

IFN712 Research Project placement Form-2024

(Submission by 29 July 2024)

Your name and ID	YICHEN CHEN (Carla), n11564628
Your email	Carla10969@gmail.com
Project owner Industry School	School of Information System
Supervisors and emails Industry supervisor Academic supervisor	Muhammad Furqan muhammad.furqan@hdr.qut.edu.au
Project title	Integration of LEO Satellite Networks with 5G and 6G Terrestrial Networks
Cluster	6
Cluster tutor's name and email address	Anisur Rahman a5.rahman@qut.edu.au
Brief description of the research problem, aims, method and expected outputs	<p>Research Problem Integrating LEO satellite networks with 5G and 6G terrestrial networks presents technical challenges.</p> <p>Aims This study aims to develop protocols and architectures for integrating LEO satellite networks with 5G and 6G terrestrial networks to provide seamless global connectivity.</p> <p>Methodology</p> <ul style="list-style-type: none"> Conduct a literature review on the current state of LEO satellite and 5G/6G integration efforts. Develop protocols for seamless handover and interoperability between satellite and terrestrial networks. <p>Expected Outputs</p> <ul style="list-style-type: none"> Protocols for seamless integration of LEO satellite and 5G/6G terrestrial networks.
Your choice of research questions and what you will focus on (up to 2)	<ol style="list-style-type: none"> What are the key challenges in integrating LEO satellite networks with 5G and 6G terrestrial networks? (What are the performance impacts of integrating satellite and terrestrial networks on throughput, latency, and reliability?)
Key references (initial list)	<ul style="list-style-type: none"> Salahdine, F., Han, T., & Zhang, N. (2023). 5G, 6G, and Beyond: Recent advances and future challenges. <i>Annals of Telecommunications</i>, 78(9), 525-549. Zhen, L., Bashir, A. K., Yu, K., Al-Otaibi, Y. D., Foh, C. H., & Xiao, P. (2020). Energy-efficient random access for LEO satellite-assisted 6G internet of remote things. <i>IEEE Internet of Things Journal</i>, 8(7), 5114-5128. Luo, X., Chen, H. H., & Guo, Q. (2024). LEO/VLEO Satellite Communications in 6G and Beyond Networks—Technologies, Applications and Challenges. <i>IEEE Network</i>.
Major of your studies, skills, knowledge, and speciality and why you choose this project	<p>Major: Cyber Security</p> <p>Skill: Basic python programming and network knowledge</p> <p>While I still use the 4G network on my phone, the unfamiliar 5G and 6G are nearly published. Therefore, developing them can help me improve my understanding of modern computer network infrastructure.</p>

<p>Industry-based project: Student IP Agreement. This is the IP model agreed between the parties. Please note that it is QUT policy that where possible students should be allowed to keep their IP. If students are asked to assign their work then please provide a brief rationale as additional permissions are needed by QUT to approve.</p>	<p><input type="checkbox"/> Project IP vests in the Student with a license back to Industry Partner (licence)</p> <p>OR</p> <p><input checked="" type="checkbox"/> Project IP vests in the Industry Partner with a licence back to the Student (assignment)</p> <p>OR</p> <p><input type="checkbox"/> Academic project</p>
<p>Other students in the same project (if known)</p>	<p>No</p>
<p>2</p>	
<p>3</p>	
<p>4</p>	

Supervisor's agreement
(an email message
confirming acceptance of
your participation in the
project

Dear Carla,

Thank you for your interest in the IFN712 project on "Integration of LEO Satellite Networks with 5G and 6G Terrestrial Networks." Your background in cybersecurity will bring a valuable perspective to the project.

While programming skills are useful, they are not a barrier to your participation. We can focus on simulations and other approaches to address any programming challenges you might encounter. This project will provide a great opportunity to enhance your skills and knowledge in an applied context.

Please complete the project placement form and submit it at your earliest convenience, and join the project cluster to begin collaborating with the team.

If you have any questions or need further assistance, please feel free to contact me.

Looking forward to working with you on this exciting project.