

# Artificial Intelligence in Local Government

Deep Learning, Real-Time Object Detection & Case Prioritisation



EMERGING  
**TECHNOLOGY**

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# Who we are

“ Methods is one of the leading  
**modernisation**  
partners for the UK public sector ”



**Digital Transformation Leaders**

**750**  
Employees / associates



**Allow re-use wherever possible**

**7**  
Offices



**Approach enables rapid progress**

**30**  
Years' experience



**Services Across Lifecycle**

**320+**  
clients



**Proven resourcing delivery model**

**110+**  
live projects

# Methods group of services

## Business Technology

- Large Scale Contract Disaggregation
- Exit & Transition
- Service Management, Siam Services
- ServiceNow Design Implementation & Support
- Business Change Management
- Transformation Delivery
- Project Management Services

## CoreAzure

- Cloud Design & Architecture
- Azure (Microsoft Gold Partner)
- Office 365, Sharepoint
- Complex Cloud delivery & migration

## Digital

- Discovery, Alpha
- Wardley Mapping
- Service Redesign
- User Research
- Digital Strategy
- TOM & reference architectures

## Emerging Technology

- AI / machine learning
- RPA
- Blockchain / DLT
- IoT, locational technologies

## Professional Services

- List X (SC, DV)
- 600 Associates
- Flexibility
- 13 CCS Frameworks

## Development

- Software Engineering
- Cloud Engineering
- Cyber Security
- Identity management and Trust
- Data migration & ML
- AWS & Azure
- Open technology

## Analytics

- Data Science
- Data Sharing
- Big Data
- BI / MI
- Data/Information Strategy

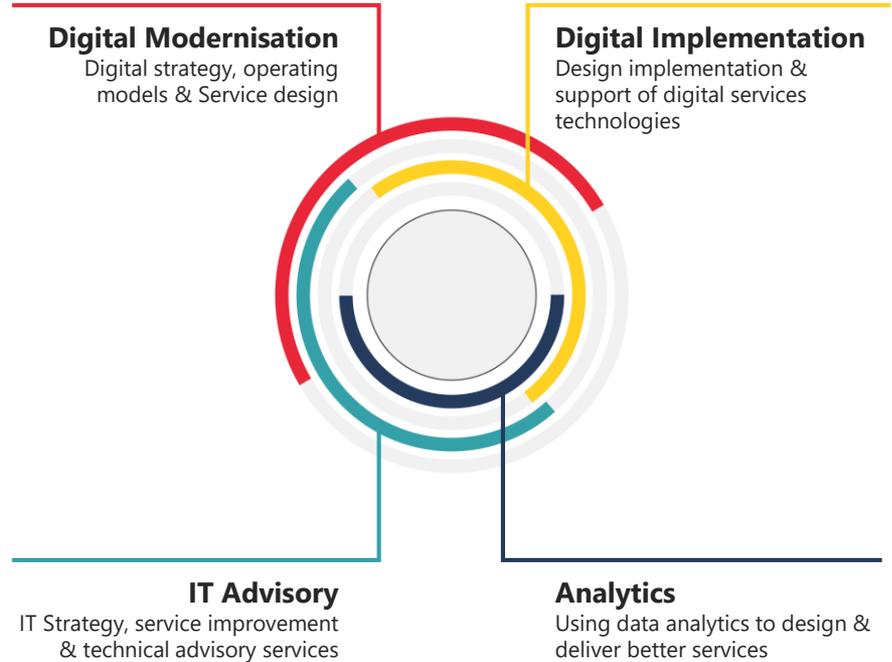


## OUR MISSION

We are here to enable local government to deliver better services

We're passionate about local public services, many of our people are drawn from local government and public-sector backgrounds.

We understand technology and how it can enable local government transformation.



## Artificial Intelligence in Local Government

# User-Driven Intelligent Public Services

Our mission at Methods is to redesign public services centered around citizens and user needs. When we combine that with Artificial Intelligence (AI) systems, we can fundamentally transform and revolutionize public services from today's reliance on reactive engagement with the public to proactive, low-friction, channel-agnostic and consent-based offerings. And we at Methods are at the forefront of that journey - working with a variety of local government bodies and organisations across the UK to make that vision a reality.

