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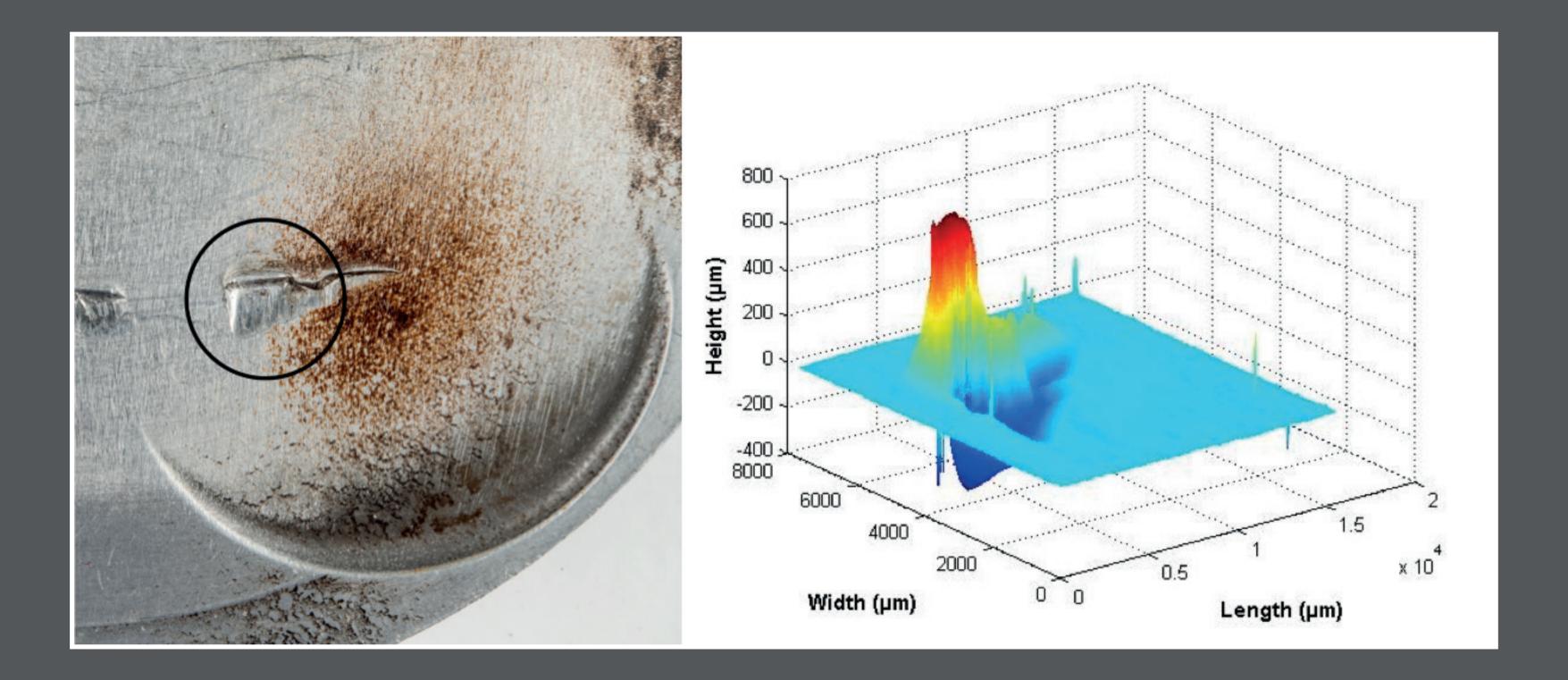
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Robust Intelligent Metrology

Wolfson School of Mechanical & Manufacturing Engineering – Loughborough University

Robust Intelligent Metrology considers how to maintain, develop, streamline and apply core metrological principles within rapidly evolving measurement scenarios and environments. The aim is to deliver metrology laboratory quality measurements and data confidence, but with equipment integrated into operating High Value Manufacturing cells. Key challenges are to understand; transducer / surface interactions, data processing and integrity, in-cell calibration / traceability. The end result is to provide engineers with quicker, better data.



