

April 10, 2015

To Whom It May Concern:

RE: Reference letter for Mr. Joshua Bradshaw

I am writing with enthusiastic support for Joshua Bradshaw. As I hope to convey below, he is an intelligent and focused student with engineering acumen beyond his years.

I am a senior scientist at the Hospital for Sick Children and an assistant professor of Medical Biophysics and Medical Imaging at the University of Toronto. Over the past four months, I have supervised Josh on a project that involved hardware design, signal processing and associated software development. Specifically, the goal was to use existing fiber-optic pressure sensors to monitor arterial blood pressure in real-time, and process these waveform to trigger the data acquisition of an MRI scanner.

Through this project, Josh has demonstrated a strong practical knowledge of electrical engineering and a disciplined approach to his work. His accomplishments, in just three months, include:

- designed, prototyped and printed a circuit board for triggering the MRI scanner
- specified all electronic components after contacting vendors directly and reviewing online resources
- implemented a peak-detection algorithm from literature, with constraints of low latency and robustness to noise and baseline drift
- designed and built the hardware enclosure and controls for the device
- tested the finished device using a variety of pre-recorded physiological traces

I wish to emphasize that Josh has accomplished all of this independently with only broad instructions from me. At this point I have no concern giving him high level goals and leaving him to his own devices. Finally, Josh has kept meticulous documentation of his work, which will be a great resource for our lab and others as we use and adapt the tools he has created.

In conclusion, I strongly recommend Josh Bradshaw for your advertised position, and would be happy to answer any additional questions by phone or email. He is a remarkable student that will benefit whichever group recruits him – I would love to have him back in the lab one day.

Warm regards,



Chris Macgowan, Ph.D.
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