Northumbria University NEWCASTLE

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Major funding awards announced for studies into lead poisoning and sonic innovation

Studies to improve the way we monitor and test for lead poisoning in children and communicate data through sound have been awarded more than £1.1 million through a new funding scheme announced today.

Northumbria is the only university in the north of England to have had two projects selected in a new UKRI pilot scheme designed to stimulate exciting new interdisciplinary research across nine different research councils.

The studies will be led by Professors Jane Entwistle and Paul Vickers, both from the University's Faculty of Engineering and Environment, who will work with colleagues across the country to unlock new research approaches and methods that would not emerge from established disciplinary thinking.

Professor Entwistle, interim Faculty Pro-Vice-Chancellor for Engineering and Environment, is leading a study investigating elevated levels of toxic lead in children.

Working with researchers from the universities of Oxford, Bristol and Warwick as well as the UK Health Security Agency, the Health and Safety Executive, Leeds Teaching Hospitals NHS Trust and project partners Synnovis and the LEAPP Alliance, they aim to create a new screening protocol to assess levels of lead in children's blood.

Due to its past widespread use in paint, petrol and plumbing, lead pollution is common in our environment, being found in soil, water, dust, food and the air. Lead poisoning can be hard to detect but symptoms can include developmental delay and learning difficulties, with children most at risk from its harmful effects.

The team intend to develop and test a new approach to screening using an at-home finger-prick test to make it easier and faster to collect blood samples. At the same time, they will ask families to provide samples of house dust and garden soil for testing. This will enable them to assess current levels of lead exposure that will inform and guide UK public and environmental health policies.

They will develop and trial their methods in Leeds. If successful, the methods developed could be used across the UK as part of a national screening programme, as well as used to test for other pollutants and diseases.

Professor Entwistle explained: "Exposure to legacy lead is a hidden burden worldwide and the toxic effects of lead are overwhelmingly observed in children because of their growing and developing brains.

"In the UK, detection in children relies on results of blood tests ordered by physicians only when there is a high clinical suspicion of lead poisoning. As such, most cases of elevated lead are missed in children with no obvious

symptoms. This funding will allow the development of a novel protocol to enable widespread monitoring of the amount of lead in blood."

Dr Lindsay Bramwell, who will be working with Jane on the study, added: "Lead exposure is entirely preventable. The outcomes of this research will support the development of policies that reduce children's contact with lead in the community and at home, allowing children the opportunity to develop to their full potential."

Paul Vickers, Professor of Sonification in Computer and Information Sciences, will lead a study with researchers from Northumbria and Newcastle universities which will create a new hub for sonification innovation.

Sonification is a way of communicating information through sound. While human vision can only focus on one thing at a time, we can track multiple sound sources at once, from any direction, and we can understand and feel different things through sound.

After using sonification to transform computer network traffic into nature sounds, Professor Vickers was recently able to discover a new method of cyber-attack. He generated a soundscape that represented the network's real-time environment and listening to it led to the discovery of a new cyber-attack that had penetrated network defences.

His study will bring together experts in areas such as spatial audio, music, astronomy, culture, materials science and mathematics to explore intangible phenomena through sound. Its aim is to break down interdisciplinary barriers and open new ways of understanding through sound, making the North East a world-leading hub in sonification research.

Professor Vickers explained: "Listening is not limited to the ear – it is inter-sensory and transmodal. We can perceive non-sonic attributes, feel noise in our bodies and we can infer information about intangible things we cannot see by the noises they make, for example, unusual sounds made by a car's brakes tell us a mechanic is needed.

"Sonification lets us select data that we wish to explore or monitor and attach sounds to it, thus bringing the intangible such as distant galaxies, computer network traffic or the earth's magnetosphere into our audible

experience.

“This project will explore how to bring sonification expertise together to form an interdiscipline which has the potential to transform sonification research by removing disciplinary boundaries.”

Almost 900 applications were made for the scheme, with only 36 selected to receive a share of £32.4 million in funding.

Professor Alison Park, Deputy Executive Chair of the Economic and Social Research Council (ESRC) and UKRI Cross Research Council Responsive Mode Senior Responsible Officer said: “The perspectives of different disciplines, working together in collaboration, are vital to solving some of the most pressing problems we face as a society. The UKRI cross research council responsive mode scheme is designed to break down silos and champion research that transcends, combines and significantly spans traditional discipline boundaries.

“The projects announced today will drive progress across diverse fields by creating fresh approaches to research questions, methodologies and ways of working.

“We were all excited to see the innovative and bold approaches being adopted to tackle major issues ranging from climate change to global healthcare and look forward to following their progress.”

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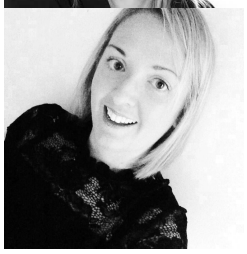

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