QUANTUM FOR TRANSPORT

Ole Kock
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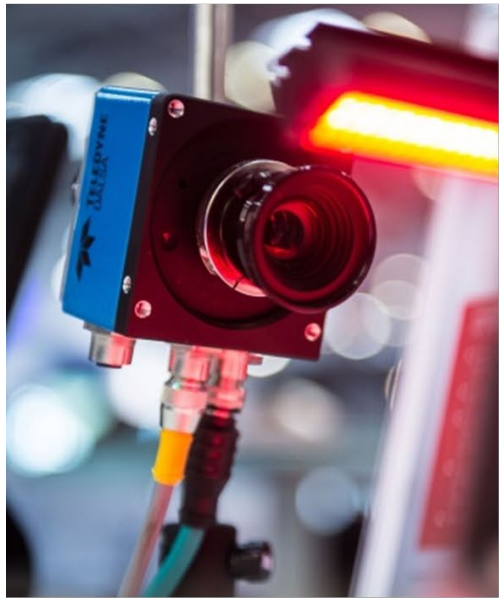
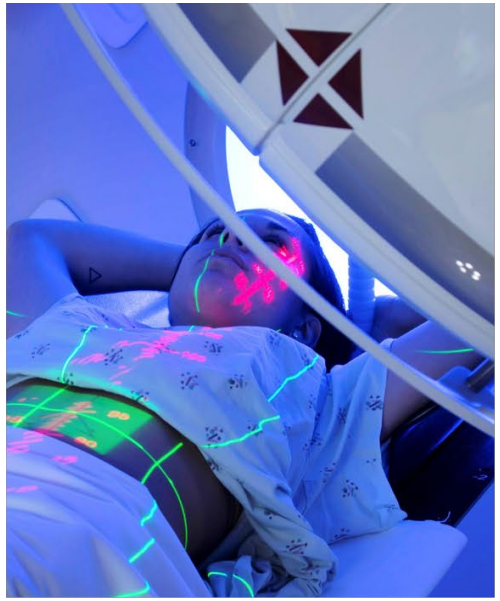
Product Development Manager - Quantum

Teledyne e2v - part of Teledyne Imaging

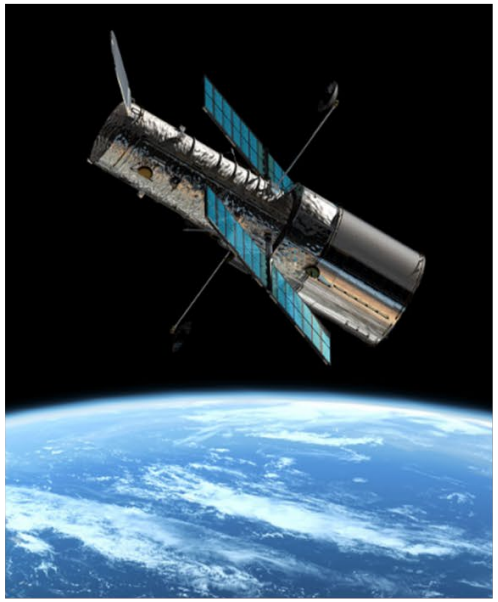
Part of the $3bn p.a. Teledyne group



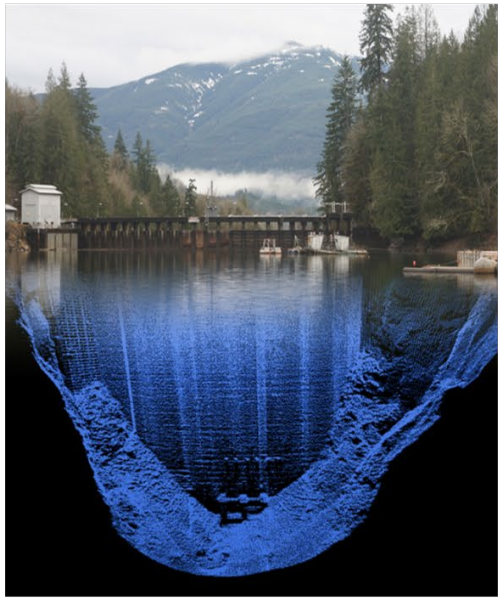
Machine Vision
DALSA | e2v | TS&I | ICM
Image sensors, cameras, processing hardware and software
Infrared, Visible, UV, X-Ray



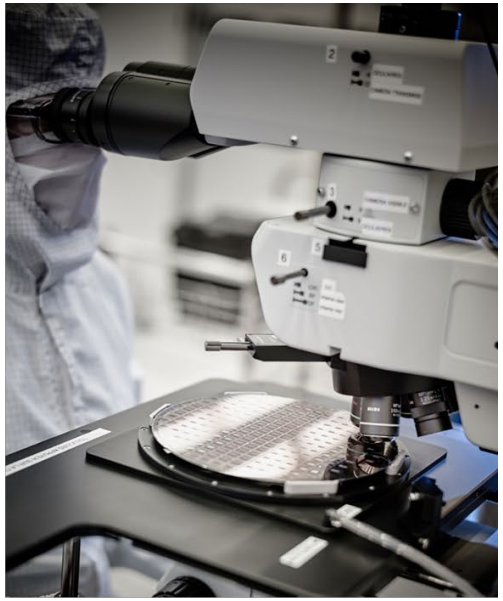
Medical and Life Sciences
DALSA | e2v
Radiography detectors, Radiotherapy generators



