonomous cars will cause will be radical, inasmuch as what is a technologically new form of transport (a self-driving automobile provided with an artificial intelligence), is being linked to a burgeoning form of transport experience: sharing. While companies in the automobile industry such as Ford, Toyota, BMW and Volkswagen, estimate that they will be able to commercialize the first models of private self-driving cars by 2020, large international car-sharing companies like Uber are already employing autonomous cars.

By merging urban geography with computer science, Surpass will use Dublin as a case study to anticipate and map the infrastructural changes that autonomous cars will trigger, so that cities can use these changes as an opportunity to evolve in a sustainable way. Surpass is funded by the Irish Research Council as part of the New Horizons scheme which has interdisciplinary at its core. The Surpass team will be composed of visionary researchers with different academic backgrounds, which will combine established methodologies from the social sciences and computer science (such as surveys, scenario building, modelling and computer simulation) to accomplish four objectives: (1) to understand the attitude of citizens towards car-sharing services provided by autonomous cars and the relevant adoption factors; (2) to anticipate the rate at which citizens will adopt shared autonomous cars, and model different scenarios for adoption and diffusion; (3) to estimate the impact that the diffusion of shared autonomous cars will have on car ownership and traffic conditions; (4) to quantify the amount of urban space that will become superfluous under various scenarios of deployment, and map the areas of the city that can be freed up and reused for sustainability purposes.

Person Specification

Qualifications

The successful candidate will hold a PhD in Computer Science or a related area.

Knowledge, skills and experience (essential and desirable)

The successful candidate will have:

- Excellent research skills in intelligent mobility, intelligent algorithms, multi-agent systems, large-scale optimisation and traffic simulation
- Excellent software development skills
- Experience in using traffic simulation packages
- Commitment to working across disciplines

- Publications in peer-reviewed conferences and journals
- Strong written and oral communication skills
- Initiative and capacity to develop a research project autonomously

It is desirable that the successful candidate will have:

- Experience of disseminating findings beyond academic outlets, for example via social media
- Basic experience of interdisciplinary research in smart mobility/smart cities

Further Information for Candidates

URL Link to Research Group	https://www.tcd.ie/futurecities/ http://www.dsg.cs.tcd.ie/FutureCities
URL Link to Human Resources	https://www.tcd.ie/hr/

Distributed Systems Group, School of Computer Science and Statistics

Established in 1981, the Distributed Systems Group (DSG) is the longest standing research group in the Department of Computer Science at Trinity College Dublin. DSG conducts basic and applied research into all aspects of distributed computing extending from the theoretical foundations underpinning the field to system engineering issues. Our expertise is in the areas of middleware, ubiquitous computing, mobile computing and software engineering.

Future Cities: The Trinity Centre for Smart and Sustainable Cities

The Future Cities Research Centre undertakes multi-disciplinary research that enables, promotes and facilitates behavioural change for sustainability. The research is supported by the application of sensor, communication and analytical technological solutions to sustainability concerns in urban infrastructure such as energy, water,

waste management and transportation systems. Unlike other research centres focussed on distinct elements of a Future City such as the energy grid, autonomous transport, or assisted living, the Future Cities Research Centre is taking a holistic view addressing all aspects of the challenge facing growing urban centres and involving researchers from computer science, statistics, information systems, engineering, natural sciences, social science, chemistry, arts, nursing and midwifery, business and law.

Trinity College Dublin, the University of Dublin

Founded in 1592, Trinity is at the nexus of tradition and innovation, offering undergraduate and postgraduate programmes across 24 schools and three faculties: arts, humanities, and social sciences; engineering, maths and science; and health sciences. Spread across 47 acres in Dublin's city centre, Trinity's 17,000-strong student body comes from all 32 counties of Ireland, and 16% of students come from outside the country. Of those, 40% are from outside the European Union, making Trinity's campus cosmopolitan and bustling, with a focus on diversity.

As Ireland's leading university, the pursuit of academic excellence through research and scholarship is at the heart of the Trinity education. Trinity is known for intellectual rigour, excellence, interdisciplinarity, and research-led teaching. Home to Nobel prize-winners such as scientist Ernest Walton and writer Samuel Beckett, Trinity draws visitors from across the world to its historic campus each year, including to the Book of Kells and Science Gallery which capture the university's connection to both old and new.

Trinity accounts for one-fifth of all spin-out companies from Irish higher education institutions, helping to turn Ireland into an innovation-intensive, high-productivity

economy. That culture of innovation and entrepreneurship is a defining characteristic of our campus as we help shape the next generation of job creators.

Trinity has developed significant strength in a broad range of research areas, including the 19 broadly based multi-disciplinary thematic research areas.

Ireland's first purpose-built nanoscience research institute, CRANN, houses 150 scientists, technicians and graduate students in specialised laboratory facilities. Meanwhile, the state-of-the-art Biomedical Sciences Institute is carrying out breakthrough research in areas such as immunology, cancer and medical devices.

