

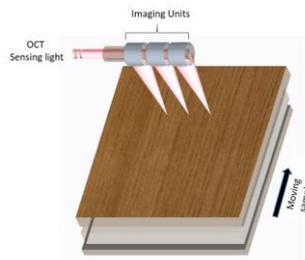
# Multi-positional Surface Diagnostic: A Novel Optical Coherence Tomography Probe

## BACKGROUND

There are a multitude of applications requiring the characterisation of surface morphology/imperfections, dynamic movement of surfaces, accurate measurement of the geometry of complex structures, and particle flow in channel regions that are inaccessible. A desirable requirement for these systems would be the provision of high resolution images at multiple sites, simultaneously, making characterisation more rapid while at the same time, of high accuracy. Effective characterisation of such features currently relies on either rudimentary intrusive instrumentation or expensive imaging techniques such as X-Ray, CT or ultrasound. Both ultrasound and CT provide generally poor image contrast and can be expensive, while X-ray emits harmful radiation. For the imaging of biological geometries, MRI is a possibility, but is extremely costly, and not portable.

## OUR SOLUTION

We have designed a **novel multi-channel Optical Coherence Tomography (OCT)** device that produces a range of “dynamic” measurements that conventional single channel OCT devices are unable to provide. It has the capability to measure geometric surface information at an axial resolution of 20.84µm over multiple target sites, simultaneously. The system has the capabilities to measure surface



features (surface finish, geometric tolerance) and can also provide dynamic information on particles or dust that may be flowing over or depositing on to the surface channel.

## TECHNOLOGY APPLICATIONS

### ✓ Non-destructive testing (NDT)

Measurement of surface finish and surface imperfections either during or after a manufacturing process or as a means to monitor wear and tear (e.g. corrosion).

### ✓ Accurate measurement of geometric tolerances

Measurement of the eccentricity or geometric consistency of an extrudate or any manufactured product, i.e. a cheap technique enabling highly accurate measurements of the straightness or curvature of a manufactured product at multiple locations.

### ✓ Chemical processing or pharmaceuticals

Dynamic characterisation of particle flow and deposition onto a surface and capabilities to simultaneously measure the average velocity of particles prior to their deposition.

### ✓ Biomedical applications

Accurate measurements of geometry and deformation of any biological conduit and simultaneously providing pressure measurements. Specifically, this device will be useful for clinical assessment and also research of upper airway diseases such as obstructive sleep apnoea.

Stage of development: Prototype testing. Opportunity to influence its development and future patentable IP

## INTELLECTUAL PROPERTY POSITION

PCT patent application. Inventors: Taye Mekonnen, Shaokoon Cheng, Jason Amatoury, Agisilaos Kourmatzis

## PARTNERING OPPORTUNITY

We are seeking an industry partner for further development and commercialisation of this technology for a specific application through a research collaboration or technology license.

## WOULD YOU LIKE TO KNOW MORE?

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ADVANTAGES	
Device Design	Longitudinal distribution of multiple scanning heads
System Cost	System's cost per channel is minimal as a beam from single broadband light source is split and distributed to different channels
Imaging and Data	Simultaneous imaging of geometric features at different points
Scalability	- Integration of further functions (particle velocities) - Adjustable number of channels

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