A novel and potentially revolutionary method to generate X-ray Computed Tomography (CT). This system has greatly reduced radiation risk to patients, improving significantly on current limitations.

- Low Dose Radiation: up to 100x lower than current CT
- Single shot X-ray CT
- True 3D and 4D (real time) dynamic volumetric imaging
- Potential to revolutionise CT scans

THE CHALLENGE
Use of CT scans for medical diagnostics is increasing, with an expected world market value of $5.1 billion in 2017. CT scans have the disadvantage of producing more than 100 times the radiation of X-rays, with reports of increased risk of cancer (1 in 2,400 to 1 in 11,000). This results in reduced application of the technique for clinical use, particularly in certain market segments such as paediatrics.

We are developing novel algorithms for next generation CT Scanners with greatly reduced radiation risk to patients, improving significantly on current limitations.

THE TECHNOLOGY
Our novel 3D / 4D single projection angle X-ray CT system uses simultaneous measurement of X-rays that are both scattered within, and transmitted through, the target object.

The technology uses a unique system geometry composed of multiple collimated and non-collimated position resolving radiation detectors. It encompasses image reconstruction combining radiographs formed from the scattered and transmitted X-rays to recover the 3/4-D estimate of the object.

We have demonstrated ‘proof of concept’, creating mixed data radiographs using CERN’s Monte Carlo simulation platform (Geant4 and a custom C++ image reconstruction program). Under these conditions a test object representing a simple model of the torso containing a combination of air, tissue and bone was shown to be recoverable from a single static X-ray projection (Figures 1-4).

Importantly, this technology has the potential to revolutionise CT medical imaging.

The research team is supported by Monash University (Internal Disciplinary Research Fund - Major award) and by an Australian National Health and Medical Research Development Grant, to develop a prototype to demonstrate the technology.

Our lead scientists on this work are Dr Jeremy Brown and Dr Marcus Kitchen.

Intellectual property: AU provisional filing: “A Tomography System”.

THE OPPORTUNITY
We are actively seeking a partner to license this technology.

Figure 1: Images from SSXT system, working in real-time displayed 4-D fluoroscope mode
(a) the phantom; (b) Standard transmission radiograph; (c) Scatter projection: top view;
(d) Scatter projection: lateral view.

KEY CONTACT
Dr Angeline Batholemuez
Business Development Manager
Monash Science
T: +61 3 9905 4613
E: angeline.bartholemuez@monash.edu