Queen Mary
University of London

China Scholarship Council PhD Studentships

Yuanwei Liu

Senior Lecturer

School of Electrical Engineering and Computer Science

China Scholarship Council (CSC) PhD Studentships

- China Scholarship Council (www.csc.edu.cn) is a non-profit institution under the Ministry of Education China.

- The scheme includes:
  - A **fee waiver** to cover all tuition fees, sponsored by Queen Mary University of London
  - 4 year **living expenses (£1350/month)** and **one return flight ticket**, sponsored by CSC

- Queen Mary is one of the biggest supporters in the UK of the CSC scheme with **60 places per year funded**.

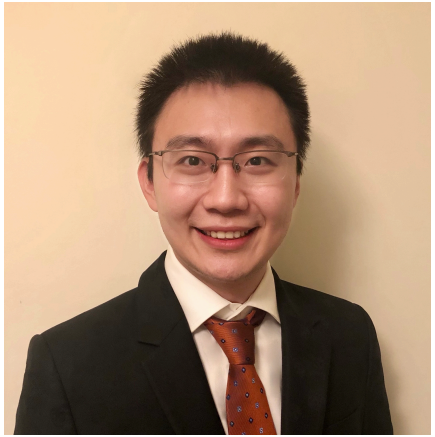
How to Apply

- Identify projects of interest
- Email the project supervisor to express interest
- Prepare online application matching subject area
  - https://www.qmul.ac.uk/postgraduate/research/applying-for-a-phd/ for Ph.D. students
  - https://www.qmul.ac.uk/postgraduate/associate/ for visiting/associate students
- On the application form, in the funding section, indicate you are making a CSC studentship application
- Meet the IELTS requirements for your course
- The deadline for applications is **30 Jan 2022**
- Once obtained offer letter from Queen Mary, complete the CSC application between **10 March - 31 March 2022.**
- Contact Flora Mckay at f.mckay@qmul.ac.uk for any questions.

Supervisor: Dr. Yuanwei Liu

Senior Lecturer (Associate Professor)

Website: http://www.eecs.qmul.ac.uk/~yuanwei/



- Web of Science Highly Cited Researcher (Citations: 10153, H-index: 47)
- IEEE ComSoc Young Professional Outstanding Nominee
- IEEE CTTC Early Achievement Award
- IEEE ComSoc Outstanding Young Researcher Award

Project 1

Simultaneously Transmitting and Reflecting Reconfigurable Intelligent Surfaces (STAR-RISs) Aided Wireless Communications

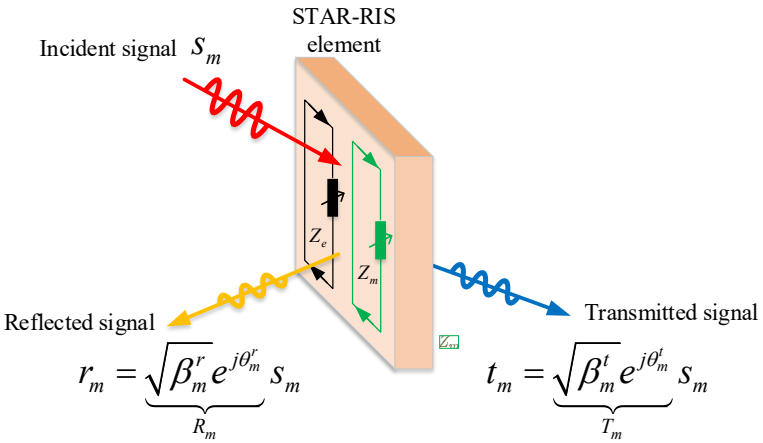
Research Challenge: The novel concept of simultaneously transmitting and reflecting (STAR) reconfigurable intelligent surfaces (RISs) is to facilitate a full-space manipulation of signal propagation, where the incident wireless signal is divided into transmitted and reflected signals passing into both sides of the space surrounding the surface.

Research Aims: Research topics include, but not limited to:

1. The fundamental electromagnetic and hardware models
2. The basic communication signal model and operating protocols
3. The corresponding fundamental performance analysis, beamforming design, and channel estimation methods

Methods: Performance analysis, beamforming, channel estimation, communication protocols

Outcome: Practical communication models and performance analysis for STAR-RIS.



Contact: yuanwei.liu@qmul.ac.uk Application Details here

Project 2

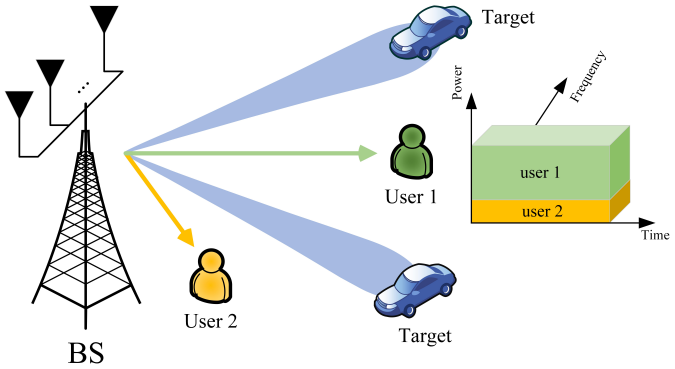
Integrated Sensing and Communications (ISAC): A New Non-orthogonal Framework

Research Challenge: Unlike 5G where there is only one envisaged function, i.e., wireless communication, the next generation wireless network expects a paradigm shift to support multiple functions including the communication, sensing, control, and computation to meet the demand of the fusion techniques such as unmanned aerial vehicles, autonomous driving, virtual and augmented reality, Internet of vehicles, and smart cities.

