Introduction

This poster presents the diverse applications of Reconfigurable Intelligent Surfaces (RIS) in wireless communication, healthcare sensing and localisation. RIS technology enables the surrounding radio environment to be intelligently controlled, improving signal coverage while supporting functions such as contactless vital-sign monitoring, indoor activity and gesture recognition, electric-field exposure control, non-line-of-sight localisation and cellular communication enhancement. The key message is that RIS can serve as a multifunctional platform, rather than only a communication device, by combining connectivity, sensing and environmental control. Demonstrated applications include masked lip-reading, multi-user localisation, vital-sign sensing and outdoor cellular trials. This research could contribute to safer healthcare monitoring, more reliable wireless networks, improved energy efficiency and intelligent environments for future 6G systems.

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Applications of Reconfigurable Intelligent Surfaces (RIS)

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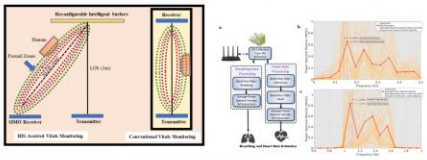
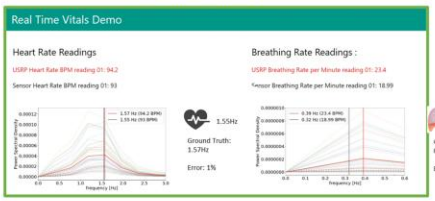
RIS based Sensing for Wireless and Healthcare Application

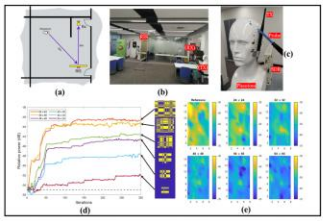
RIS-Assisted Vital Sign Monitoring



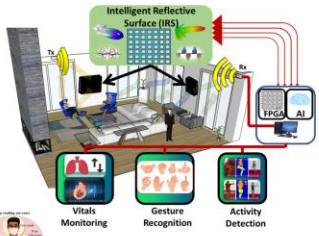
Real Time Dashboard

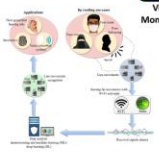


RIS-Assisted E-field Exposure Control



Human Activity Monitoring & Gestures Recognition



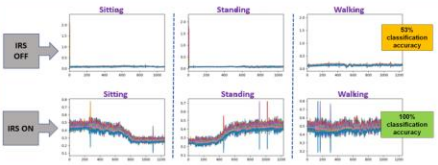


RIS-Assisted RF Sensing for Reading Lips Under the Mask

RIS-Assisted Indoor Activity Monitoring

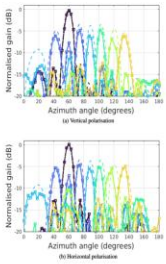
Corridor Junction Scenario

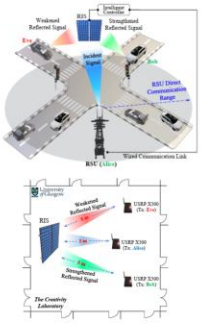
Multi-floor Scenario

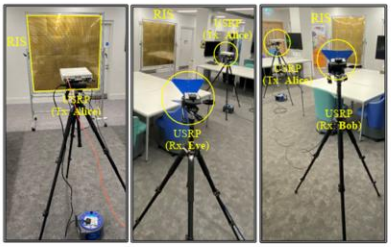


RIS-Enabled Activity Monitoring Results

RIS-Assisted Communication



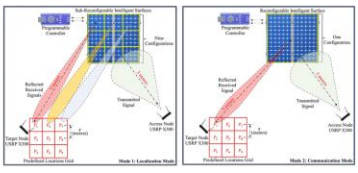




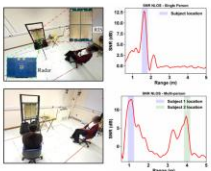
RIS Outdoor Trials for Cellular Communication

RIS-Assisted Localization

An example of RIS-enabled Indoor Localization for Industrial IoT Networks



Depiction of the proposed RIS-Assisted Method



Multi-user Localisation and Vital-sign Sensing in nLOS using X-band RIS

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