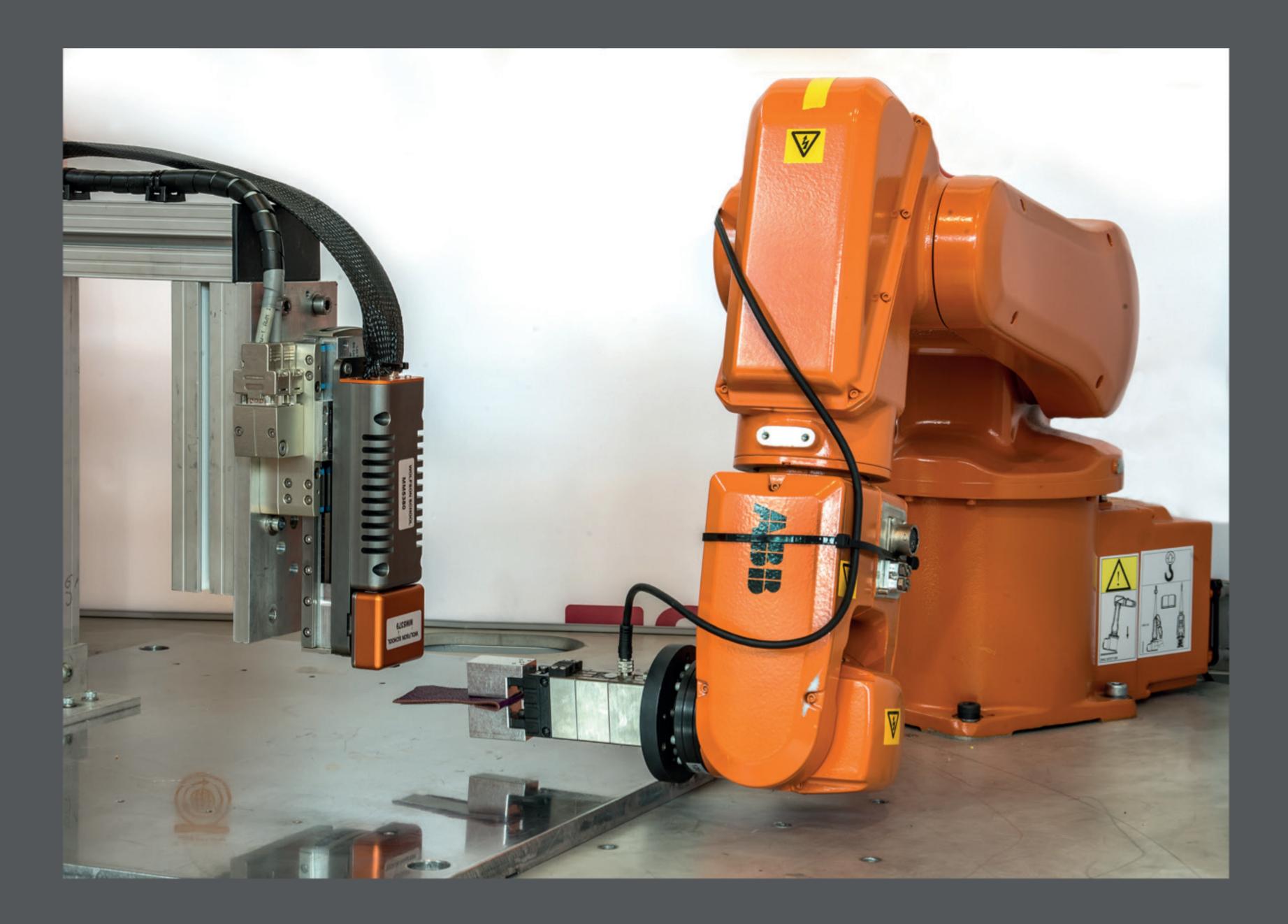
Current Projects:

- Surface defect analysis
- Optical micro-CMMs
- Near UV line scan systems
- Non-linear optical analysis
- Surface scattering modelling
- Calibration standards
- Multiplexed transducers
- Robotic interfacing
- Traceable Artefacts / Soft Gauges