Research Aims: Research topics include, but not limited to:

1. Utilize NOMA to boost the load capability of ISAC
2. Follow the concept of NOMA to manage or exploit the interference in ISAC
3. Investigate the potential of NOMA as the enabler of more sophisticated ISAC frameworks

Methods: Wireless sensing, wireless communication, NOMA, machine learning



Outcome: New NOMA systems based on ISAC scenarios.

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Project 3

Next Generation Multiple Access Towards 6G

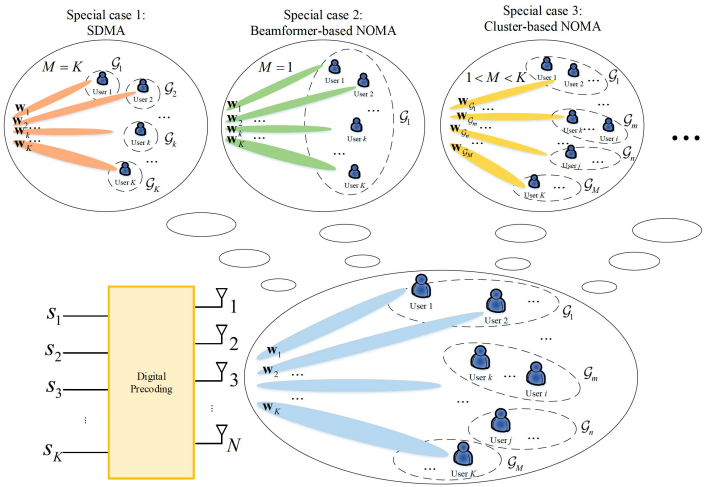
Research challenge: Next generation wireless networks are expected to achieve significantly high capacity, extremely low latency, ultra high reliability, as well as massive and ubiquitous connectivity for supporting diverse disruptive applications. One of the most fundamental issues is the design of sophisticated multiple access (MA) techniques for the next generation wireless networks, namely next generation multiple access (NGMA).

PhD research: Research topics include, but not limited to:

1. Explore the development of NGMA by exploiting non-orthogonal multiple access (NOMA) and multiple antenna techniques
2. Design NGMA frameworks based on both downlink and uplink multi-user communication scenarios

Methods: NOMA, multiple antenna techniques, machine learning

Outcome: MA frameworks to enable highly flexible and customized communication services for future wireless networks.



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Project 4

Machine Learning for Long-term Wireless Communications

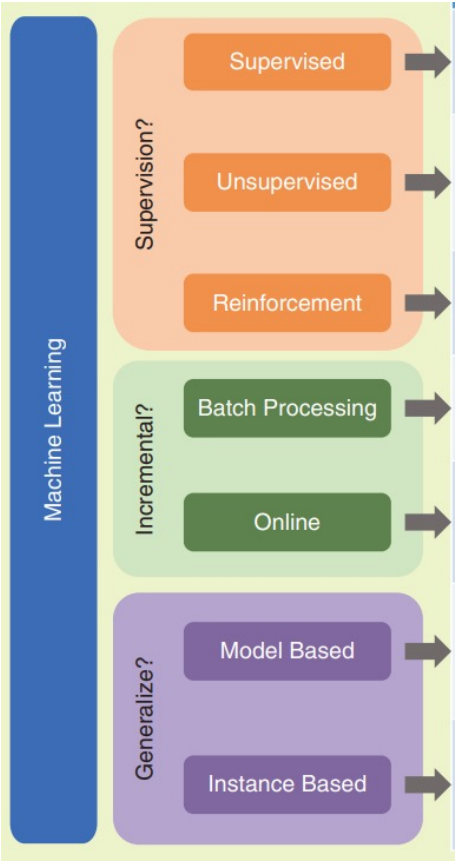
Research Challenge: Conventional optimisations in wireless networks focus on static scenarios and current benefits, which omit the mobility effects and the farsighted network evolution. Since reinforcement learning (RL) can be used to empower agents to interact with a given environment providing autonomous long-term decisions, we will use Machine Learning methods, mainly RL, to optimise the long-term communications.

PhD research: Research topics include, but not limited to:
1. New RL Architectures to address the huge action-state-space issue.
2. Deep Neural Network Designs in RL to enhance the performance of reinforcement learning algorithms.
3. Distributed RL Designs in Wireless Networks with heterogenous mobility.

Methods: Reinforcement learning, wireless communications, deep learning

Outcome: New RL approaches for handling long-term optimisation in wireless networks.

Contact: yuanwei.liu@qmul.ac.uk Application Details here



Queen Mary University of London

- Queen Mary University of London is one of the UK's leading research-focused higher education institutions
- Over 28,000 students, close to 4,500 members of staff and an annual turnover of £512m
- Queen Mary is one of 24 leading UK universities represented by the Russell Group
- The QS World Universities Rankings place Queen Mary in the top 9% of universities worldwide