Improving product accuracy for sleep disordered breathing diagnosis

Passion for Life Healthcare (UK) Limited

Passion for Life Healthcare (UK) Ltd manufacture and supply products for the treatment of sleep disordered breathing. They partnered on a KTP with Professor Guy Brown, Head of Department in Computer Science at the University of Sheffield, to develop measurement software to distinguish between snoring and background noise. This software was then successfully developed into an app for smartphones so that monitoring can take place at home rather than in a sleep clinic.

“The Knowledge Transfer Partnership has enabled the company to move forward with research that would not have been possible in any other way. The access to world-class academics and leading edge technology has positioned the company well to progress in the area of digital healthcare and the treatment of sleep disordered breathing.”

William Webb, Commercial Director, Passion for Life Healthcare
Sleep disordered breathing was not previously a research focus in the Department of Computer Science. The KTP has opened up this new area of interest for us, allowing us to leverage some of our expertise in audio processing and mobile computing in a new application area. Most importantly, the KTP has allowed us to build an ongoing and mutually beneficial relationship with an innovative SME.”
Professor Guy Brown, The University of Sheffield

**What were the aims of the project?**

Diagnosis of sleep disorder conditions in a sleep clinic can be costly and the environment doesn't provide a natural sleep environment. Simple low-cost in-home testing could bypass these issues and allow for multiple-night studies to be carried out.

Therefore, the aim of the partnership was to develop an accurate acoustic measurement system that can differentiate between the characteristics of snoring and background noise. This software can then be utilised on a smartphone or similar device.

Working with Dr Amy Beeston, the KTP Associate, a recent graduate from the University of Sheffield who completed her PhD in 2015 focussing on speech and hearing, the team hoped to prove that a phone based sound analysis of sleep breathing problems is possible.

**What was achieved?**

Dr Amy Beeston and Professor Guy Brown created a comprehensive literature review and market analysis of current technologies. A collection of recordings of sleep disordered breathing sounds was also collected. All of these developments resulted in a smartphone app allowing sample-accurate streaming of audio over a network for whole-night recordings. Subsequent work funded by Passion for Life Healthcare has developed a number of audio classification algorithms, which are able to discriminate snoring from other sounds with high accuracy. One of these algorithms is currently being implemented in a smartphone app, which will be released in 2019.

**Value to the business?**

As a result of drawing on university expertise working with Amy Beeston and Guy Brown, Passion for Life Healthcare were able to prove that an in-home diagnosis of sleep disordered breathing conditions is possible and practical. The Knowledge Transfer Partnership has increased focus and understanding of the condition and improved the effectiveness of their products. The KTP has also enabled Passion for Life Healthcare to open up new business opportunities in healthcare networks. Through this successful partnership the foundations for future collaborations between Passion for Life Healthcare and the University of Sheffield have been established.

**Value to the University?**

The KTP helped to open up the area of sleep disordered breathing as a research interest in the Department of Computer Science and also helped establish connections between the department and a number of clinical contacts in the UK and internationally.

Following project completion in April 2017, the University continued to worked on additional funded projects with Passion for Life, enabling them to further demonstrate the application of their research and expertise in a real-world setting.

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**Find out more:**

For more information about KTPs at The University of Sheffield please contact **Helen Thorpe** in Partnerships & Regional Engagement

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