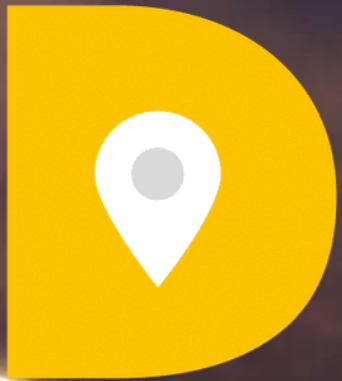


Smart City testbed

Fast-tracking Smart City Innovation



SMART
DCU

A Smart Dublin District



*Kieran Mahon, Smart DCU Projects Facilitator
More info: kieran@smartdcu.ie*

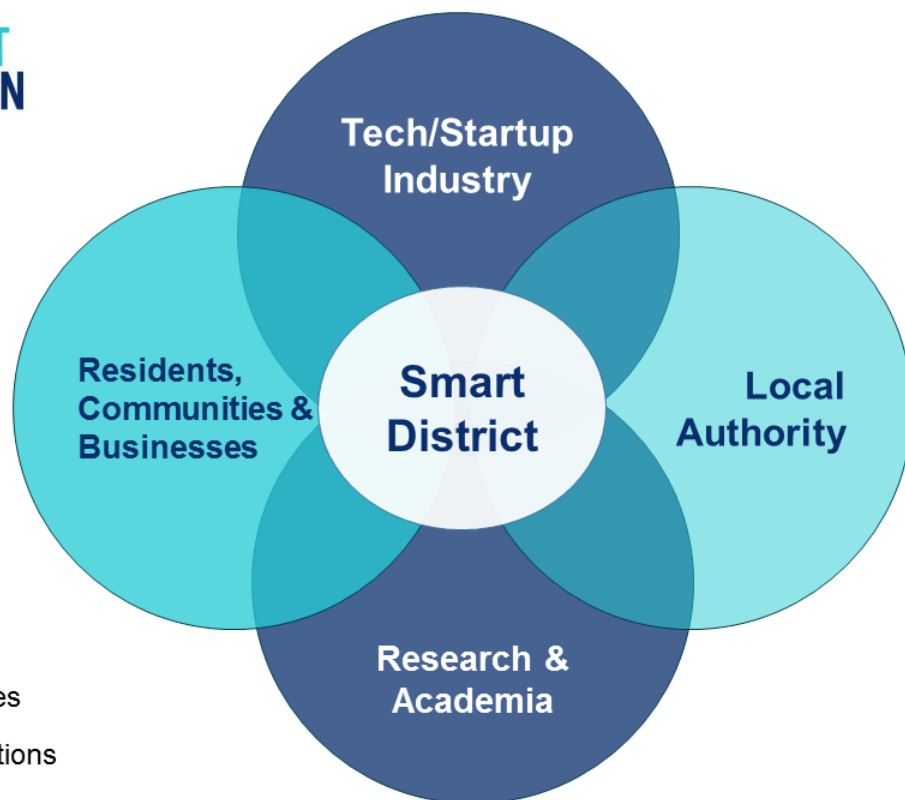


Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



Smart DCU part of the Smart Dublin Ecosystem

Smart Dublin is an initiative of the four Dublin Local Authorities to use new technologies to improve services and enhance quality of life in the Dublin Region



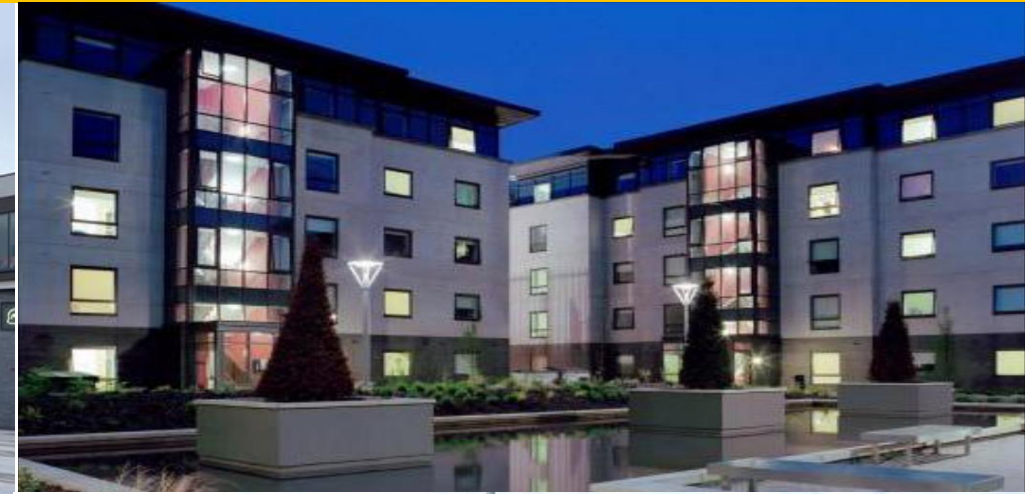
Croke Park Stadium Testbed (83,000 capacity)



