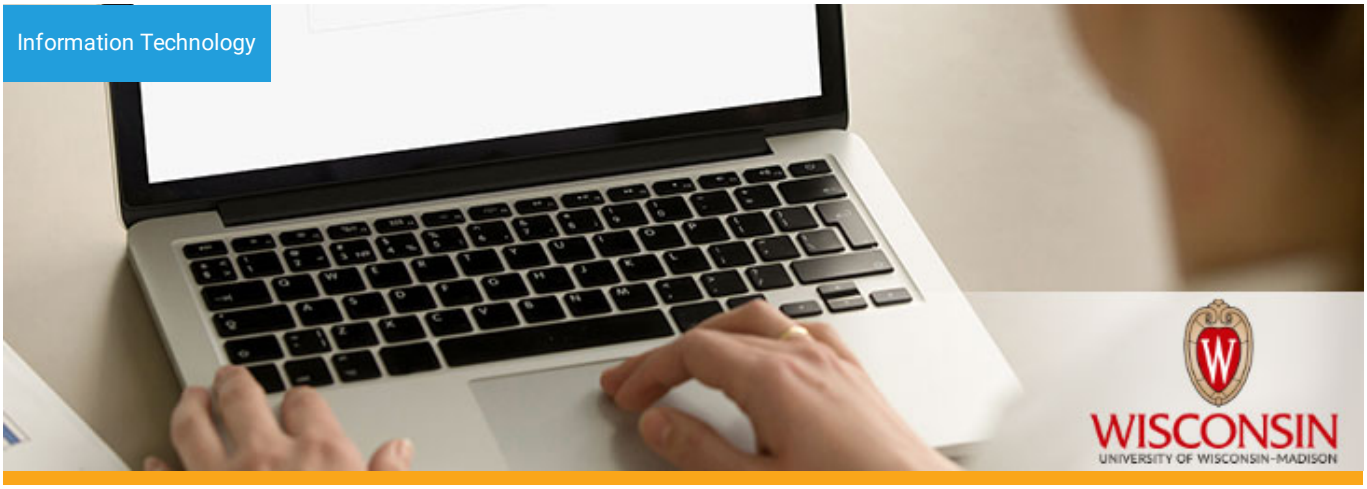
Information Technology



Imaging Technique for Recognizing Hand Gestures & Other Micromotions in 3-D

View U.S. Patent No. 10,152,798 in PDF format.

WARF: P170202US01

Inventors: Mohit Gupta, Brandon Smith, Pratham Desai, Vishal Agarwal

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested developing a cost-competitive speckle imaging technique for measuring non-rigid micromotions on smartphones and other devices.

Overview

With recent advancements in digital imaging, image sensors have become popular for capturing motion in 3-D. However, measuring small scale motion such as fine hand gestures across a user interface remains challenging. Conventional low-cost cameras can detect motions only down to the millimeter or centimeter scale.

Speckle imaging is a technique currently used to measure microscale motions in a variety of settings, including industrial inspection, scientific imaging and user interfaces (e.g., optical mice). To date, speckle imaging has been limited to measuring 2-D motions of single rigid objects and not suitable for tracking motion toward or away from the sensor (i.e., axial motion).

The Invention

UW–Madison researchers have developed a new imaging technique that analyzes speckle patterns to track extremely small 3-D motions on the order of 10-100 microns. This technique enables, for the first time, precise 3-D measurement of multiple moving objects using low-cost, off-the-shelf components.

Applications

- Gesture recognition for devices such as smartphones and wearable sensors
- Motion analysis of cells, molecules and other microscopic particles

Key Benefits

- Measures 3-D micromotions of more than one object
- Motion sensitivity is one to two orders of magnitude better than conventional sensors.
- Uses inexpensive components that can be scaled down

Stage of Development

Feasibility has been demonstrated with a hardware prototype consisting of a lens-less sensor and a laser pointer. The researchers have developed a high speed and accurate finger gesture recognition system that can be incorporated into various interactive wearable devices.

Additional Information

For More Information About the Inventors

- Mohit Gupta

Tech Fields

- Information Technology : Image processing

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867