Connected Digital Twins

Can we close the loop?

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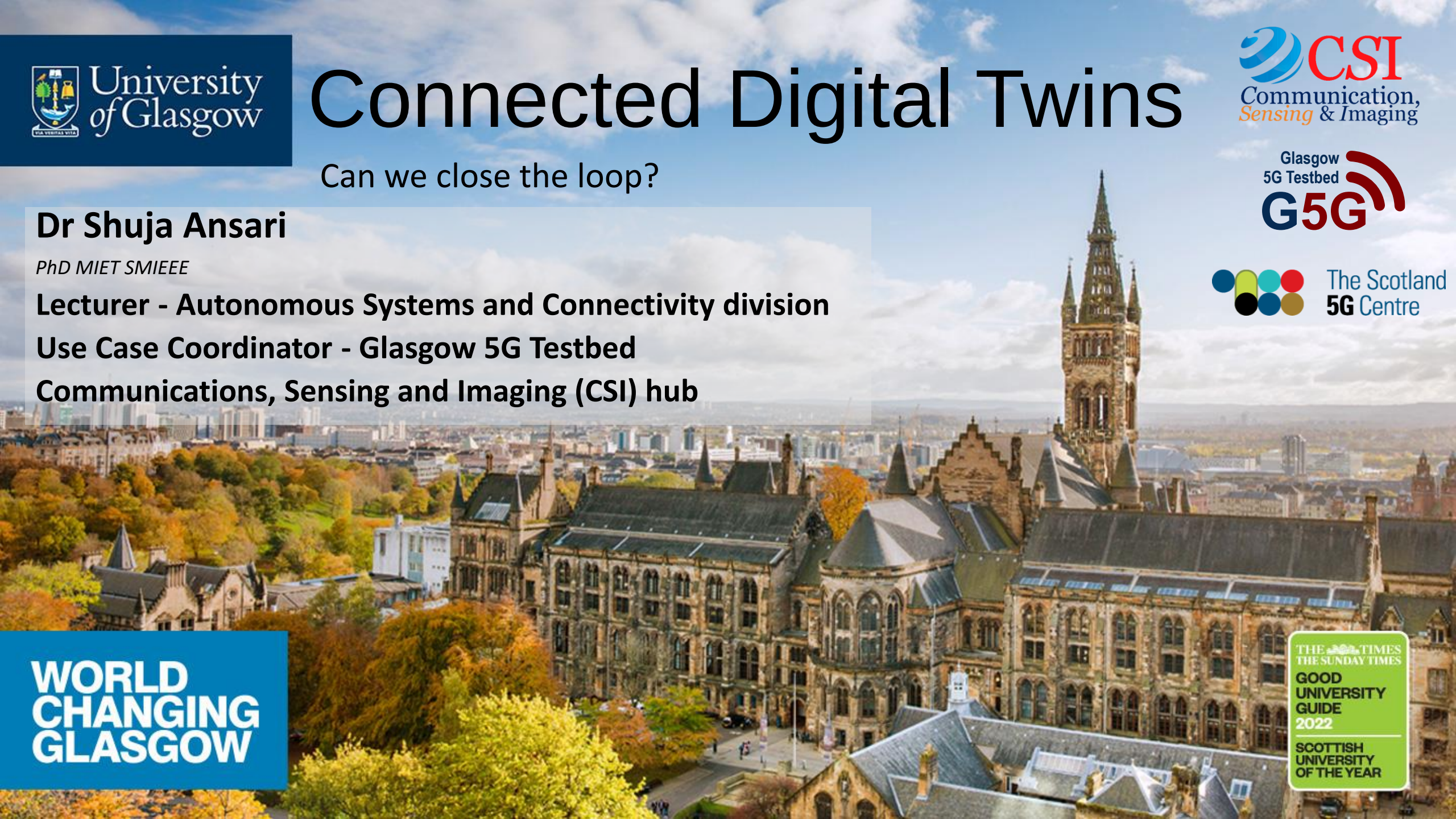
Communications, Sensing and Imaging (CSI) hub



Background

- **PhD research** in Cooperative Intelligent Transport Systems
- **Postdoc research** in 5G use cases and applications
- As an **academic researcher**
  - 5G use cases
    - eMBB, URLLC, mMTC
    - OpenRAN
  - IoT – LoRaWAN, NB-IoT
    - Space and Asset Monitoring
  - RFID based solutions
    - Energy Harvesting
  - AI/ML
    - Chatbots and NLP

Black Mirror

How close are we to a Black Mirror-style digital afterlife?

