
Department of Mechanical Engineering

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Re: Letter of Recommendation for Dr. Joel Balmer

To Whom It May Concern:

20 November 2019

I am writing to provide you my very strong reference for Dr Joel Balmer. Joel has worked with me in the Dept of Mechanical Engineering at the University of Canterbury (New Zealand), as a PhD student and researcher, as well as being a lead TA and tutor for my classes and several others.

Dr Balmer spent the prior 4 years as a fully funded MedTech Centre of Research Excellence (CoRE) Research Associate studying the modeling of cardiovascular mechanics for clinical application to personalise and improve outcomes in managing the heart and circulation. I would note the research was highly successful, leading to novel computational modeling and signal processing paradigms that allow direct estimation of heart function and stroke volume without additionally invasive catheters – a “holy grail” outcome in intensive care medicine, where such measures are too invasive to do to patients.

Dr Balmer was highly independent and completely led the research, including technical development, trials and clinical validation of the technology. His responsibilities included:

- Leadership of the project, in both technical content and direction, as well as linking with doctors to ensure the direction of the research was clinically relevant.
- Development of all computational methods, including a range of advanced signal processing and modeling tools in both Python and Matlab. His research is a diverse and multi-disciplinary clinical-engineering mix, as well as diverse in the technical and computational skills it requires.
- Publication of outcomes, where this form of delivery is a critical element in a university setting, but also a clear indication of “completion”, the ability to provide independent peer-reviewed outcomes. In this area, he was a major leader with 7 journal articles (3 as first author) and numerous conference articles, including also major prizes. These are clear indicators of his ability to deliver results to a high standard.
- Clinical validation. Use of clinical data to validate the methods, which is a further form of independent validation and a major element of any research and engineering project.

Dr Balmer’s project was particularly complex due to its broad technical scope and clinical application. Dr Balmer showed outstanding capability in leadership of this project, both in hands-on technical innovation and development, and in building and managing interdisciplinary research with clinical professionals in NZ and internationally to achieve and exceed project goals. Under Dr Balmer’s leadership, the project progressed from an idea with initial concept proving results to a prototype system ready for human trials. This is an extraordinary effort and outcome.

It has been a great pleasure working with Dr Balmer over the last 4 years. His interpersonal and written communication skills are outstanding. His project management and interpersonal skills in particular have allowed him to create pleasant and productive working relationships with everybody involved across a huge range of disciplines. Especially noteworthy are his skills in engaging at all levels with clinical, technical and business partners alike, as well as his ability to teach and deliver knowledge to students which translates well to any industry or educational sector.

Overall I very strongly recommend Dr Joel Balmer as a highly competent and extremely talented professional engineer and researcher. He met or exceeded every milestone and expectation over several years despite a very difficult and limited funding and resource environment.

Please feel free to contact me directly if you have any further questions. Thank you for your time and consideration.

Best Regards,

A handwritten signature in blue ink, appearing to read 'J. Geoffrey Chase'. The signature is fluid and cursive, with a large initial 'J'.

Distinguished Professor J. Geoffrey Chase, FRSNZ, FASME, FEngNZ
Email: geoff.chase@canterbury.ac.nz