### Artificial Intelligence Use Cases in Local Government

Artificial intelligence-driven systems are radically changing the world around us. What was once the domain of mathematicians and scientists is now readily accessible and consumable through open source technology, cloud-based managed services and low-code platforms. In local government, the meaningful applications of AI benefitting the public are almost limitless, and include:

- Hyper-personalized services
- Proactive citizen engagement through channel-agnostic chatbots and knowledge discovery
- Pothole, graffiti and fly-tipping prediction, detection and intelligent case prioritisation
- Predictive maintenance of assets and allocation of resources
- Staff schedule and resource optimization
- Reducing carbon footprints and optimizing energy usage
- Combatting child abuse and financial fraud



Methods are working with the Emerging Technology team at **Swindon Borough Council** on a wide range of innovative and exciting PoCs utilizing artificial intelligence and other emerging technologies.....

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## Use Case – Report It

Deep Learning Real-Time Object Detection

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# Artificial Intelligence in Local Government

## Deep Learning Real-Time Object Detection

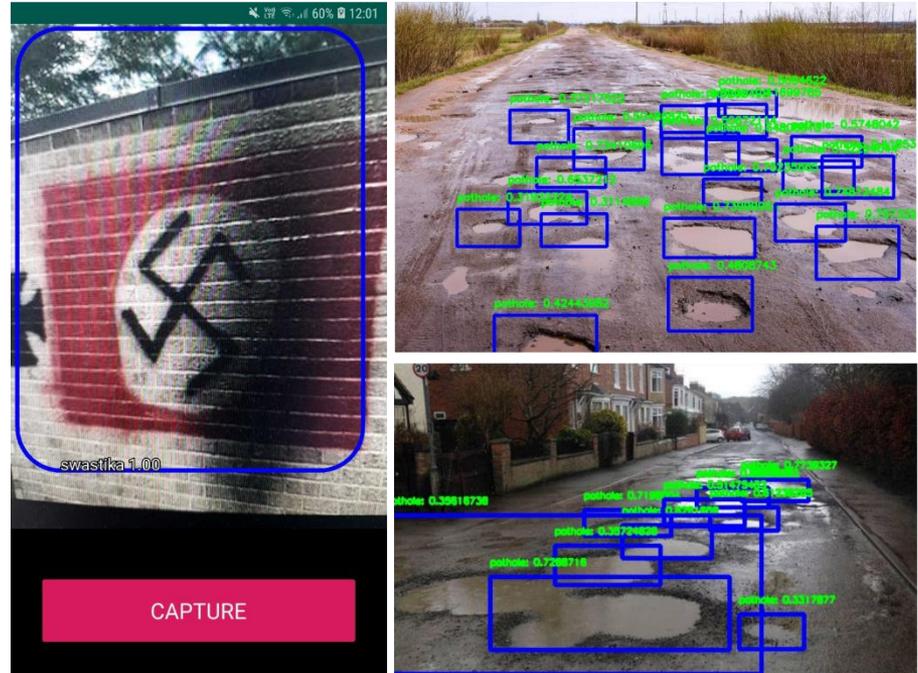
**What** – Report It common service pattern.

**How** – Real-time object detection using deep convolutional neural networks embedded into devices supported by fast, high-throughput and low-latency neural architectures.

**Why** – Additional actionable intelligence to aid in the automated classification and prioritization of reports of potholes, graffiti and fly-tipping, amongst other case types, by members of the public.

### Benefits

- Initial classification and filtering of images generated by members of the public and other channels.
- Fully or semi-automated prioritisation of cases including graffiti containing offensive or inappropriate content, gradient descent of potholes and fly-tipping volume.
- Real-time case creation by embedding real-time object detectors into live video streams via existing cameras fixed to council repair and maintenance vehicles - for example the live identification and creation of pothole, graffiti and fly-tipping cases integrated with GPS and location services.



Pothole and offensive graffiti real-time detection

## Artificial Intelligence in Local Government

# Deep Learning Real-Time Object Detection – Live Video Streaming

Methods-trained neural networks embedded into live video streams and GPS/location services enabling proactive, real-time and event-driven case detection, creation and prioritisation, seamlessly integrated into backend council case management systems and workflows.