University Campus Testbed



Not just a University, a Microcosm of a city



- **Biggest** research centre of its type in **Europe**
- Ireland's **largest SFI-funded** research centre
- Co-led by **DCU**
- Dedicated **Smart City programme** in collaboration with Connect and Lero SFI research centres
- Insight DCU expertise includes:
 - **Machine Learning & AI**
 - **Computer Vision**
 - **Information Fusion**



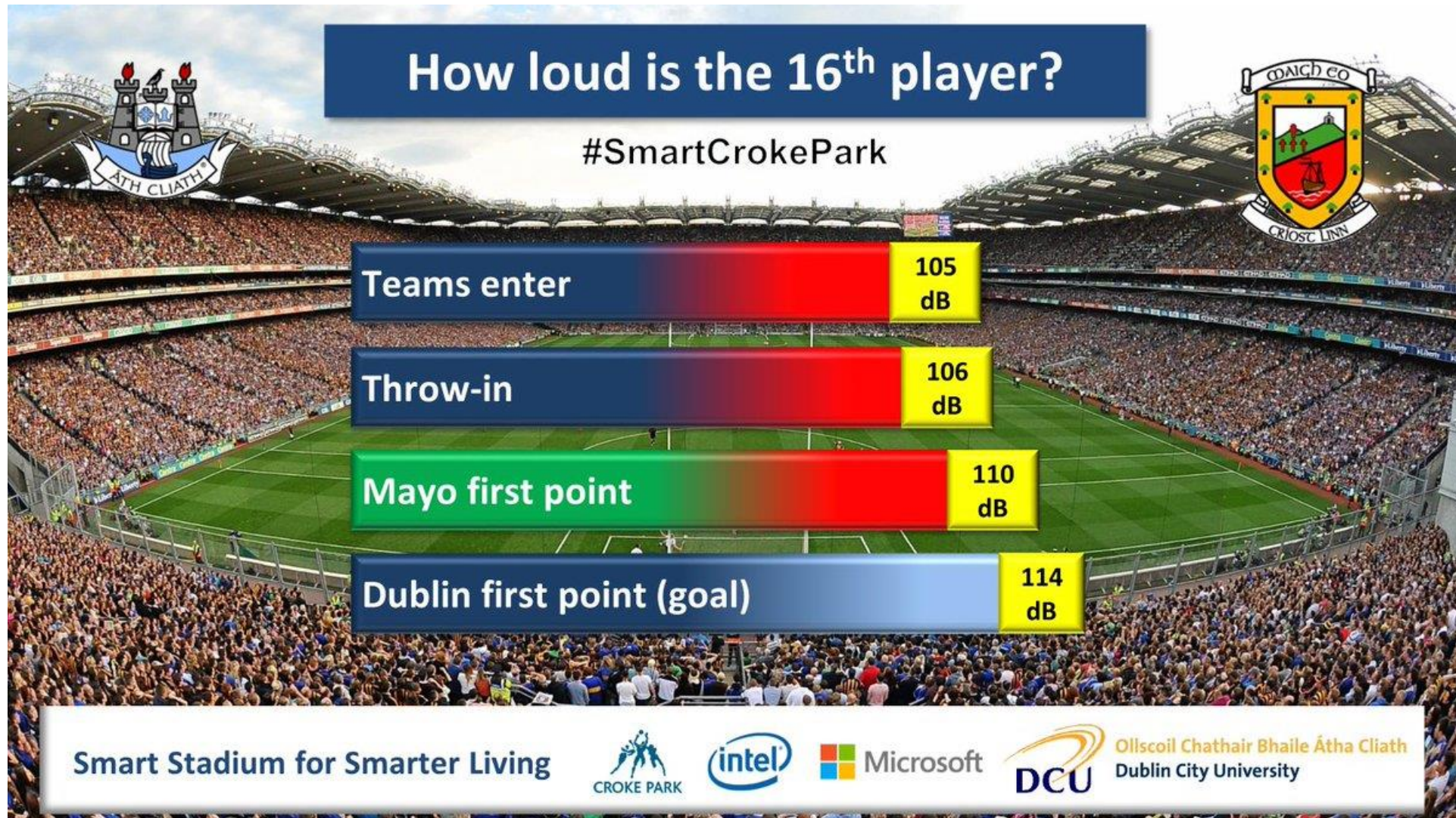
4 Co-Lead Universities Plus 4 partner institutions	Built on 17 of Years of Research in Data Analytics and AI
400+ Academics, Researchers, Engineers & PhD Students	300+ Research Awards won over 4 years
220+ Industry Partners (SFI & EI)	170+ PhD/Masters graduated 250 + by 2019
8 Spinouts 68 License agreements	2000+ Scientific Papers
70+ H2020 consortia. 580+ collaborations in 40 Countries	4 Masters Programs 330 Students per year

