MedTech Flagship: Assistive Technologies

Thor Besier  
University of Auckland

Nicola Kayes  
AUT University
Assistive technologies integrate and translate knowledge from engineering, design, rehabilitation and health psychology to develop solutions that work for the people who need them.

Our vision is to couple personalised data with computational models and appropriate behavioural change to enable those experiencing disability to manage their own long-term health, and reduce the burden of health care.
Who are our team members?

**THE UNIVERSITY OF AUCKLAND**

Thor Besier
Angus McMorland
Winston Byblow
Iain Anderson
Andrew Taberner
Bryan Ruddy

**AUT UNIVERSITY**

Paula Kersten
Nicola Kayes
Duncan Babbage
Brian Robinson
Stephen Reay
Dave Parry

**Callaghan Innovation**

Marcus King
Kit Wong
Gregor Neumayr

**Industry partners**

Im-Measure-U
StretchSense
Im-Able

**VICTORIA UNIVERSITY OF WELLINGTON**

Edgar Rodrigez
Kah Chan
Will Browne
What healthcare problem do we address?

- Patients recovering from stroke and traumatic brain injury
  - Facilitating engagement and behavioural adaptation
  - Measure and monitor movement in the home
  - Improve rehabilitation strategies to maximise recovery
  - Facilitate and accelerate rehabilitation using robotic exoskeletons

- Spectrum of assistive technologies...
Engagement and behavioural adaptation

A smart phone App to facilitate engagement in rehabilitation and develop skills for managing long-term health and well-being
Measuring and monitoring motion

A software platform that integrates low-cost wearable sensors with computational models of the musculoskeletal system
Controlling robotic exoskeletons

A real-time computational model of the upper limb that uses muscle synergies from EMG to predict forces and motion
What are the challenges?

**Technical**
- Mobile computing power
- Bluetooth bandwidth
- Modelling the shoulder

**Clinical**
- A complex neurological population
- Bridging
  - Technology and health
  - Researchers, clinicians and patients
- Ensuring the solution fits the problem