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HVM measurement challenges:

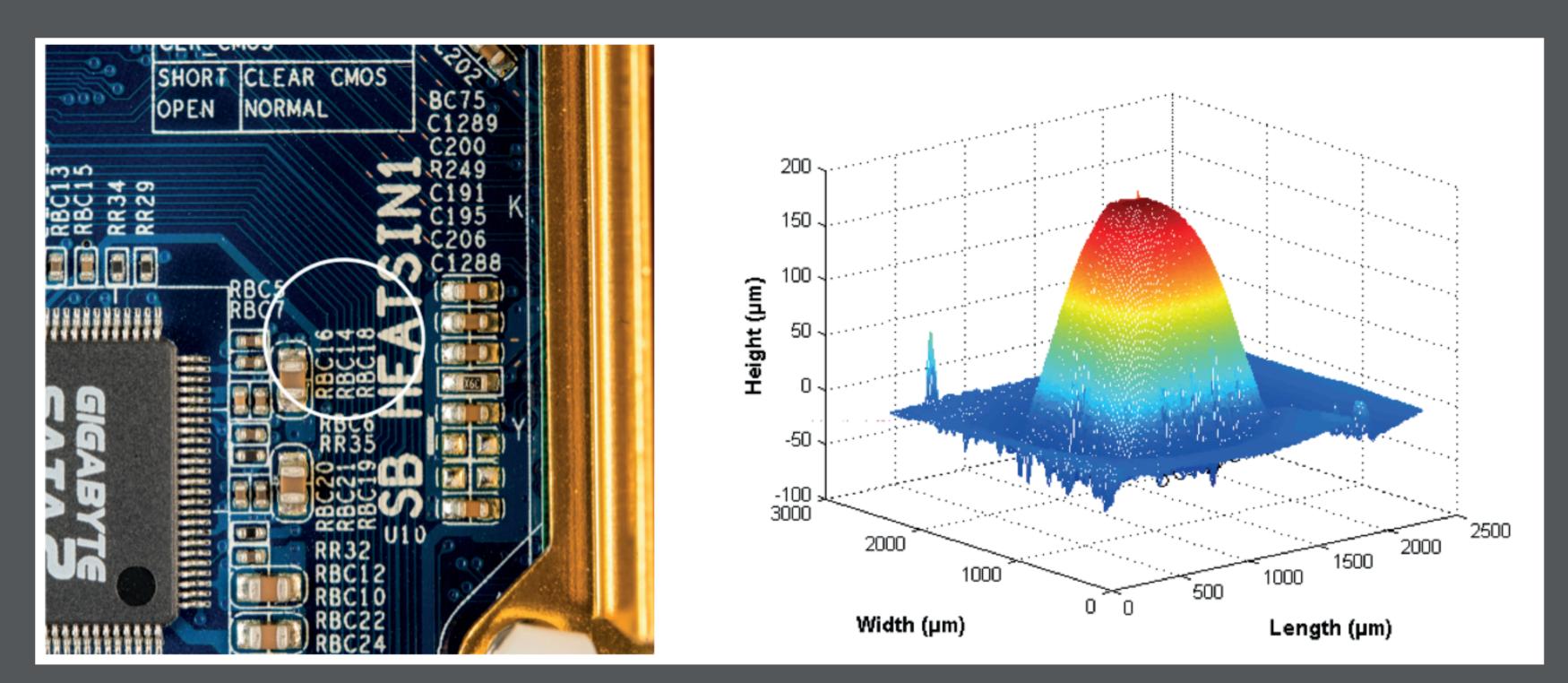
- In-line / On-line
- Robotically interfaced
- Large area
- High resolution
- Real-time data processing
- Multiple DOFs
- One sensor measures all
- Calibration / Traceability
- Health-checking
- Artefacts / Soft Gauges
- Uncertainties / Errors

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- Focus Variation
- Coherence Scanning
 Interferometry
- Optical low-Coherence
 -Tomography
- Fringe projection
- Confocal Microscopy
- Triangulation gauges
- Scanning contact systems



Project demonstrators: Aerospace surfaces, Automotive components, Bio-organic materials, PCB solder bumps.



