Dr Rong Zhang is an assistant professor in electronics and computer science at the University of Southampton. He was awarded a Royal Academy of Engineering Industrial Fellowships scheme in 2016, which enabled him to collaborate with BT to investigate novel techniques in digital signal processing.
RESEARCH
Strengthening the UK’s digital infrastructure requires novel solutions for efficient, sustainable data transmission. With significant experience in communications and signal processing, Dr Zhang collaborated with BT through a Royal Academy of Engineering Industrial Fellowship to develop essential techniques for the next generation of broadband access technology.

Building on a previous collaboration with BT, the Industrial Fellowship allowed Dr Zhang to further explore the design of multiple-input and multiple-output (MIMO) methods that enable broadband communications. By combining theoretical simulation-based research with practical experiments, the research identified ways of optimising capacity in state-of-the-art MIMO techniques for copper.

“We have been able to develop access technologies using copper that increase data rates significantly,” explains Dr Zhang. “Our innovative solutions will bring substantial gains to core BT services.”

IMPACT
Through the Fellowship, BT gained direct access to advanced academic research and knowledge, which supported the organisation to address current challenges identified in its research and innovation strategy, relating to future generations of access technologies using copper transmission.

BT’s Head of Access Network Research, Trevor Linney, explains: “Dr Zhang and BT researchers were able to work together and develop superior MIMO techniques with great potential to enhance future technology standards. In addition, by strengthening the research partnership between BT and the University of Southampton, we hope to be able to develop future technology to help meet the bandwidth demands of the UK in a timely and cost-effective manner.”

“My Industrial Fellowship has enabled me to apply novel scientific methods to solve critical industrial challenges, while strengthening my research profile.”

The collaboration meant that Dr Zhang could introduce contemporary industrial case studies into his undergraduate teaching. He is also working with BT on other ways to enhance undergraduate learning through exposure to industry, such as group design projects, industry visits and contributions to job fairs.

PROFESSIONAL DEVELOPMENT
Dr Zhang believes the Industrial Fellowship has had a lasting impact on his career development. “This collaboration has equipped me with skills that have increased my mobility between academia and industry,” he explains. “Expanding my links with industry in this way has also helped me to develop leadership skills.”

The success of the collaboration is evident in their plans to continue working together and apply for funding for projects directly related to the Fellowship. Researchers at BT will also continue to be involved in projects helping support undergraduates to engage with industry.

ROYAL ACADEMY OF ENGINEERING INDUSTRIAL FELLOWSHIP SCHEME
The Industrial Fellowship scheme provides an invaluable opportunity for early- to mid-career academics to undertake a collaborative research project in an industrial environment. The scheme aims to strengthen the strategic relationship between the university and the industry host by providing an opportunity to establish or enhance collaborative research between the two parties and enhance the quality of teaching.