One of the threads running through season concerns digital versions of we die ... it could happen sooner th

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Andrea Riseborough in the Bl
Netflix

When R
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"I didn't expec
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Roman's avatar wa

Be Right Back

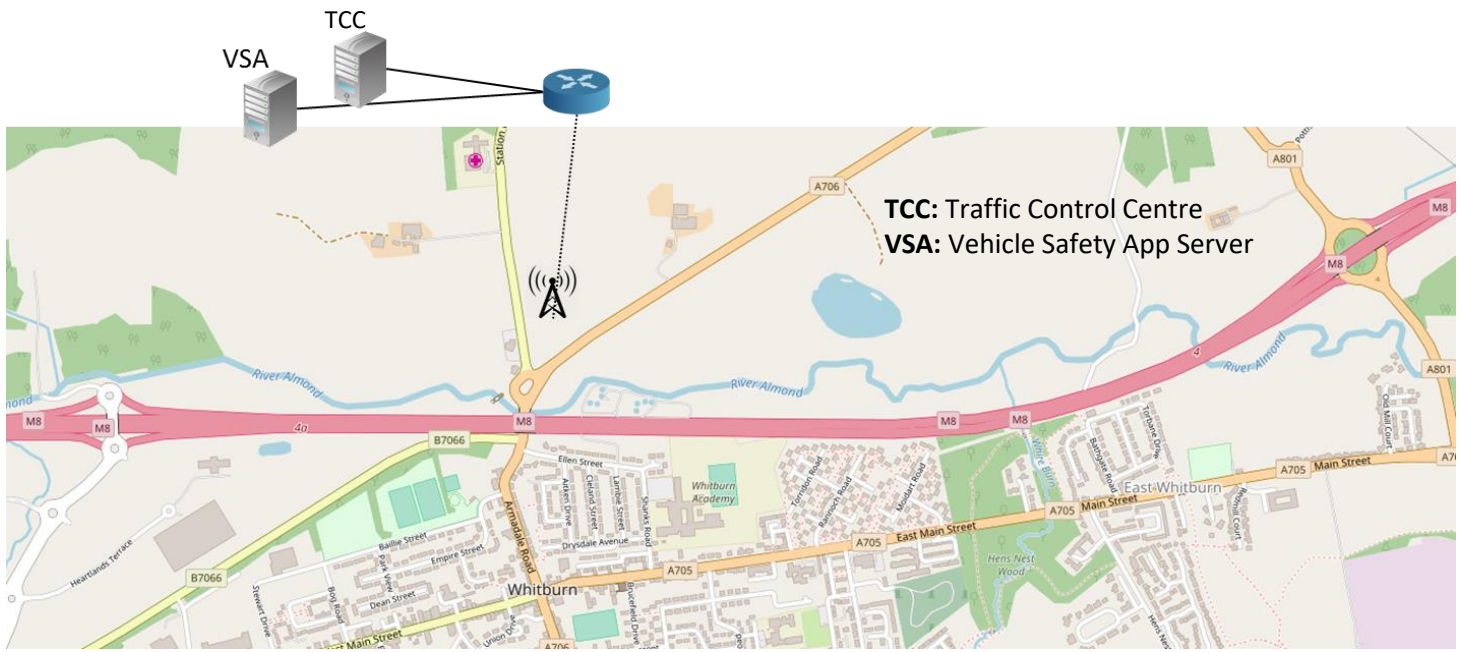
Black Mirror: Season 2, Episode 1

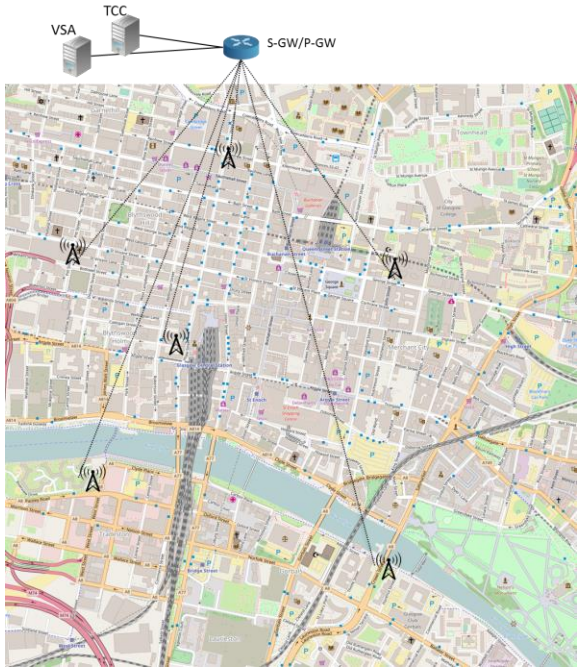
Young couple Martha and Ash move into a remote cottage; Ash is killed the very next day; at his funeral, Martha's friend Sarah tells her about a new service that lets people stay in touch with the deceased.

