

5G NR mmWave Gigabit systems

5G New Radio (5G-NR) in the mmWave bands will explore new ways to achieve high data rates and low latency to user equipment. 5G-NR is expected to provide peak data rates of 10Gbps, supporting 3D immersive viewing systems and telepresence services on mobile devices.

Reduced end-to-end latencies will support new real time interactive applications and ensure ultra-responsive mobile cloud-services. 5G-NR systems will offer highly improved and consistent QoE to users and serve diverse applications, such as multimedia, virtual reality, Machine-to-Machine (M2M) /Internet of Things (IoT), automotive and air drones.

Currently the 26GHz and 28GHz bands are considered by 3GPP 5G-NR for ultra-high speed access and backhaul systems. Apart from analogue beamforming, research in mmWave frequencies considers the combination of analogue and digital processing, known as hybrid beamforming, which benefits from both the array gain provided by the analogue beamforming and the multiplexing gain given by the digital precoding.

Non-orthogonal multiple access (NOMA) techniques allow multiple users to share the same resources and can enhance system capacity and accommodate massive connectivity. The application of NOMA to a hybrid precoding design in mmWave systems will be explored. Scheduling approaches and the design of low-complexity hybrid analogue-digital precoding algorithms for multi-user mmWave systems will be considered.

More Details and Contact:

For informal enquiries please email [Prof Andrew Nix](#) or [Prof Angela Doufexi](#).

How To Apply:

Please submit a PhD application using the University's online application system: <http://www.bristol.ac.uk/study/postgraduate/apply/>. In the application form mention the project title above and list [Prof Andrew Nix](#) under "Proposed supervisor(1)" and [Prof Angela Doufexi](#) under "Proposed supervisor(2)".