**INSIGHT can enhance the value of your Smart
City propositions.**

No data analytics challenge is too big for them

<https://www.insight-centre.org/>

DCU working with Croke Park Smart Stadium for many years



Croke Park Smart Stadium where the ebb and flow of 83,000 fans can be used to stress test Smart City Innovations

Micromobility

Smart DCU piloted Luna E-Scooter precise positioning



Smart DCU pilot



Now deployed in a UK City
(Northamptonshire City Council)

Voi partners with Luna to pilot new AI and computer vision technology for safer riding

NOVEMBER 12, 2020

Nov 2020



Micromobility

Smart DCU piloted **Moby** shared E-Bike intercampus travel



Smart DCU pilot

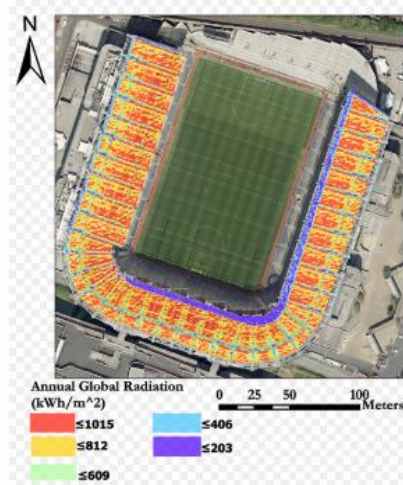
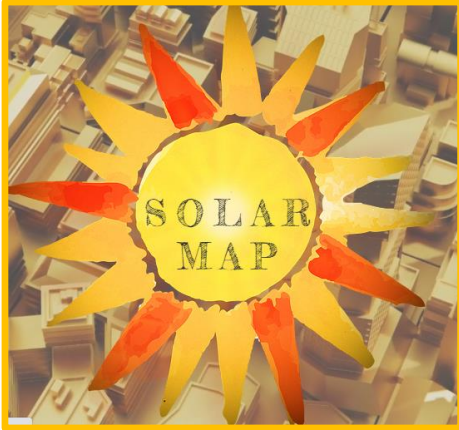


- Now deployed in Dublin City
- Insight Centre of Data Analytics now analysing E-Bike usage patterns

Sustainability

Established relationships

Solar Prospecting expertise



Croke Park roof analysis

Detailed weather station datasets



PV (Battery storage)

Solar Prospecting research



Interest in Solar Prospecting has also triggered interest in understanding how they can collaborate with Smart DCU

Crowd Counting BT RESEARCH CENTRE FOR DATA ANALYTICS

Challenge: How to count people in a crowd without analysing any Personal Identifying Information (PII)

Smart CU has piloted a self contained unit that processes images in real time with no storage of video or images.

Mould Sensors **ambisense**

Challenge: How to ensure good indoor air quality

Smart DCU are piloting the use of Ambisense environmental IoT sensors to report on indoor air quality and the factors that trigger mould.

