Department	**School of Computing**
Supervisors	Shufan Yang
Project Title	AI enhanced perinatal stroke diagnosis

PROJECT DESCRIPTION

Children with perinatal stroke are at increased risk of autism spectrum disorder. The perinatal stroke is a potentially debilitating injury, often under-diagnosed in the neonatal period. At present, there is no definitive treatment, other than symptomatic and supportive measures. The emergence of functional near-infrared spectroscopy (fNIRS) and its extension Diffuse Optical Tomography (DOT) provide an alternative means of achieving a wearable, lightweight, low-cost neuroimaging technology. The PhD candidate will learn how to use AI to build fast diagnostic methods with light weighted electroencephalography EEG + multimodal DOT devices. The PhD candidate will learn advanced optical tomography image reconstruction, machine learning and advanced computer architecture.

Prospective applicants are encouraged to contact the Supervisor before submitting their applications. Applications should make it clear the project you are applying for and the name of the supervisor(s).

Academic qualifications

A first degree (at least a 2.1) ideally in computer science or electronic engineering. with a good fundamental knowledge of software programming, signal processing.

English language requirement

IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. Full details of the University's policy are available online.

Essential attributes:

- Experience of fundamental signal processing
- Competent in software programming
- Knowledge of python programming
- Good written and oral communication skills
- Strong motivation, with evidence of independent research skills relevant to the project
- Good time management

Indicative Bibliography	Zhao, H., Frijia, E. M., Vidal Rosas, E., Collins-Jones, L., Smith, G., Nixon-Hill, R., . . . Cooper, R. J. (2021). **Design and validation of a mechanically flexible and ultra-lightweight high-density diffuse optical tomography system for functional neuroimaging of newborns**. *Neurophotonics, 8 (1)*, 015011. doi:10.1117/1.NPh.8.1.015011
Enquiries	For informal enquiries about this PhD project, please contact s.yang@napier.ac.uk
Web page	https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process