



Dr Filippo Fazi

Research Fellow

**Dr Filippo Fazi** is an associate professor at the Faculty of Engineering and the Environment at the University of Southampton. Between 2010 and 2016, he held a Royal Academy of Engineering Research Fellowship to investigate inverse problems in acoustics with a view to developing novel technologies in professional and consumer audio.



“My Research Fellowship has been the door through which I have entered my academic career.”

### PROJECT SUMMARY

Developments in telecommunications and multimedia have led to people consuming increasingly large amounts of audio material across a variety of devices. This presents several opportunities and challenges in audio, some of which were explored by Dr Fazi during his Fellowship. “The assumption that the majority of people enjoy audio reproduced by a loudspeaker stereo (or 5.1) system while sitting in their living room is no longer valid,” he explains. “We need therefore to evolve the way in which audio material is produced, transmitted and reproduced.”

Whether tackling how to direct sound appropriately on smaller consumer audio devices or looking at the challenges presented by recent technologies such as virtual reality and 3D audio, Dr Fazi has developed a range of techniques that can help respond to emerging needs in acoustics. “I use advanced mathematical tools and computer models to study fields of soundwaves, and I apply this knowledge to develop new technologies to capture and control sound fields using arrays of loudspeakers and microphones.”

### IMPACT

The Research Fellowship provided Dr Fazi with the time and resources to engage and collaborate with a number of academic and industrial partners on projects ranging from purely theoretical exploration to the implementation of new technologies into real products. Working with government agencies and national and international industrial leaders in hi-fi audio and telecommunication has helped

to maximise the impact of his research. “It has been exciting to follow the evolution of our inventions, from simple ideas sketched on a piece of paper to technologies implemented in real devices and products,” Dr Fazi says.

### PROFESSIONAL DEVELOPMENT

Dr Fazi used the time and freedom provided by his Fellowship to define and implement a long-term strategy for his research. The prestige of the award also enabled him to draw on further career development support from the faculty at the University of Southampton, and he was promoted to associate professor when the Fellowship ended.

He now leads an established research group in audio technologies with a growing international reputation. As part of the university’s Institute of Sound and Vibration Research (ISVR), his team currently includes four postdoctoral research students, and one part-time and four full-time PhD students. A further three students recently completed their PhDs. There are plans for the group to expand in the future and there are several grant applications and new projects with industrial partners in the pipeline.

### RAENG RESEARCH FELLOWSHIPS

Royal Academy of Engineering Research Fellowships are designed to promote excellence in any field of engineering. The scheme provides support for high-quality engineers and encourages them to develop successful academic research careers. Research Fellows receive funding for five years and are mentored by a Fellow of the Academy.