



Sam Parker <samuel.parker5@gmail.com>

RE: An educational modular biosignal acquisition system

1 message

Rick Middleton <richard.middleton@newcastle.edu.au>
To: Samuel Parker <Samuel.R.Parker@uon.edu.au>
Cc: James Welsh <james.welsh@newcastle.edu.au>

Mon, Jun 15, 2020 at 10:21 AM

Hi Sam

Thanks for the ideas below (I'll copy James as Program Convenor for Medical Engineering and also incoming head of discipline.)

So yes, there's always a range of things that could be of interest as kit for Med Eng students here. I'm not sure of competing products (haven't checked recently) and I'm sure (even though it is measurement only) there will be regulatory stuff which you have probably already looked at (isolation amplifies typically etc.). Definitely think there's potential value in this kind of exposure for our students.

Great to hear you're furthering your studies in BCO, EEG based BCI seems to be a really tough area, lots of work for many years, quite limited progress. Many other forms of BCI seem very promising (not exactly sure which area you'll be following at Brown – sounds like a great opportunity).

Best

Rick

From: Samuel Parker <Samuel.R.Parker@uon.edu.au>
Sent: Thursday, 11 June 2020 2:42 PM
To: Rick Middleton <richard.middleton@newcastle.edu.au>
Subject: An educational modular biosignal acquisition system

Hi Dr Middleton,

My name is Sam Parker. I am a 4th year Electrical Engineering student at the University of Newcastle. I am putting the finishing touches on my Final Year Project: A 3D Printed Brain Computer Interface Prosthetic Hand. One of the purposes of the project was to develop the system in an accessible, modular way, so that future students may be able to use the hardware and software developed as a springboard into studying biosignals. Biosignals (in particular their application in neuroprosthetics) are my area of research interest, and I am commencing my Biomedical Engineering PhD in Brain Computer Interfaces at the Carney Institute of Brain Science at Brown University this August.

I have followed the development of the Medical Engineering program at UoN eagerly. Had the program been offered a few years earlier, I would have been the first to sign up! I believe a modular toolkit of hardware and software would be a beneficial resource not only for students studying the medical devices and medical signal analysis majors, but students from a range of engineering programs.

The purpose of my email is to ask, in your perspective, would a modular biosignal acquisition system (for example, an EEG/EMG analog front end, with a standard interface for connection to a microcontroller, with the software to configure and control the module) be a useful education tool for undergraduate students? What aspects (e.g. expandability, high-level or low-level interfaces,

form factor, robustness to EMI) would make one system more useful or effective as an education tool than another? Studies have shown that exposing engineering students not ordinarily exposed to medical devices to biomedical problems can increase entrepreneurial alignment, and foster cross-disciplinary thinking. In your opinion, would a broader exposure to biomedical problems and medical device design be beneficial to engineering students? What benefits or disadvantages would this bring?

I really appreciate your perspective. The intersection of teaching, engineering, and communication is a topic of great interest to me, which I will be pursuing further during my time at Brown.

If you would prefer to discuss this in a quick phone/Zoom call, please let me know, I would be more than happy to arrange this.

Yours Sincerely,

Sam Parker

2020 John Monash Scholar

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