Aerospace & Defense
e2v | TS&I | DALSA
Sensors and systems for astronomy, earth science, and defense
High reliability chipsets & subsystems



Geospatial
Optech | CARIS
Lidar & Sonar 3D Surveying, Geographic Information Systems
Software



Semiconductors
DALSA | e2v
MEMS foundry
CCD foundries
Packaging services

A remarkable portfolio of specialist components & systems in sensing, signal generation and processing

Commercialising Quantum Technologies of the Future

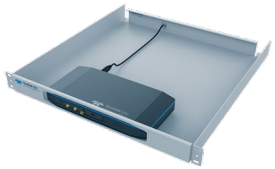
Shaping the future by designing the next generation of quantum technology solutions. Developing products and services that utilise the quantum properties of atoms.

Sensing

Gravity gradient sensors for seeing underground

Timing

Timing and Frequency solutions including GNSS holdover

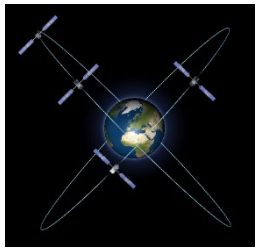


Space

Systems for Earth science, timing and navigation

Communications

Quantum Key Distribution for ultra secure comms networks



INNOVATION - Quantum Strategy

Advancing Product development thorough Academic & Industrial Partnership

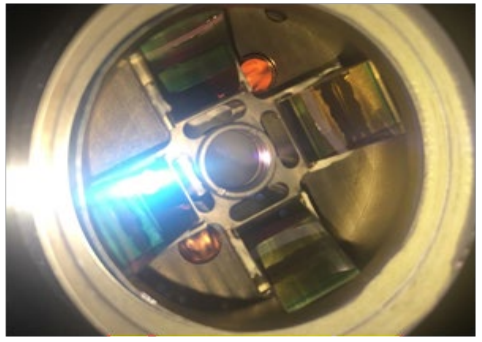
Investing in a new technology platform

Open Innovation

Technology developments in Academia, National Labs & Industrial partners

Key focus of the activities is to demonstrate feasibility

Evolving ideas into prototypes



Product realisation

Apply company strengths in vacuum systems, and high performance electronics to quantum technologies

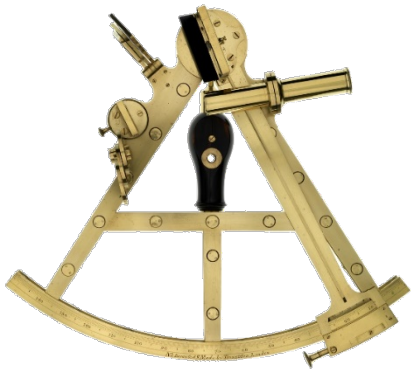
Evolving prototypes into manufactured products for profitable sales

Why use atomic clocks – Navigation & Holdover

Sextant vs Global Navigation System

Positioning accuracy:

500m



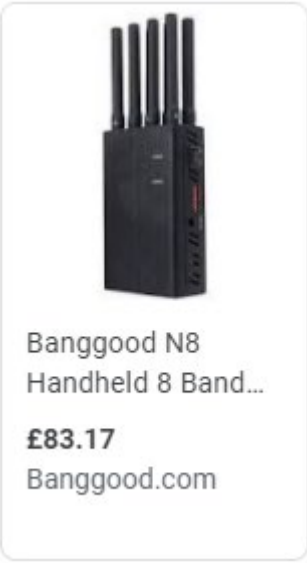
~1-10m

GNSS failure

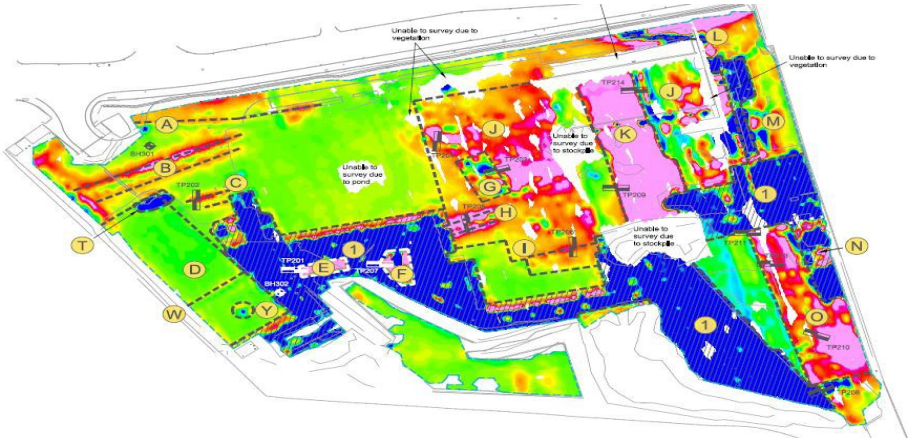
What happens when GPS / Galileo fails, is jammed or spoofed?