Want to live for ever? Get a digital twin

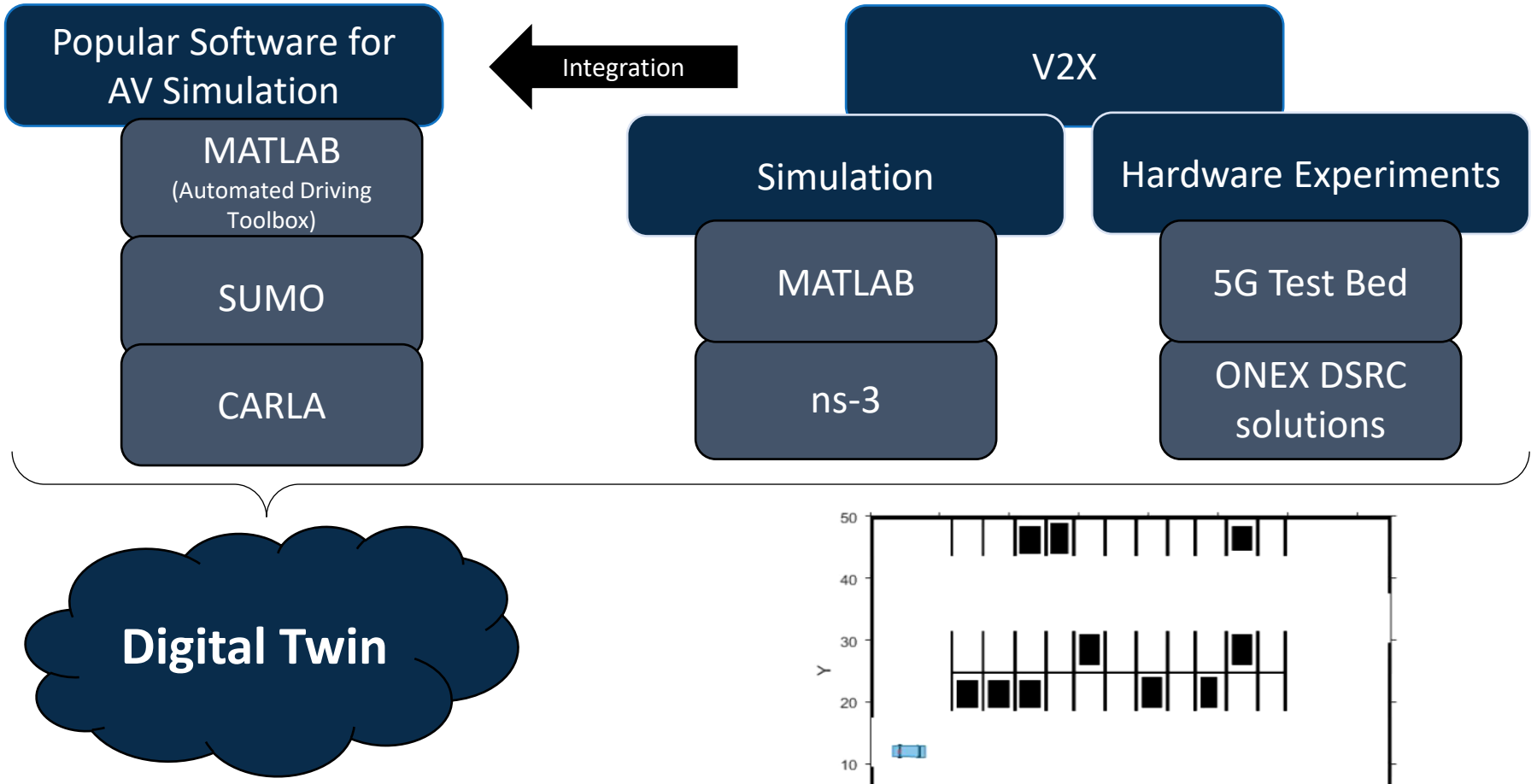
But the Prince of
wins, who live on after we
around the corner.