The Old Library, which houses the Long Room, in Trinity is the largest research library in Ireland, with a collection of six million printed items, 500,000 maps, 80,000 electronic journals, and 350,000 electronic books. Some of the world's most famous

scholars are graduates of Trinity, including writer Jonathan Swift, dramatist Oscar Wilde, philosopher George Berkeley, and political philosopher, and political theorist Edmund Burke. Three Trinity graduates have become Presidents of Ireland - Douglas Hyde, Mary Robinson and Mary McAleese.

Trinity is the highest ranked university in Ireland, and among the world's leading higher education institutions.

Trinity College Dublin World University Rankings

Overall

- Trinity is Ireland's No.1 University in the QS World University Ranking, THE World University Ranking and the Academic Ranking of World Universities (Shanghai).
- Trinity is ranked 71st in the World and 21st in Europe in the 2013/2014 QS World University Ranking across all indicators.

Internationalisation

- Trinity is ranked 44th in the World in the Times Higher Education Top 100 Most International Universities.
- Trinity is 46th in the World in the QS World University Ranking 2013/2014 in terms of International Faculty.

Research Performance

- Trinity is ranked in the top 70 universities in the world in the Times Higher Education Ranking of World Universities in terms of overall research and in the top 75 universities in the world in terms of citations (research impact).
- Trinity ranks in the top 1% of research institutions in the world in the following 17 Essential Science Indicators fields (an increase of over 150%

from 2004): Physics, Chemistry, Engineering, Social Sciences (General), Immunology, Neurosciences, Nanosciences, Materials Science, Pharmacy and Toxicology, Molecular Biology and Genetics, Biology and Biochemistry, Microbiology, Plant and Animal Science, Clinical Medicine, Agriculture, Psychiatry/Psychology, Environment/Ecology.

In the QS Faculty Rankings 2015*:

- Trinity is ranked 63rd in the world in Arts and Humanities.
- Trinity is ranked 69th in the world in Life Sciences and Medicine.
- Trinity is ranked 89th in the in Social Sciences and Management.

In the QS Subject Rankings 2015:**

Trinity College Dublin features in the world's elite (Top 200) institutions in 25 of the 28 subjects in which it was evaluated by the QS World University Rankings by Subject 2015. Of these, Trinity ranks in the top 100 in the world in 14 subjects and in the top 5 in the world in 5 subjects.

Top 50

- Trinity is ranked 32nd in the world in English Language and Literature.
- Trinity is ranked 33rd in the world in Politics and International Studies.
- Trinity is ranked 39th in the world in History.
- Trinity is ranked 48th in the world in Biological Sciences.
- Trinity is ranked 49th in the world in Modern Languages.

Top 100

- Trinity is in the top 100 in the world in Chemistry.
- Trinity is in the top 100 in the world in Computer Science and Information Systems.
- Trinity is in the top 100 in the world in Education.

- Trinity is in the top 100 in the world in Geography.
- Trinity is in the top 100 in the world in Law.
- Trinity is in the top 100 in the world in Medicine.
- Trinity is in the top 100 in the world in Pharmacy and Pharmacology.
- Trinity is in the top 100 in the world in Philosophy.
- Trinity is in the top 100 in the world in Psychology.

Trinity subjects ranked in the world top 101-200 (QS Subject Ranking 2015)

Subject	Trinity Rank
Accounting and Finance	101-150
Business and Management Studies	101-150
Economics and Econometrics	101-150
Linguistics	101-150
Physics and Astronomy	101-150
Sociology	101-150
Engineering - Civil and Structural	151-200
Engineering – Electrical	151-200
Engineering – Mechanical	151-200
Environmental Sciences	151-200
Mathematics	151-200

* QS 'Faculty' Rankings 2015: www.topuniversities.com/faculty-rankings

** QS Subject Rankings 2015: www.topuniversities.com/subject-rankings

Pension Entitlements

This is a pensionable position and the provisions of the Public Service Superannuation (Miscellaneous Provisions) Act 2004 will apply in relation to retirement age for pension purposes. Details of the relevant Pension Scheme will be provided to the successful applicant.

Applicants should note that they will be required to complete a Pre-Employment Declaration to confirm whether or not they have previously availed of an Irish Public Service Scheme of incentivised early retirement or enhanced redundancy payment. Applicants will also be required to declare any entitlements to a Public Service pension benefit (in payment or preserved) from any other Irish Public Service employment.

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.

Employment Permit Eligibility Criteria

Applications from non-EEA citizens are welcomed. However, eligibility is determined under the relevant regulations of the Department of Jobs, Enterprise and Innovation. Trinity, as an accredited research organisation, can form Hosting Agreements with third country nationals (Non-EEA nationals) for the purposes of conducting research in the University. 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 a Hosting Agreement or Employment Permit as appropriate. See https://www.djei.ie/en/What-We-Do/Research-Innovation/Hosting-Agreement-Scheme/

Equal Opportunities Policy

Trinity College 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 College's Diversity Statement can be viewed in full at
https://www.tcd.ie/diversity-inclusion/diversity-statement

Application Procedure

Candidates should submit a Full CV with contact details of 2 referees, and a cover letter outlining research experience to date and suitability for the post to Prof. Ivana Dusparic (Surpass co-PI) no later than 12 noon on **November 21st** 2017. Late applications will not be considered.
Email Address: ivana.dusparic@scss.tcd.ie