

## Highly integrated ultra-Massive MIMO system for future wireless communication systems

5G and future wireless communication systems will require disruptive technologies to be deployed to overcome the difficulties of transmitting signals in highly spectral-efficient way for sub-6GHz frequencies and reliably for mm-Wave frequencies.

Massive MIMO systems offer these desired capabilities as it has been already proven by the CSN research team by holding a world record in spectral-efficiency using a massive MIMO system. This was achieved using industry-based hardware for proof of concept. The proposed PhD aims to build a highly integrated massive MIMO system in the form of an active antenna array composed of thousands of radiating elements.

The prototype that will be built will hold a world record in terms of number of elements and efficiency. Firstly, the PhD will investigate the most relevant massive MIMO scenarios in terms of digital and hybrid phased-array architectures.

Secondly, the integration of the RF chain to the radiating elements will be investigated with a robust multi-physics modelling approach in order to come up with a theoretical framework of how to successfully design an active phased-array transceiver. Innovations in multi-parameters nonlinear behavioural modelling and antenna design will be targeted.

### More Details and Contact:

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### 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 [Dr Souheil Ben Smida](mailto:Dr.Souheil.Ben.Smida@bristol.ac.uk) under "Proposed supervisor(1)" and [Prof Mark Beach](mailto:Prof.Mark.Beach@bristol.ac.uk) under "Proposed supervisor(2)".