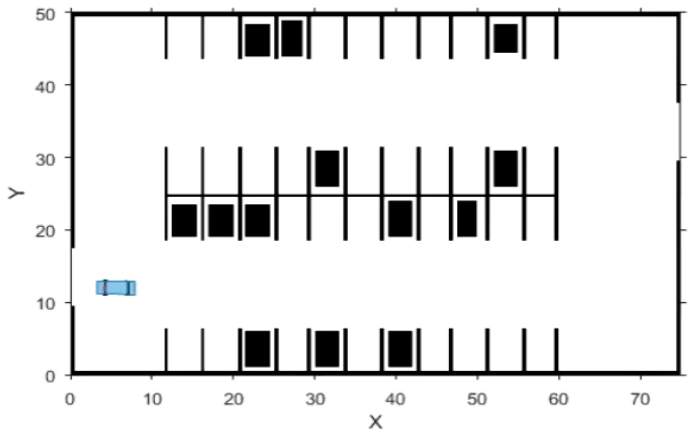
Digital Twin for Wireless Connectivity



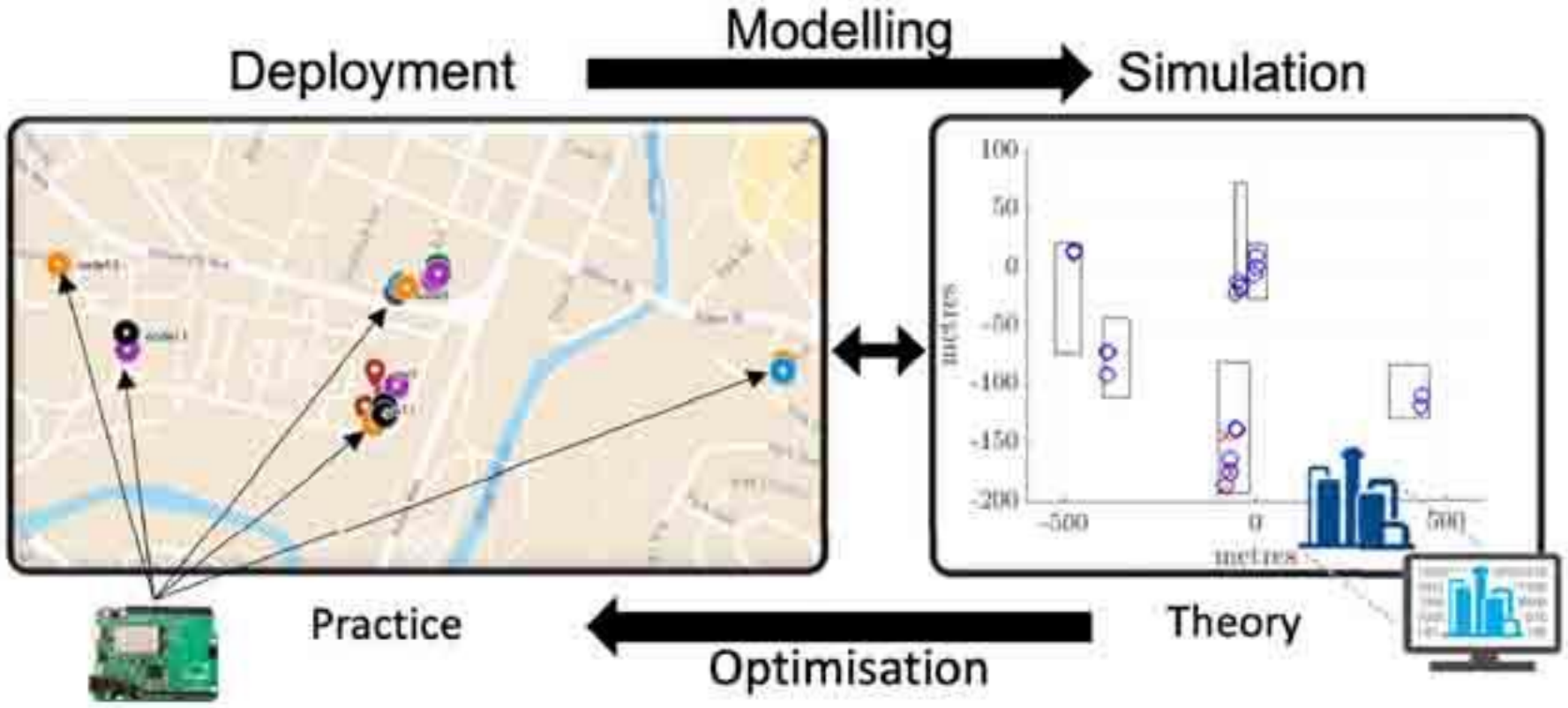


Digital Twin for Connected Autonomous Vehicles

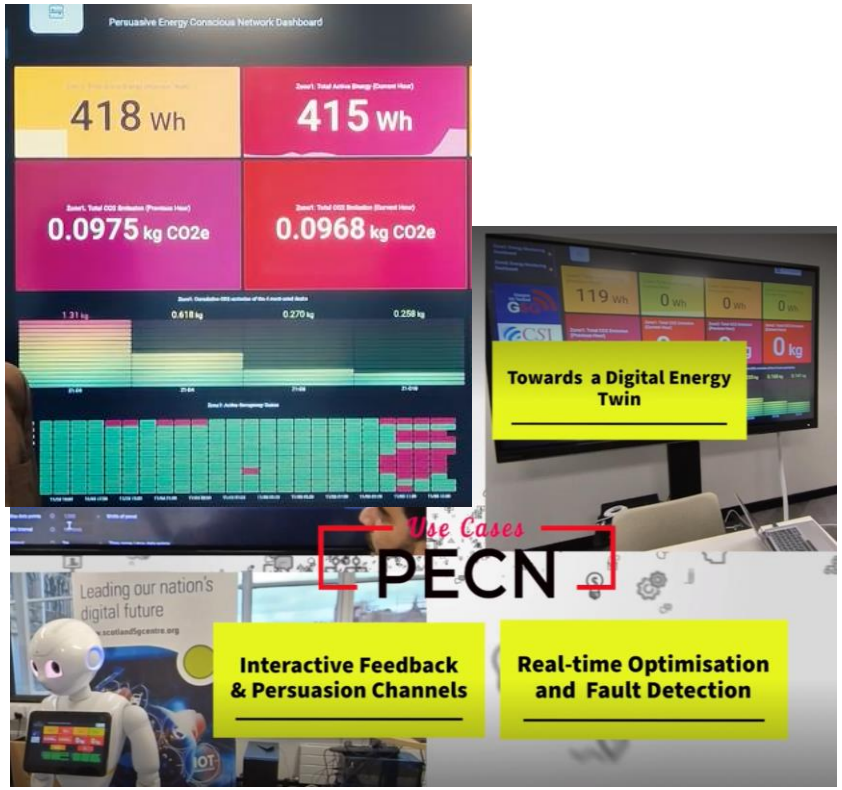


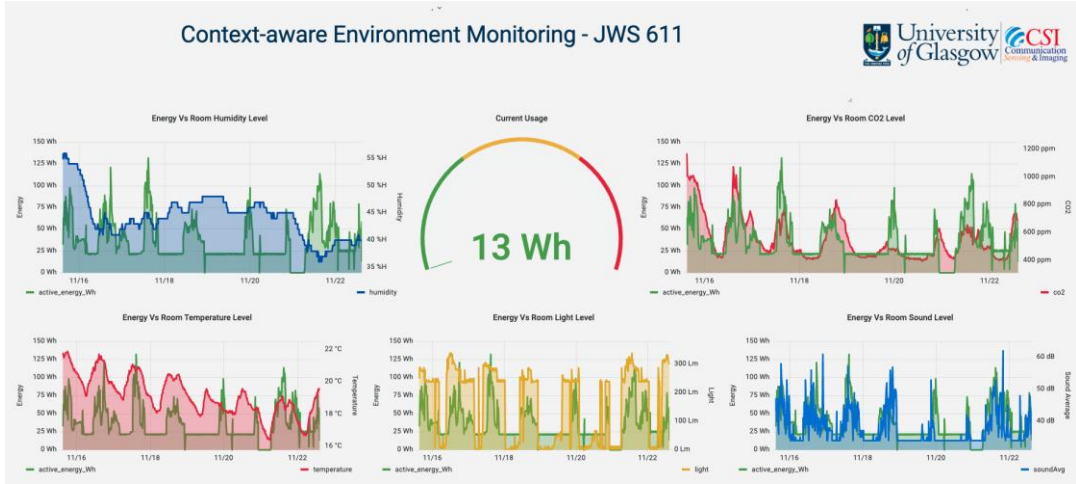


Digital Twin for Internet of Things Connectivity



Digital twins for our workspaces





Energy Monitoring

Space Monitoring

Environment Monitoring

Using Social Media and NLP to close the loop on self organizing networks

