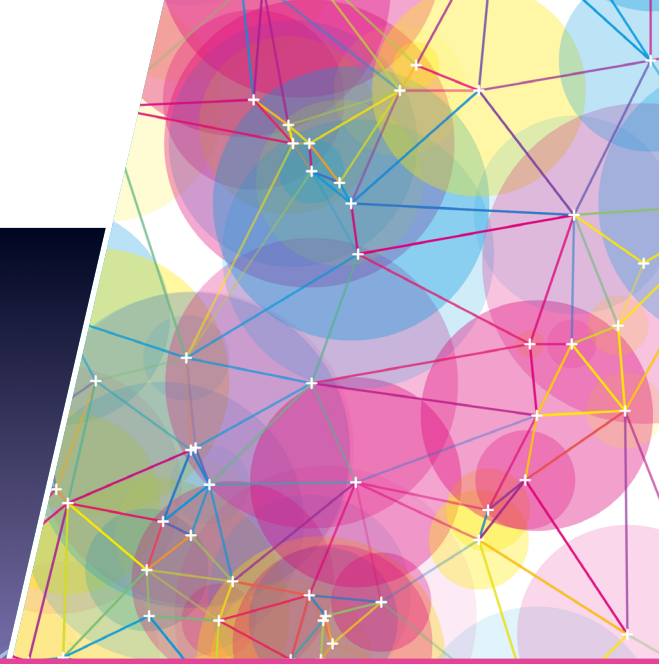




University of
BRISTOL



High fidelity 5G mapping for ultra-reliable
citywide networks

Visualising handset connections to the 5G network

Understanding radio wave interactions with
the environment

Visualisation of RF Spectral Waves

Visualisation of Radio Transmissions

About

Software tools developed at the University of Bristol can estimate how radio signals travel from 5G basestations to your mobile device. By using ultra-high resolution 3D city maps, generated using airborne laser scanners, these new tools will ensure 5G coverage is optimised throughout the city.

Let's Get Technical

Radio waves scatter off buildings and bend around corners and over rooftops depending on their carrier frequency. The University of Bristol is a world leader in the measurement and modelling of radio waves propagation. Today all cellular and Wi-Fi services operate at frequencies below 6GHz. One of the innovations in 5G is the introduction of new 'millimetre wave' bands at 26GHz and 60GHz. These introduce significant new challenges in terms of electromagnetic modelling. As such, high frequencies, the surfaces of buildings become 'electrically rough' and this scatters the radio signals in all directions.

Using ultra-high resolution 3D city models, it is possible to predict how these radio waves travel from 5G basestations to your mobile device. Furthermore, based on the location of a set of basestations, as well as the type of antennas deployed, the software is able to predict radio signal levels at street level throughout the city. These maps can then be used to ensure high-quality and reliable service provision, including for new services such as Smart Cities and Connected and Autonomous Vehicles. The tools in development in the labs at Bristol will be used to support the 5G network planning process. The Smart Internet Lab has also developed a state-of-the-art radio channel emulator, which links to our radio predictions and enables 5G hardware to be fully evaluated in the lab. These facilities are currently being used to develop and deliver Gigabits per second communications as part of a new 5G network for cars and trains.

Smart Internet Lab

The Smart Internet Lab at the University of Bristol is a hub for internet research, which aims to address grand societal and industrial challenges. We perform cutting edge research on optical and wireless communications, offering a unique holistic approach to hardware and software co-design, solving critical problems in the global internet evolution.

5G Research

We are world leaders in fibre, wireless, and 5G convergence research. We have created a unique 5G Trial Test-Bed for a Smart City, Campus, Region and the Telecom Industry.



Challenges
of **exploiting**
5G millimetre
wave spectrum