Fact Sheet

Singapore Polytechnic: The 5G & AIoT Centre

ABOUT THE 5G AND AIoT CENTRE

The 5G & AIoT (Artificial Intelligence of Things) Centre is set up by Singapore Polytechnic (SP) to assist and enable enterprises to prototype and adopt 5G & AIoT innovation solutions. It is part of the 5G innovation ecosystem in SP, which aims to foster innovations in enterprises through 5G, enabling them to be more competitive in the market.

The Centre develops 5G & AIoT applications that achieve ultra-low latency, high speed wireless connectivity, centralised real-time monitoring, intelligent control, and data analysis. This involves the integration of embedded hardware like sensors or devices and gateways to connections with software cloud platforms and application developments to create a complete end-to-end system.

The SP 5G innovation ecosystem consists of three integrated units:

a) **5G & AIoT Centre** – The Centre focuses on the design and development of 5G & AIoT solutions for enterprises through proof-of-concept (POC) projects leading to adoption.

b) **Singapore 5G & Telecoms Academy** – A joint programme with the National University of Singapore (NUS), and appointed by the IMDA to ascertain the demand, supply and promote 5G manpower development in partnership with other relevant government agencies, industry players and IHLs.

c) **5G Garage** – Singapore's first 5G live test facility set up by SP, Singtel and Ericsson that provides the live 5G network infrastructure to enable development and testing of 5G solutions and hands-on training in SP.

Through these units, SP aspires to grow Singapore's 5G ecosystem and drive enterprises to adopt both 5G and AIoT technologies in their digital transformation journey.

Complementing the Centre is the **5G Learning Journey,** which was launched in partnership with SingTel to allow participants to obtain knowledge in 5G and AIoT technologies to support solution development and gain an understanding of how 5G features are applied across multiple industry sectors and applications.

This is also an opportunity for the participants to engage with domain experts from SP and explore how 5G can be relevant to their businesses and from these engagements, ideate new solutions.

Examples Of 5G & AIoT Use Cases and Projects At The 5G & AIoT Centre

The Centre focuses on enabling 5G in industrial AIoT Proof-of-Concept (POC) use cases for smart facilities in the advanced manufacturing and built environment sectors as well as for facility operations and maintenance purpose.

1. **5G in Advanced Manufacturing**

   1.1. **Digital Twin** – A digital replica of a production line that supports real-time updates, remote monitoring and emergency intervention to halt production.

   1.2. **Remote Field Assistance** – Leveraging on 5G's ability of high bandwidth and low latency, this tool provides real-time guidance to a junior staff by a remote expert.

2. 5G-enabled Smart Facilities in Built Environments

The future of facilities monitoring is going to be alert and event-based in real time. A central landing page will notify facility managers on various real-time critical events within the facilities.

2.1. **Video-analytics Based Carpark Monitoring System** – Configured to detect carpark anomalies such as unauthorised parking in fire engine access areas and reserved lots, this system will trigger an alert, sending a snapshot of events to the command centre.

2.2. **AI Camera-based Fire or Smoke Detection** – Installing an AI camera at high value asset facilities, such as in an aircraft hangar, to visually detect fire or smoke so as to increase emergency reaction time.

2.3. **Facial Recognition Door Access System** – AI cameras can be used to enhance safety and security features, such as facial recognition, at restricted areas.

2.4. **Unmanned Counter Monitoring System** – An unmanned reception counter will be able to detect if service is required from the gestures for assistance received from the visitors at the counter as well as the presence of loitering within the vicinity. This increases the work productivity of office staff as they will only be required to respond to the unmanned counter when necessary.

2.5. **Mass Deployment Of IoT Devices Across Facilities** – Many IoT devices, such as energy meters, temperature, humidity, and occupancy and lighting sensors, will be deployed across facilities to provide insights on how often these facilities have been utilised.

3. 5G in Smart Facility Operations And For Maintenance

3.1. **Inspects For Cracks On Building Façade And Detects Faulty Solar Panel Hotspots** – 5G-enabled cameras mounted on flying drones will replace laborious and dangerous operations such as inspecting building façade for cracks and detecting faulty solar panel hotspots. It enhances workers' safety while maintaining building structure and retaining a higher energy harvest yield respectively.

3.2. **Mask On and Off Or Social Distancing Detection** – An autonomous electric safety vehicle equipped with 5G-enabled cameras will patrol and check on those who flout mask-wearing and social distancing measures at business premises or facilities.

The 5G & AIoT Centre will be officially launched by Minister for Communications and Information, Mrs Josephine Teo, on 17 Nov 2021 in conjunction with the announcement of its plan to run the 5G Learning Journey for Enterprises periodically.

Useful Information

[1] As reported in https://www.businesstimes.com.sg/companies-markets/singtel-ericsson-and-singapore-polytechnic-open-singapore%E2%80%99s-first-live-5g-facility

[2] As reported in https://www.imda.gov.sg/news-and-events/Media-Room/Media-Releases/2020/Mobile-Network-Operators-to-Hire-and-Reskill-1000-Professionals-in-5G

[3] Examples of industry engagement by the centre on industrial use cases shared, https://www.boschsecurity.com/xc/en/news/trends-and-technologies/students-experience-aiot/

[4] Launching of 5G & AIoT centre during SP's RINC 2021 event, https://www.sp.edu.sg/engineering-cluster/eee/rinc/home/programme