frontiers in Big Data

ORIGINAL RESEARCH
published: 18 June 2021
doi: 10.3389/fdata.2021.640868

Public Perception of the Fifth Generation of Cellular Networks (5G) on Social Media

Kia Dashtipour[1], William Taylor[1], Shuja Ansari[1], Mandar Gogate[2], Adnan Zahid[1], Yusuf Sambo[1], Amir Hussain[2], Qammer H. Abbasi[1,3] and Muhammad Ali Imran[1,4]*

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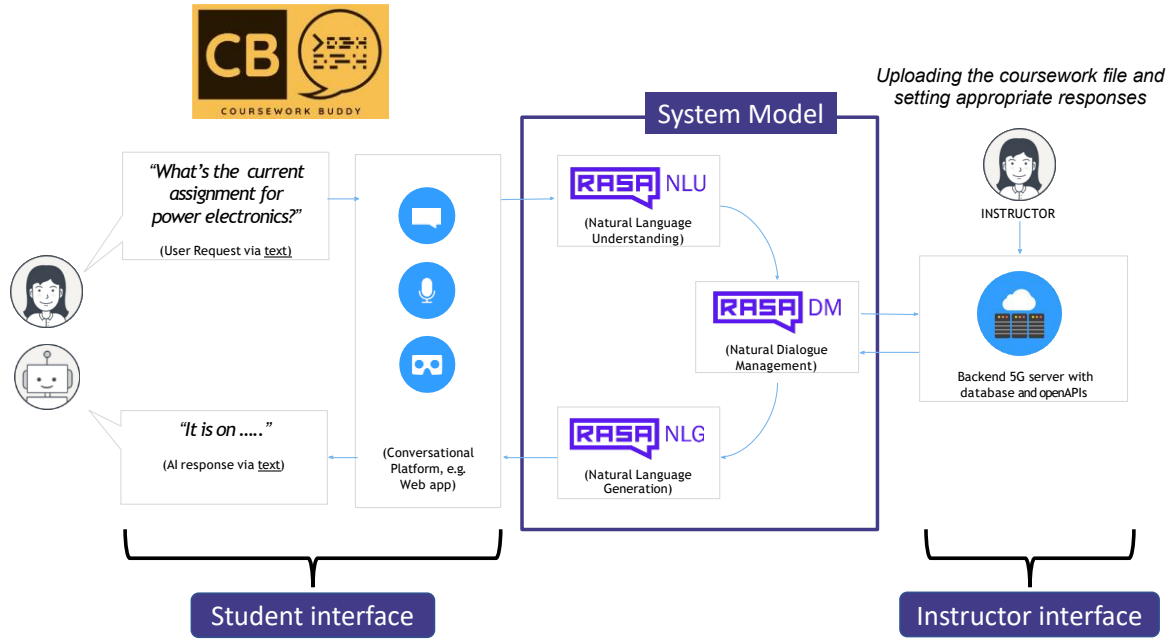

