

# CONNECT

Centre for Future Networks

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| <b>Position Title</b>   | PhD Studentship in Communication Networks for Cooperative Communications for Vehicular Platoons  |
| <b>Project Abstract</b> | <p>Platoons, where vehicles travel in a convoy in close proximity, promise greater fuel efficiencies, improved safety and better use of infrastructure. Safely maintaining these platoons in real-world conditions will not simply depend on the vehicle's on-board sensors but also on cooperative communications amongst the vehicles themselves and also with infrastructure. Thus the reliability and latency of such communications is vital. Existing DSRC wireless technologies are susceptible to network congestion and are unable to guarantee adequate latency support and reliability. Cellular vehicular standards are only now emerging and may also provide inadequate latency.</p> <p>To reliably maintain platoon stability in real-world conditions, a hybrid communications approach is necessary using heterogeneous on-board technologies to compensate for the wireless/cellular communication deficit in Line of Sight (LOS) /NLOS scenarios. Using analytical modelling, discrete-event and potentially proof-of-concept (PoC) implementations, this project will quantify the stringent application layer requirements and the performance limits of existing DSRC network and MAC layer protocols. It is expected that based on the findings, the benefits and potential drawbacks of using heterogeneous technologies such as in-vehicle sensors (light and radar) and Cellular V2X will be evaluated as input into the platoon management algorithm to dynamically tune its behaviour based on the network/platoon characteristics to deliver more reliable performance and thus maintain the platoon stability. Based on the identified performance boundaries of the hybrid communication network, actions to preserve platoon stability can be taken e.g. increase inter-vehicle safety distance, abandonment the platoon, fall back of an individual vehicle within the platoon etc.</p> |
| <b>Location</b>         | University College Cork  |
| <b>Experience</b>       | The PhD position is funded for 4 years, including a monthly stipend and a travel budget to present at international conferences. The successful candidate will also have the opportunity to work with the Principal Investigator's network including automotive OEMs, and contribute towards Ireland's Connected Autonomous Vehicle (CAV) agenda. Applicants should hold a minimum of an honours bachelor's degree at 2:1  |



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|   | level or equivalent in a relevant subject such as electronics/computer/communication engineering or computer science. Candidates should also have a strong interest in computer networking, wireless communication networks, software, systems and have strong programming skills.  |
| <b>Funding / Stipend</b>                            | The studentship will cover fees up to 5,500k pa and a stipend of 18,500k pa   |
| <b>Closing Date</b>                                 | Friday 15 <sup>th</sup> June 2018   |
| <b>Contact</b>                                      | Dr. Aisling O' Driscoll ( <a href="mailto:a.odriscoll@cs.ucc.ie">a.odriscoll@cs.ucc.ie</a> )  |
| <b>Application Process / Additional Information</b> | Interested candidates should apply by email to Dr. Aisling O' Driscoll ( <a href="mailto:a.odriscoll@cs.ucc.ie">a.odriscoll@cs.ucc.ie</a> ), cc'ing the Department of Computer Science ( <a href="mailto:csmanager@cs.ucc.ie">csmanager@cs.ucc.ie</a> ), on or before the 15 <sup>th</sup> of June 2018. Early applications are encouraged. Applications should include: 1) a cover letter (1 page) explaining their interest in the project topic and mentioning any relevant background and/or experience; 2) a Curriculum Vitae. Academic transcripts and two academic references will be required after a shortlisting process takes place. |