



THE UNIVERSITY OF
MELBOURNE

Melbourne Engineering Research Institute (MERIT)

MERIT 2010 Research Summary

Front cover (clockwise from top left): Dr Emma Prime in the Polymers Laboratory; Professor Rajkumar Buyya in the Cloud Computing and Distributed Systems (CLOUDS) Laboratory; Professor Michael Brear with a hydrogen-fuelled combustion engine; Dr Andrea O'Connor with Nicolín Tirtaatmadja (PhD student) and Rachel Savio (BE/BSc student) developing biomaterials for tissue engineering.

Back cover (clockwise from top left): Images representing: Biomedical Engineering; Information and Communication Systems; Sustainable Systems and Energy; and Structured Matter.

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Published by: Melbourne Engineering Research Institute (MERIT), Melbourne School of Engineering

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November 2009

www.eng.unimelb.edu.au/research/

www.merit.unimelb.edu.au

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Foreword

Welcome to the second edition of the Melbourne Engineering Research Institute (MERIT) Research Summary. The 2010 MERIT Research Summary provides a snapshot of the work being undertaken by MERIT researchers at the Melbourne School of Engineering.

Engineering is likely to dominate the 21st century in the same way science dominated the 20th century in terms of discovery and technological advancement. MERIT is a key driver in many research areas such as: nanomaterials; biomechanics; targeted drug delivery; water management; carbon capture technology; climate change; and management and control of bushfires, to name a few.

MERIT consolidates its research into four independent but closely aligned research themes, unified by the common goal of 'engineering research for the benefit of society'. The four themes are:

- Biomedical Engineering – in support of medicine and health;
- Information and Communication Systems – underpinning the future of information sharing, collaboration, education and business;
- Structured Matter – the role modern materials play in our world; and
- Sustainable Systems and Energy – the future of water, energy and the environment.

Each theme continues to build on its key research directions, which include: establishing Centres of Excellence; developing strong support and collaboration with industry and government; and creating a quality research environment that attracts world-class researchers and research students.



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MERIT Research Centres and Laboratories

Australian Research Council (ARC) Special Research Centres

Particulate Fluids Processing Centre (PFPC)

<http://www.eng.unimelb.edu.au/research/centres/PFPC/>

Centre for Ultra-Broadband Information Networks (CUBIN)

<http://www.eng.unimelb.edu.au/research/centres/cubin/> incorporating the Photonics Research Laboratory (PRL) <http://www.ee.unimelb.edu.au/research/prl/index.html>

Co-operative Research Centres (CRCs)

eWater CRC

<http://www.eng.unimelb.edu.au/research/centres/ewater/>

CRC for Greenhouse Gas Technologies (CO2CRC)

<http://www.eng.unimelb.edu.au/research/centres/CO2CRC/>

CRC for Irrigation Futures

<http://www.eng.unimelb.edu.au/research/centres/irrigationfutures/>

CRC for Polymers

<http://www.eng.unimelb.edu.au/research/centres/polymers/>

CRC for Spatial Information (CRC-SI)

<http://www.eng.unimelb.edu.au/research/centres/spatial/>

Other Centres and Laboratories

Advanced Centre for Automotive Research and Testing (ACART)

<http://www.eng.unimelb.edu.au/research/centres/acart/>

ARC Centre of Excellence – Design in Light Metals

<http://www.eng.unimelb.edu.au/research/centres/lightmetals/>

ARC Research Network on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP)

<http://www.eng.unimelb.edu.au/research/centres/ISSNIP/>

Australia-China Centre on Water Resources Research

http://www.merit.unimelb.edu.au/Research_Groups/Aust_China/index.html

Centre for Nanoscience and Nanotechnology (CNST)
<http://www.eng.unimelb.edu.au/research/centres/CNST/>

Centre for Spatial Data Infrastructures and Land Administration (CSDI&LA)
<http://www.eng.unimelb.edu.au/research/centres/CSDILA/>

Cloud Computing and Distributed Systems (CLOUDS) Laboratory
<http://www.eng.unimelb.edu.au/research/centres/Gridbus/>

Melbourne Systems Laboratory (MSL)
<http://www.eng.unimelb.edu.au/research/centres/MSL/>

National ICT Australia (NICTA)
<http://www.eng.unimelb.edu.au/research/centres/NICTA/>

NHMRC Centre of Clinical Research Excellence – Gait Analysis and Gait Rehabilitation
<http://www.eng.unimelb.edu.au/research/centres/GaitLab/>

Neuroengineering Research Laboratory
<http://www.eng.unimelb.edu.au/research/centres/Neuroengineering/>

Peer-to-Peer Networks and Applications Research Laboratory
<http://www.eng.unimelb.edu.au/research/centres/P2Pnetworks/>

Research Network for a Secure Australia (RNSA)
<http://www.eng.unimelb.edu.au/research/centres/RNSA/>

Signals and Systems Research Laboratory
<http://www.ee.unimelb.edu.au/research/ssl/index.html>

Uniwater
<http://www.eng.unimelb.edu.au/research/centres/uniwater/>

University of Melbourne Research Institutes

Energy Institute
<http://www.energy.unimelb.edu.au/>

Institute for a Broadband-Enabled Society (IBES)
<http://www.broadband.unimelb.edu.au/>

Melbourne Materials Institute (MMI)
<http://www.materials.unimelb.edu.au/>

Melbourne Sustainable Society Institute (MSSI)
<http://www.sustainable.unimelb.edu.au/>

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