Both of these projects complement each other as they have the ability to measure indoor (CO2) and outdoor congestion

Crowd Counter



IoT sensors on the Hydrogen Bus



Data Analytics



ambisense
Environmental
IoT sensors over LoRa



Environmental
IoT sensors over Vodafone NB-IoT



WiFi Hotspot



Vehicle telemetry



Location reporting via sigfox



HAL
Self learning IoT sensors

Nota: Imprimir gráfico total e fazer posteriormente o recorte para o indicador de destinos



Navigating the Campus can be stressful for an Autistic person

We are building a seamless Outdoor / Indoor Pathfinder

Indoor location reporting will utilise WiFi 6 Round Trip Time (802.11mc)

IoT sensors will report on sound levels, congestion, etc.

Routing will be in the most Autism Friendly way

Built using the principles of Universal Design (benefit all)



Autism Friendly

Intelligent routing

Customisable interface

AR enhancements

VR route simulations



GPS/GNNS



Environmental sensors



Sound detectors



Crowd Counting



DCU Sport Outdoor Timetable						
Monday June 15th - Saturday July 18th						
Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:00	Body Blast	Spin	Body Blast	Spin	Body Blast	8:00am Spin
9:00	Online Active	Online Active	Online Active	Online Active	Online Active	Online Active
10:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
11:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
12:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
13:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
14:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
15:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
16:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
17:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active
18:00	Spin	Body Blast	Body Blast	Body Blast	Body Blast	Online Active

Students Timetable

2020 Achievements – Bentley funding a Digital Twin Centre of Excellence

Confidential




Smart DCU Proposed Digital Twin Partnership

An innovation initiative by Dublin City University

Smart DCU
Located on the main campus of [Dublin City University](#) (DCU), 'Smart DCU' is one of the [Smart Dublin](#) Districts. It is the perfect microcosm of a Smart City. Every day of the year people live, work and visit. It is a unique district in that everything is controlled and owned by the University. DCU's mission is to be a University of Enterprise and one that is open to working with industry using its campus as a Living Lab. It has well-established strengths in Artificial Intelligence, Data Analytics, Internet of Things and Lab-on-a-Chip technologies. It also offers a taught [Masters in IoT](#).

Based on the United Nations' Sustainable Development Goals, DCU has been [ranked](#) in the top 100 universities in the world for its exemplary positive impact on the social and economic fabric of society. In partnership with global job site [Indeed](#), DCU recently launched a neurodiversity "[toolkit](#)" to assist companies become more inclusive when hiring. It is also the world's first [Autism-Friendly](#) University.



Ollscoil Chathair
Bhaile Átha Cliath
Dublin City University

Ionad Feabhais DCU do Gabhail Sonraí agus Taighde
DCU Centre of Excellence for Data Capture and Research

DCU Centre of Excellence for Data Capture and Research



June 2020 Kieran submitted a proposal to Bentley for a collaborate with Smart DCU