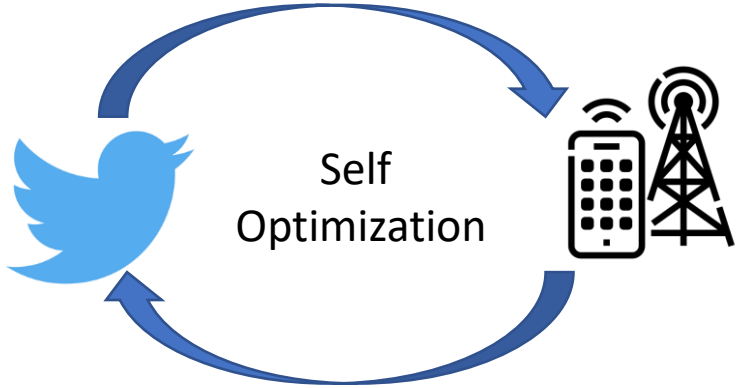

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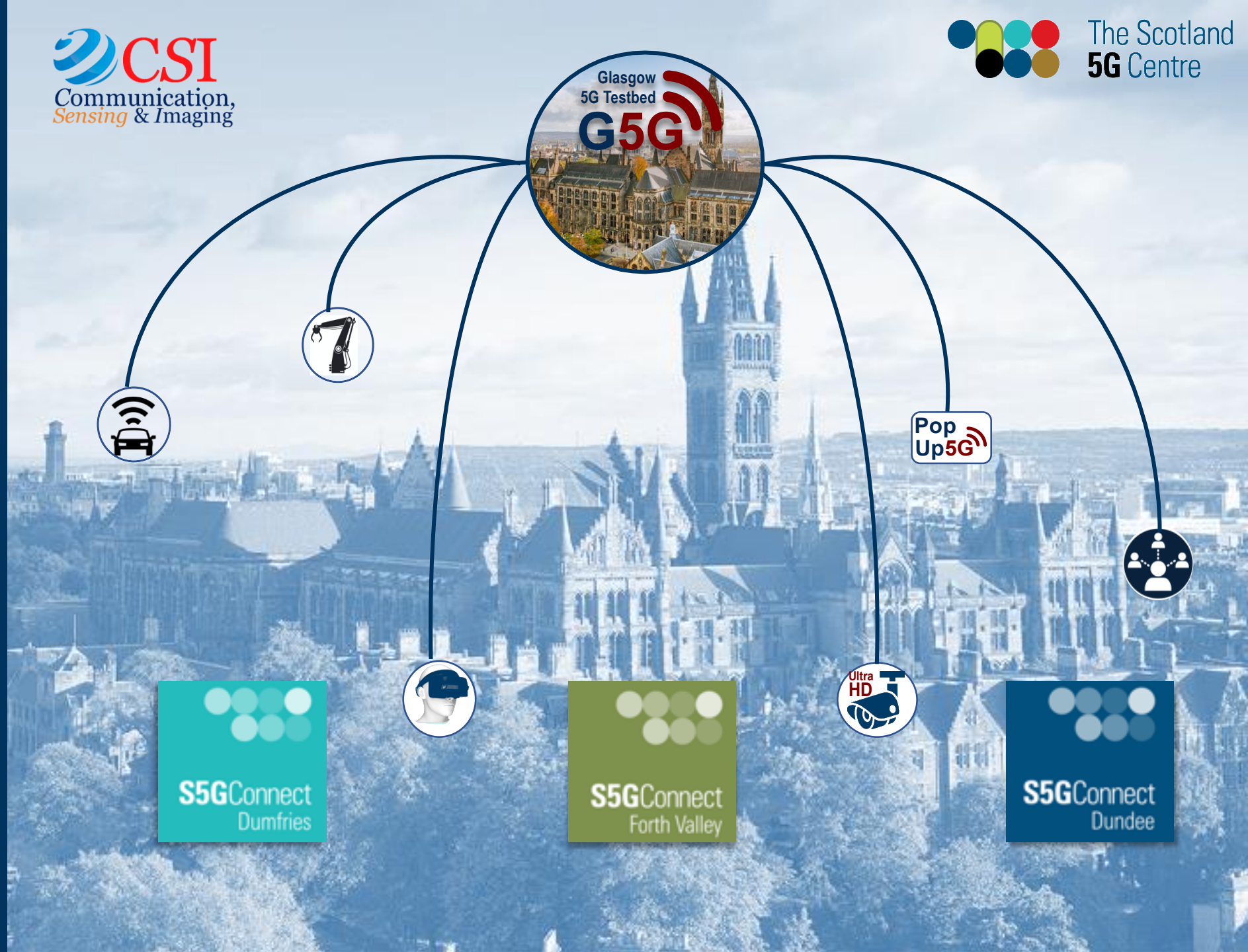
CSI Communication, Sensing & Imaging