→ Atomic clocks act as local flywheel

→ Detection of spoofing



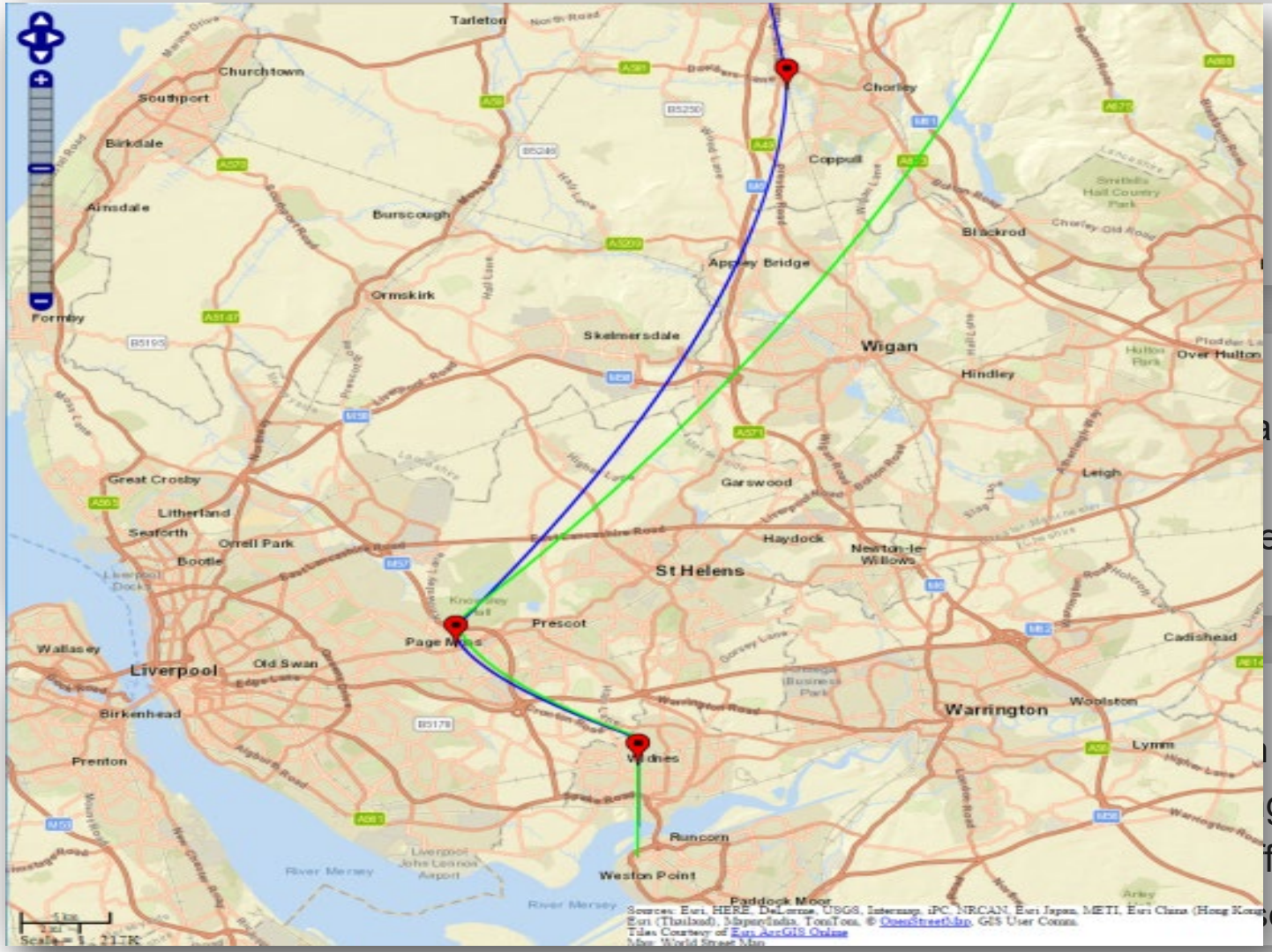
Quantum Gravity Gradient Sensors



RSK optocap ALTRAN TELEDYNE e2v Everywhereyoulook UNIVERSITY OF BIRMINGHAM
UNIVERSITY OF Southampton SMG Geomatrix EARTH SCIENCE LTD QinetiQ
Fraunhofer Magnetic Shields Electromagnetic Engineering UNIKLASERS covesion

Gravity Map Matching

Navigation Concept and Study Focus



adient database

educe drift

a number of use cases
g methods
ferent use cases
or