



QUANTIC

The UK Quantum Technology Hub
in Quantum Enhanced Imaging

Automated Video Surveillance



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Video surveillance is becoming an indispensable tool to ensure both personal and public safety. Common applications include monitoring of critical infrastructure, highways, financial institutions, airports and public transport as well as private property.

QuantIC's researchers are working with security company Aralia Systems Ltd to investigate the feasibility of employing an LED visible light system for covert automated video surveillance. Recent advances in visible light sources and sensors present the potential for extremely small modules for cheap and covert imaging of many parallel video images within a single system.

The company has developed a covert infra-red imaging system based around a photometric stereo concept. The photometric stereo imaging allows reconstruction of the topology of the scene and greatly improves the automated image analysis task. The use of visible LED sources will offer significant cost benefits to the system, increase covertness and provide the opportunity

for further system functionality including LiFi communications and position sensing.

A prototype system is being built and evaluated using high speed LED light sources developed under the QuantIC programme. The project is aimed at defining future design requirements at both a source and system level.

Aralia systems Ltd, a UK SME, has been providing a unique set of intelligent surveillance products such as full scene Video Content Analysis, since 1997, to a wide customer-base (airports, rail transit systems, city councils, retail outlets and oil and gas companies) with core business focused on security and surveillance in the UK and USA markets.

Application area	Automated video surveillance
Estimated Component Cost	As laboratory demonstrator ≈ £1K (Optical consumables. Not including micro-fabrication of devices and electronic integration). In volume ~£10 (CMOS chip + LED die).
Present Performance Specs	Resolution and frame rate: 16x16 @ 2k FPS, 10x40 @ 30k FPS Chip size: 3x3 mm Package dimensions: 2.5x2.5x2.5 cm (packaged chip + projection optics)
Latest Publications	Concept of a GaN-LED-based positioning system using structured illumination, J, Herrnsdorf, MJ Strain, E Gu and M D Dawson, IEEE Photonics Conference (2015)

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