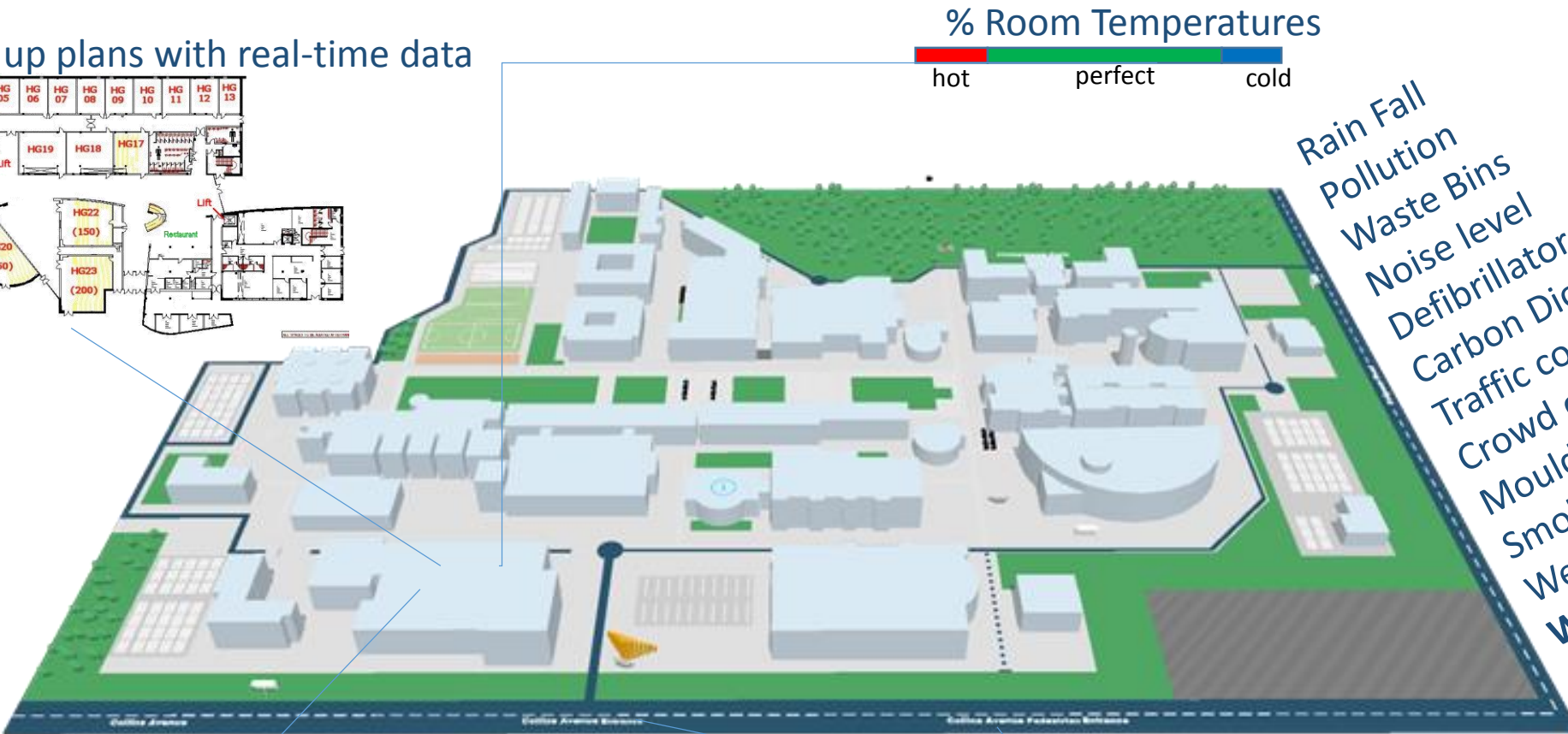
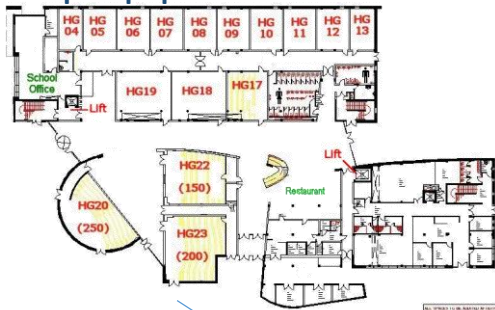


Dec 2020 Bentley has agreed to sponsor a DCU Centre of Excellence

Smart DCU – Building a Digital Twin

We are building 3D model of the Campus that will be overlaid with real time IoT sensor data
To be used for operational efficiency, assist decision making, planning and pathfinding, etc.

Pop up plans with real-time data



Gully status (water level correct)

Adviser to the ‘DCU Future Tech Building’ team

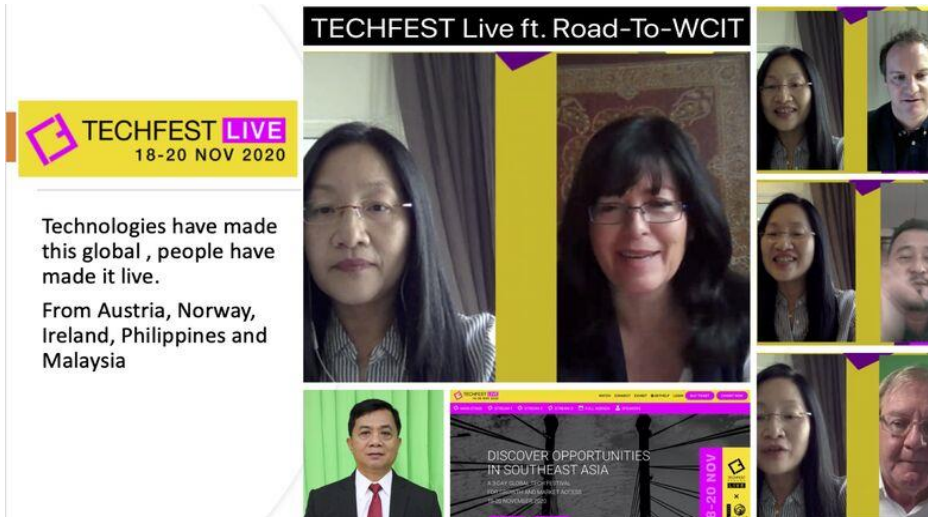
Adviser to the ‘Autism Friendly University Design Guide’ Team

