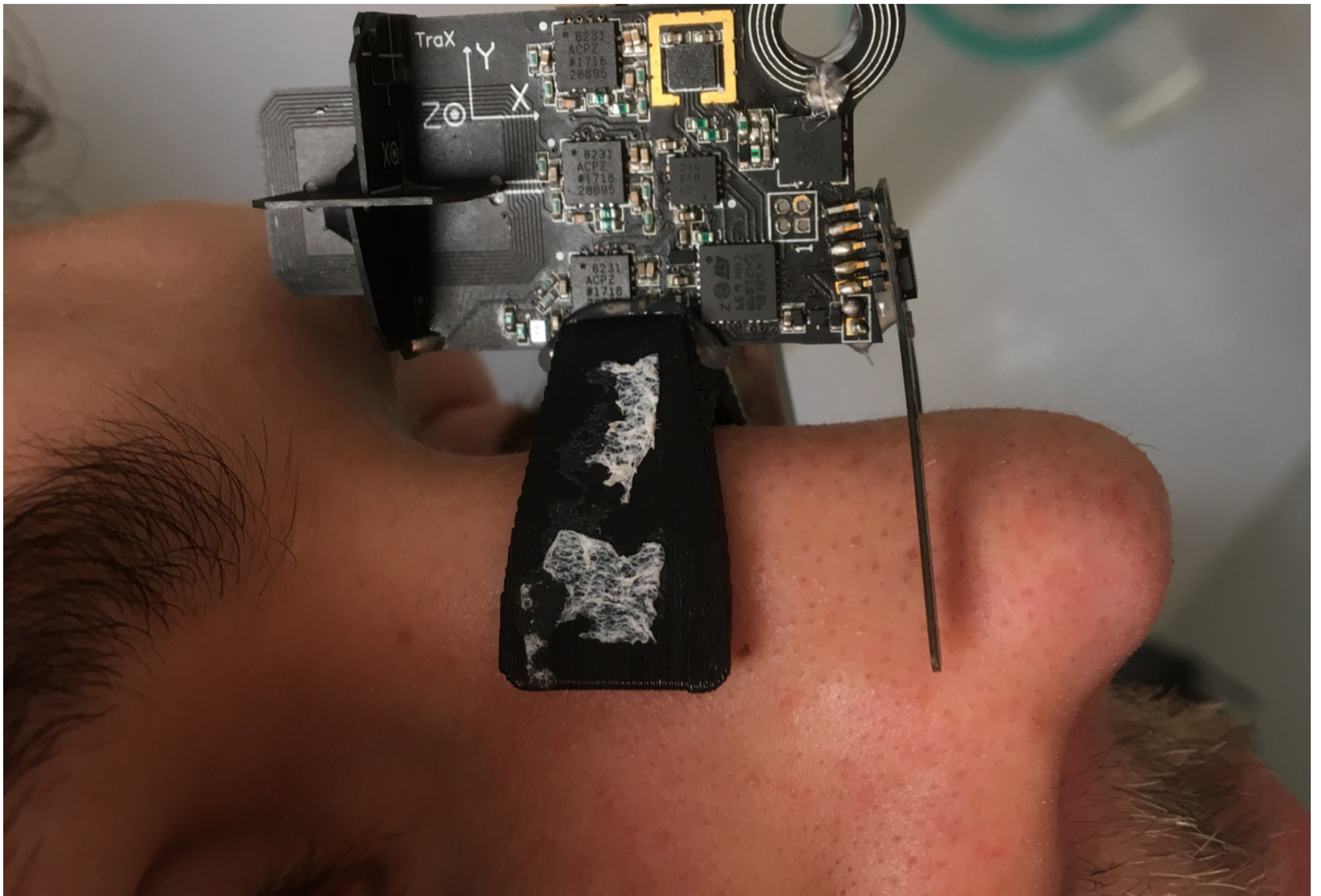


# Tracking Patient Orientation During MRI Scans

A simple and cost effective device capable of tracking the movement of a patient during long scans, improving image quality

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Header image provided by university

## Background

UCT researchers have developed a device that tracks accidental / inadvertent motion during magnetic resonance imaging (MRI) scans.

An MRI scanner applies magnetic fields to a body to generate an image of internal structures and the quality of the images are impacted by the slightest of movements due to the scanner sensitivity.

For this reason it is very difficult to image children, or elderly patients suffering from diseases that result in involuntary motion.

## Technology Overview

The inventor observed that the earth's gravitational field and the main magnetic field of the scanner are perfectly orthogonal, which led to the creation of a simple and cost effective device capable of tracking the movement of a patient during scans by determining the orientation of the device. These measurements are used to correct for scanning error introduced by movement, resulting in improved image quality and the general accuracy of scans.

The orientation tracking device includes:

- memory for storing reference data relating to the direction of the static magnetic field of an MRI scanner in a reference co-ordinate frame and the direction of the gravitational field of the earth in the reference coordinate frame,
- a three axis accelerometer for measuring an acceleration vector in the device's co-ordinate frame,
- a three axis magnetometer for measuring a magnetic field vector in the device's co-ordinate frame,
- a communication module and a processor for determining the orientation of the device.

## Benefits

- Allows for higher throughput of patients through the scanner.
- The Image quality of the scans is improved significantly.
- This device communicates wirelessly with the MRI scanning software and corrects for motion during the scan.
- No scanner-specific calibration is required unless very high accuracy scans are necessary, in which case a once-off calibration can be performed.
- The device is small and light and is positioned on a single point of the patient's body; which adds to the patient's experience during scans.

# Applications

MRI manufacturers/users can easily position the device on a patient, perform the MRI scan and correct for any patient movement thereafter.

MRI images are therefore more accurate and clearer; and allows for higher throughput of patients through scanners.

## State of Development

Technology Readiness Level 4 - The UCT team have working prototypes that demonstrate proof of concept.

## Opportunity

UCT is seeking a partner that can assist its inventor with the validation of the prototype and further product development towards commercialization.

The opportunity is to work with thought-leading researchers and inventors who have proven hardware and software development.

## Patents

- Britain (priority founding): 1513558.5. The device was filled for a U.K provisional patent which resulted in a patent report showing that the device is novel and inventive. The device has entered into national phase filing and has been filed in the United States of America, European Union, China, South Africa and Japan.

## IP Status

- Patent application submitted

## Seeking

- Development partner
- Commercial partner
- Licensing