The Scotland 5G Centre

5G Urban Digital Innovation



Glasgow 5G Urban Testbed

University of Glasgow

The Scotland 5G Centre

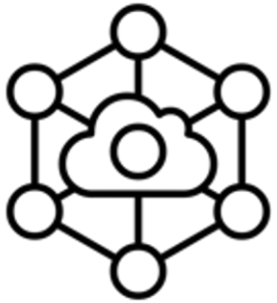
Glasgow 5G Testbed G5G

CSI Communication, Sensing & Imaging

Self Organising Network

Automated configuration, optimization and healing of mobile networks

Internet of Things



Supporting IoT technologies including WiFi-6 and LoRaWAN

A Local Network

Alternative to wired technologies to reduce CAPEX/OPEX

5G Smart Campus

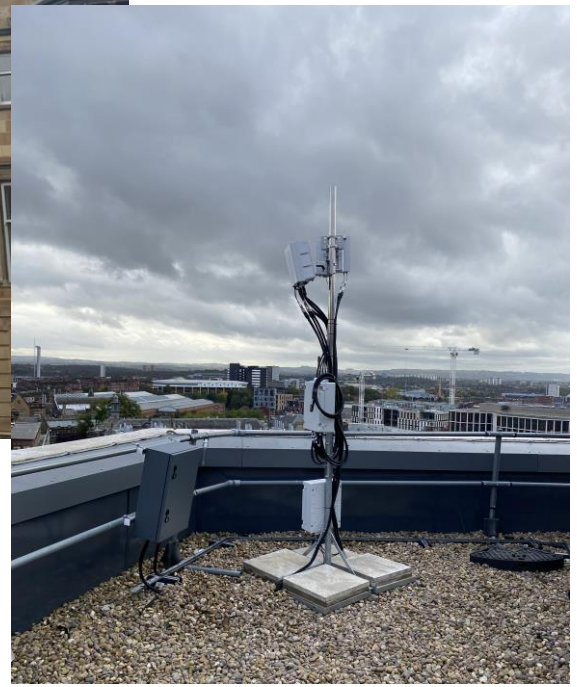
Glasgow 5G Testbed G5G

University of Glasgow

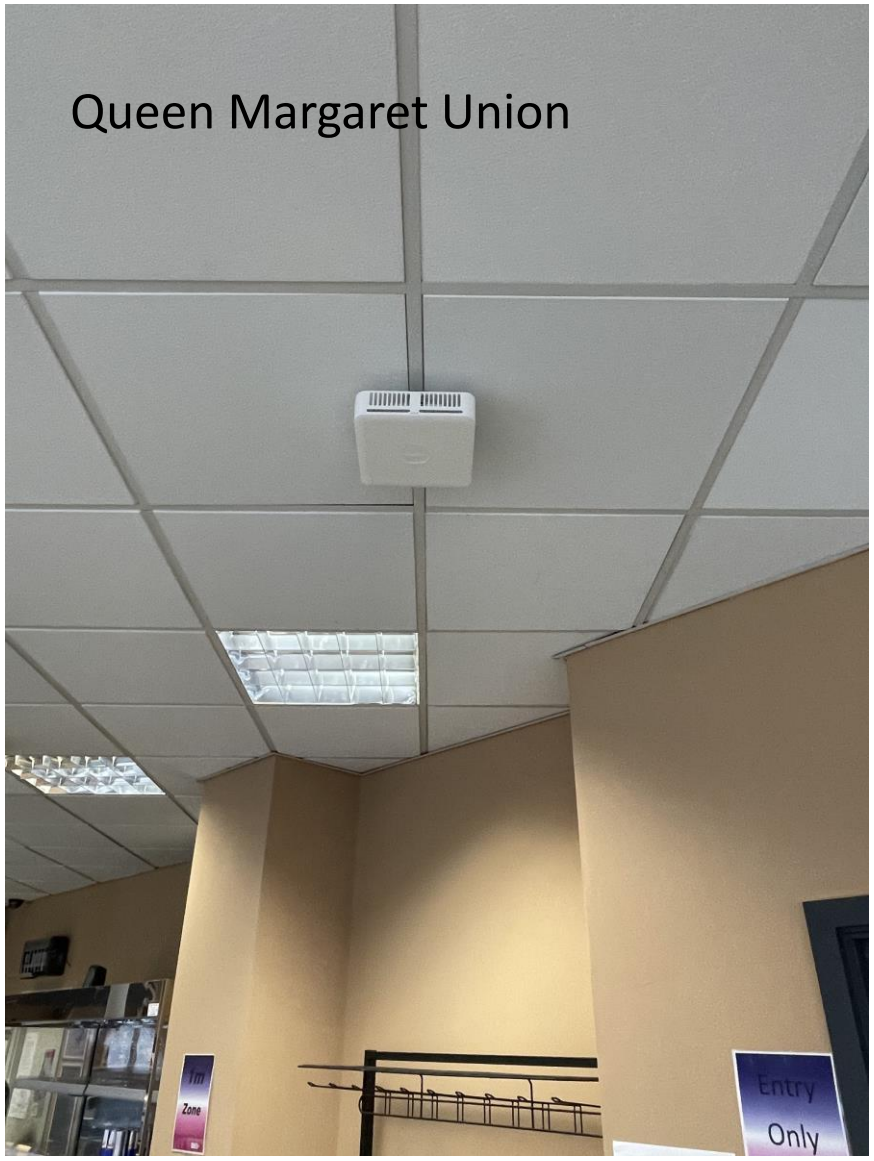
The Scotland 5G Centre

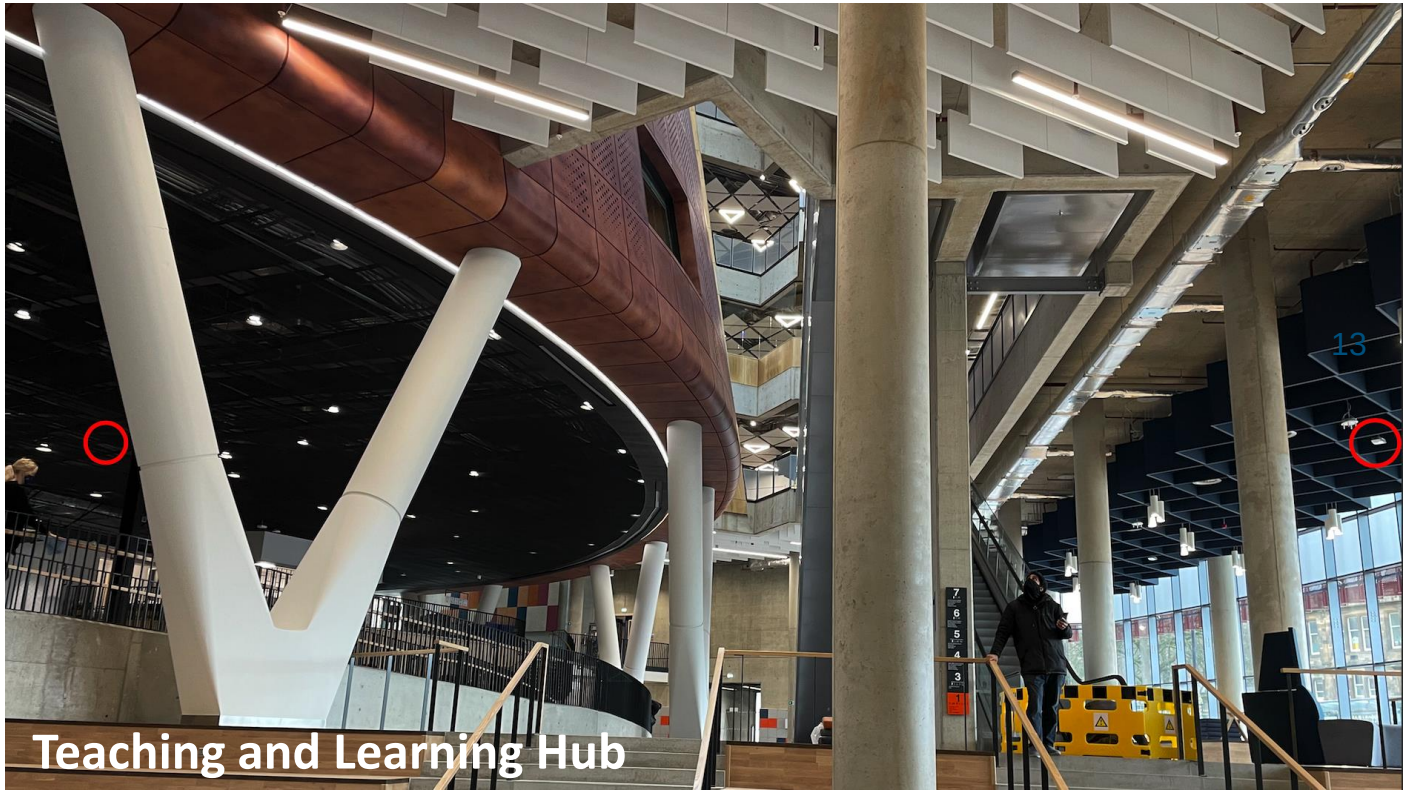
CSI Communication, Sensing & Imaging

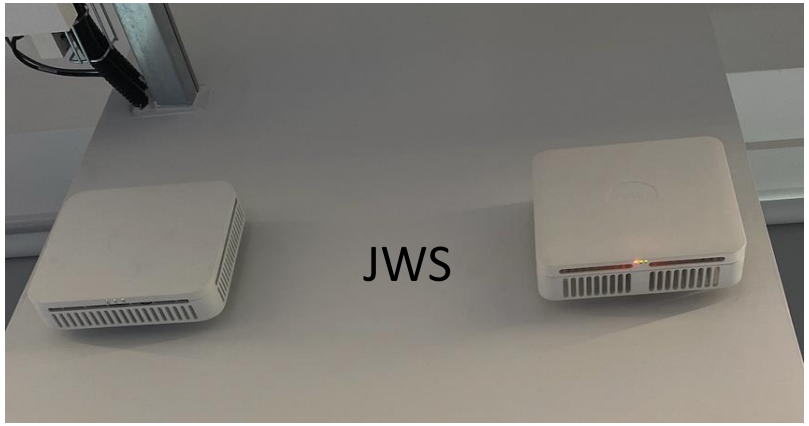
Rooftop Base Stations



Indoor Base Stations







Overview of Use Cases

Scalable Use Cases Platform	Partners	
Contactless Activity Monitoring	5G New Thinking, BT, H&S Alliance Scotland, Quest	URLLC, MEC, eMBB, Smart Mobility Management, QUEST
Live Augmented/Virtual Reality (AR/VR)	Eon Reality, BT, VRtuoso	URLLC, MEC, Education 4.0
Connected Health Devices	Quest, Holoxica, BT	mMTC, Contact tracing, Contactless monitoring, COGMHEAR, Telepresence
Secure IoT Platform	Berringar, Victory Bench (beep trace)	mMTC, RFID Space and Asset Management, Persuasive Energy Conscious Network
Pop-up Network	AWTG, Nokia	SON, Agile deployment
Wireless Control	Shadow Robot Company, Oxford Robotic Institute	URLLC, MEC, AI/ML, Industry 4.0, Education 4.0
V2X	Telefonica, Arwin	URLLC, MEC, AI/ML, Industry 4.0

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