Invited to give a talk on Digital Twins to the DCU Business School

Guest presenter at a South East Asia Conference
(They were very interested in the concept of Smart Districts)



DCU Future Tech Building (2022)



“Technology bringing good to humanity”



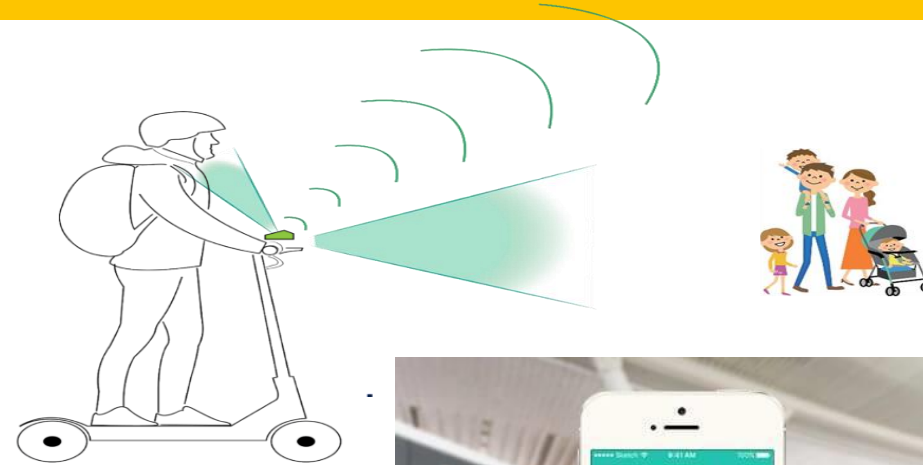
A World's First to be published Jan 2021

New projects

(Working assumptions E-Scooters to be made legal)

☐ Intercampus **E-Scooter sharing pilot**

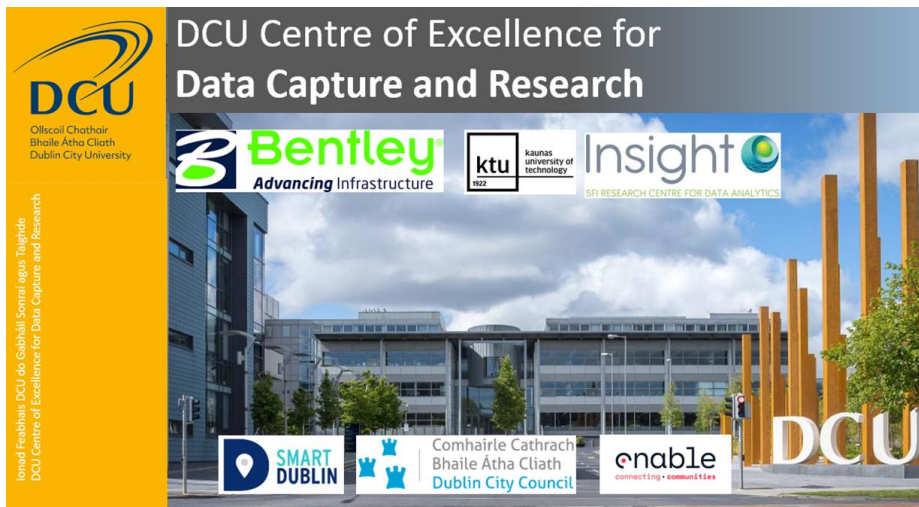
- Computer Vision for hazard detection
- High precision real time location reporting
- Insight Centre of Data Analytics analysis



☐ Seamless **Outdoor Indoor Pathfinding** prototype

☐ DCU become a **testbed** for the **EU Carbon Neutral Cities by 2030** initiative

☐ Establish the **Centre of Excellence for Data Capture and Research**



Smart City testbed

Fast-tracking Smart City Innovation

Kieran Mahon, Smart DCU Projects Facilitator



**SMART
DCU**

A Smart Dublin District

More info: kieran@smartdcu.ie



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Dublin City Council