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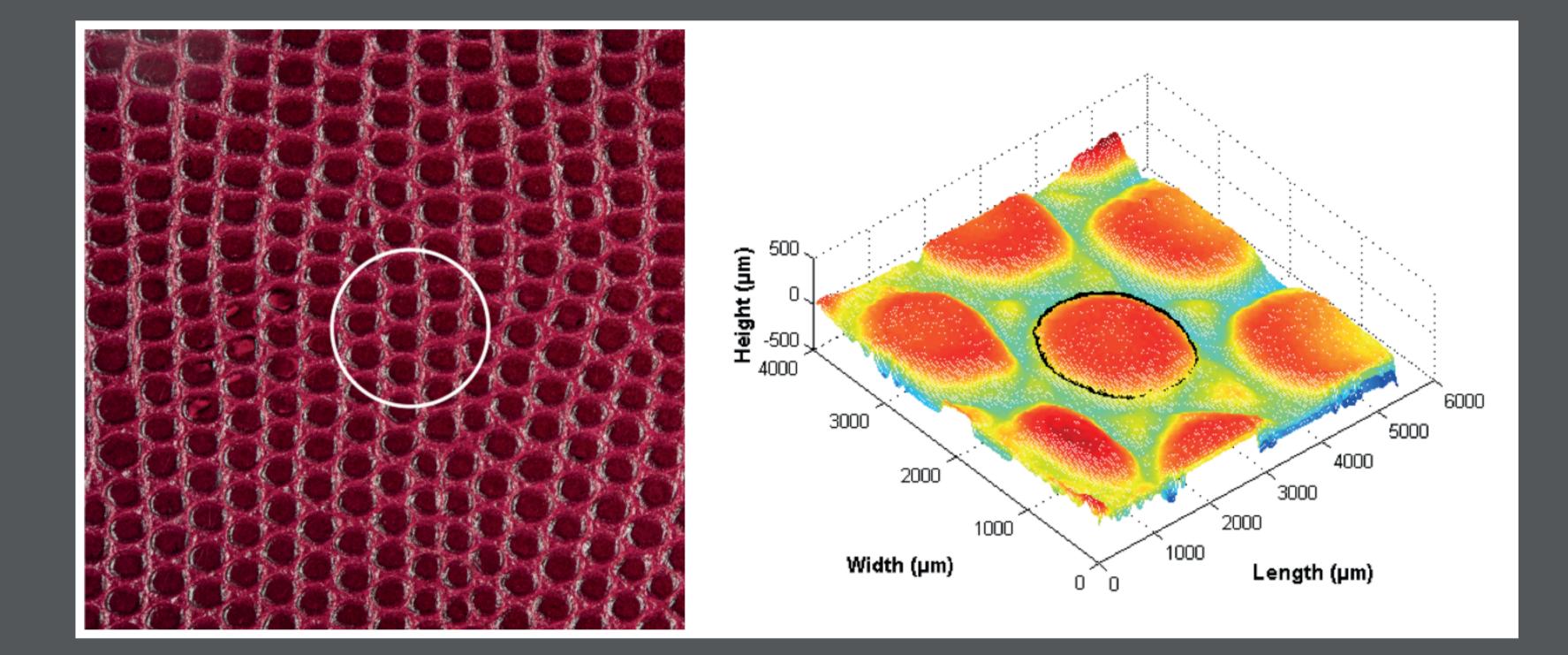
Automated Surface Defect Measurement

- Wolfson School of Mechanical & Manufacturing Engineering Loughborough University

Robust Intelligent Metrology is demonstrated in the context of Automated Surface Defect Measurement on a wide range of different surfaces. The emphasis has been to develop calibrated and traceable 3D data processing environments, which allow the measurement of varying scales of surface defects/features (micrometres to millimetres) on significantly different substrates, using a wide range of different commercial transducers for source data.

Automated 3D data processing:

- Matlab
- C++
- MVTec Halcon
- Robust Gaussian based filtering
- Defect calibration standards
- Traceable 3D Softgauges



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