Project Title	Use of electrophysiological and structural markers of inter-hemispheric connectivity to model the beneficial effect of noisy galvanic vestibular stimulation upon postural control
Supervisor(s)	Professor Timothy Constandinou (Department of Electrics & Electronic Engineering) Dr Barry Seemungal (Department of Brain Sciences)
Themes	Biomedical Sensing Diagnostics and Imaging Medical Devices
Project Type	Lab based
Project Description	<u>Introduction:</u> Electrical stimulation of the vestibular system – obtained by applying a current to the mastoid processes and is called Galvanic vestibular stimulation (GVS) - enhances postural control, and vestibular perception, in healthy subjects and patients with neuro-degeneration. Our recent data in traumatic brain injury show impaired postural control with disrupted white matter tracts linking the frontal cortices. We hypothesise that the GVS effect upon postural control is mediated by enhanced bi-frontal connectivity. <u>Objectives:</u> 1. Use noisy GVS to modulate vestibular-mediated postural control. 2. Assess changes in bi-hemispheric connectivity with GVS using: a) neuro-navigated motor cortex TMS (transcranial magnetic stimulation) b) interhemispheric coherence changes in EEG. 3. Model the link between intervention (GVS) and function (postural control) using neurophysiological (EEG, TMS) and structural parameters (diffusion tensor imaging) of inter-hemispheric connectivity. This project requires a minimum of 2 students working together (but can accommodate a 3rd student). This project is health themed focusing on brain circuits in health and disease and how this relates to brain disease and diagnosis. You would be working with engineers, scientists and clinicians and both healthy and patient cohorts developing the stimulation devices and analysing the data through appropriate tools. "