Preface

A novel partnership between surgeons and machines, made possible by advances in computing and engineering technology, could overcome many of the limitations of traditional surgery. By extending surgeons' ability to plan and carry out surgical interventions more accurately and with less trauma, computer-integrated surgery (CIS) systems could help to improve clinical outcomes and the efficiency of health care delivery. CIS systems could have a similar impact on surgery to that long since realized in computer-integrated manufacturing (CIM). Mathematical modeling and computer simulation have proved tremendously successful in engineering. Computational mechanics has enabled technological developments in virtually every area of our lives. One of the greatest challenges for mechanists is to extend the success of computational mechanics to fields outside traditional engineering, in particular to biology, the biomedical sciences, and medicine.

Computational Biomechanics for Medicine Workshop series was established in 2006 with the first meeting held in Copenhagen. The sixth workshop was held in conjunction with the medical image computing and computer assisted intervention conference (MICCAI 2011) in Toronto on 2011 September 18. It provided an opportunity for specialists in computational sciences to present and exchange opinions on the possibilities of applying their techniques to computer-integrated medicine.

After rigorous review of full (8–12 pages) manuscripts, we accepted 12 papers, collected in this volume. The proceedings also include abstracts of two invited lectures by world-leading researchers Professor Andrew D. McCulloch from the University of California San Diego (La Jolla, CA, USA) and Professor Juan Cebral from Center of Computational Fluid Dynamics, George Mason University (Fairfax, VA, USA).

Information about Computational Biomechanics for Medicine Workshops, including Proceedings of previous meetings, is available at http://cbm.mech.uwa.edu.au/.

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