

<b>Studentship Title:</b>	PhD in Psychology
<b>Research Area/ Project Title:</b>	Improved stereo separation for bilateral bone-anchored hearing aids.
<b>Location:</b>	School of Psychology
<b>Expected Start Date:</b>	1 <sup>st</sup> October 2018
<b>Duration:</b>	3 years
<b>Deadline for Application:</b>	11 <sup>th</sup> May 2018

**Description of Research Opportunity:**

Bone-anchored hearing aids (BAHAs) restore hearing to patients with hearing losses located in the middle or outer ear. They vibrate the patient's skull, and sound is transmitted directly to the inner ear through the bone. There is a growing market; once made exclusively by our collaborators, Cochlear Bone-Anchored Solutions, bone-conduction hearing aids are now also made by Oticon, Sophono and MedEl. Patients are usually fitted with a single BAHA, because each device stimulates both inner ears; this "cross-talk" limits stereo separation. Stereo hearing is important for telling what direction sounds come from ("sound localisation") and also for understanding speech in background noise.

The project, sponsored by Action on Hearing Loss, will develop a way to fit bilateral BAHAs which deliver better stereo separation using a method called "cross-talk cancellation". Better stereo separation should improve the patient's sound localisation and understanding of speech in noise.

To cancel cross-talk, one needs to have precise measurements of the differences between the waveforms received by each inner ear when each BAHA is activated. We have developed and tested methods for doing this in normally hearing listeners using a bone vibration device. We have also used the data to cancel, at one ear, the noise produced by one bone vibrator, by adding a cancellation signal using a second bone vibrator. The cancellation signal improved the intelligibility of speech presented by the 2<sup>nd</sup> bone vibrator, because the noise had been suppressed at one ear. The next stages are to 1) get the method working in both ears simultaneously using cross-talk cancellation signals for both sides 2) measure the resulting benefit to speech understanding 3) measure the benefits to sound localisation and 4) apply the technique to patients with bilateral BAHAs.

The project has its technical aspects, but is more concerned with psychophysical measurement and software development than engineering.

**Award:**

The studentship will commence in October 2018 and will cover your tuition fees (at UK/EU level) as well as a maintenance grant. In 2018-19 the maintenance grant for full-time students was £14,777 per annum. As well as tuition fees and a maintenance grant, all School of Psychology students receive conference and participant money (approx. £2250 for the duration of the studentship). They also receive a computer and office space, additional funding for their research, and access to courses offered by the University's Doctoral Academy and become members of the University Doctoral Academy.

**Eligibility:**

Full awards (fees plus maintenance stipend) are open to UK Nationals, and EU students who can satisfy UK residency requirements. To be eligible for the full award, EU Nationals must have been in the UK for at least 3 years prior to the start of the course for which they are seeking funding, including for the purposes of full-time education.

As only one studentship is available and a very high standard of applications is typically received, the successful applicant is likely to have a very good first degree (a First or Upper Second class BSc Honours or equivalent) and/or be distinguished by having relevant research experience.

**How to apply:**

You can apply online - consideration is automatic on applying for a PhD in Psychology, with an October 2018 start date (programme code RFPDPSYA).

Please use our online application service at [www.cf.ac.uk/regis/general/applyonline/index.html](http://www.cf.ac.uk/regis/general/applyonline/index.html)

and specify in the funding section that you wish to be considered for School funding.

Please specify that you are applying for this particular project.

**Application deadline:** 11<sup>th</sup> May 2018 with interviews (either in person or by Skype) being held on or around the end of May and decisions being made by June

**General Information:**

The School of Psychology is one of the largest and most successful in the UK (<http://www.cf.ac.uk/psych/>). The School's excellent standard of research and teaching has been recognised in every Research Assessment Exercise. It has its own brain-imaging centre (<http://www.cf.ac.uk/psych/cubric/>), enhancing the international-leading research in behavioural neuroscience, cognitive ergonomics, forensic, social and developmental psychology.

Cardiff is the youngest capital city in Europe and the fastest growing in the UK. It plays host to many national and international sporting events at the Millennium Stadium (<http://www.millenniumstadium.com/>). Culturally, the city is thriving, with the Wales Millennium Centre (<http://www.wmc.org.uk/>) in Cardiff Bay. Cardiff is in very close proximity to the beautiful Welsh countryside (<http://www.breconbeacons.org/>), has a two

hour rail link to London and a (cheap) one hour air link to Paris and Amsterdam  
(<http://www.cardiffairportonline.com/>)

Please address any informal enquiries to:

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**For further information please contact:  
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