Original video feed

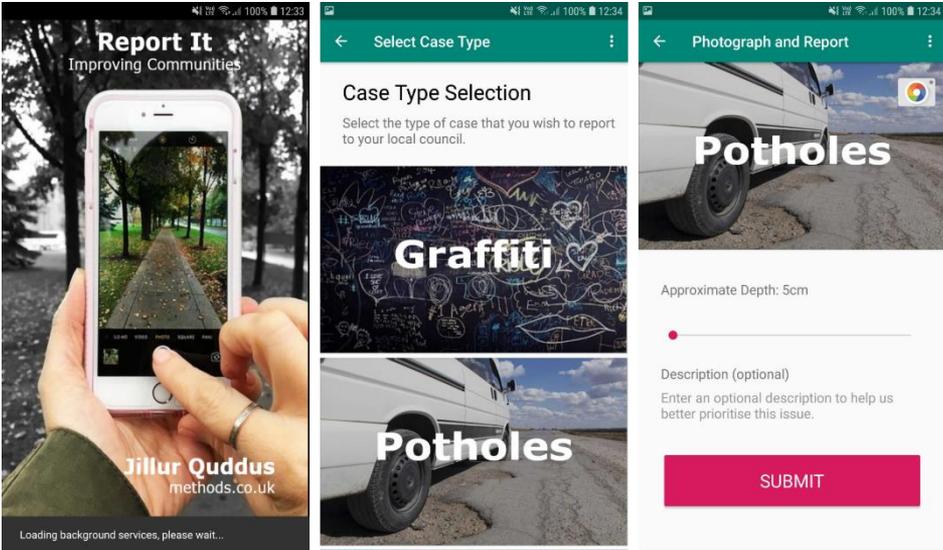


Real-time case detection integrated with GPS

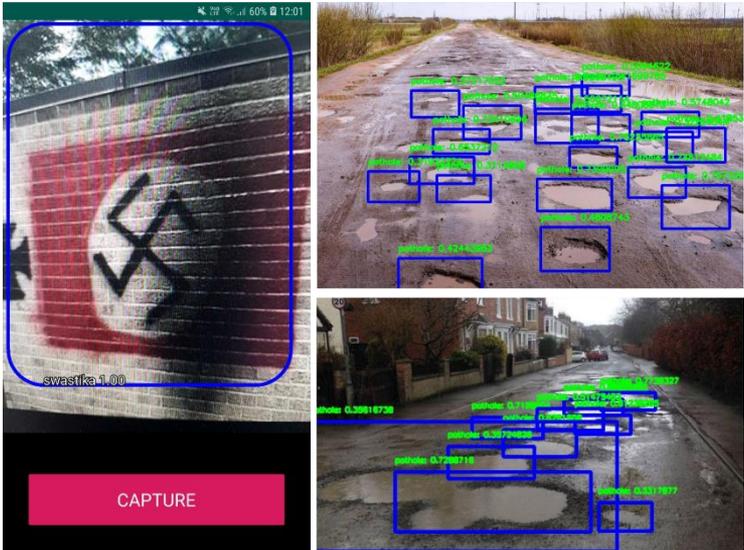
# Artificial Intelligence in Local Government

## Deep Learning Real-Time Object Detection – Android Mobile App

Methods-trained neural networks embedded into citizen-facing mobile apps for members of the public to report cases and receive proactive notifications on case progress, integrated with backend council case management systems and workflows.



Methods' Report It Mobile App



Citizen generated cases integrated with mobile location services

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# Use Case – Potholes

## Actionable Pothole Detection

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# Artificial Intelligence in Local Government

## Actionable Pothole Detection

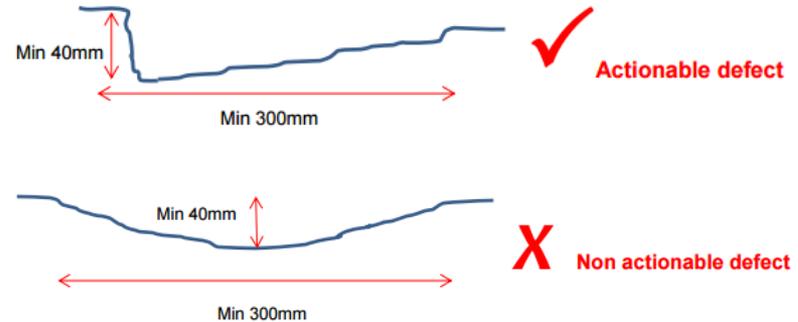
**What** – Actionable pothole detection.

**How** – Deep learning combined with advanced image processing and spatial techniques.

**Why** – Not all potholes are created equal! Due to budgetary and resource constraints, many local government bodies must prioritize potholes for repair, with depth and gradient descent being the two most important attributes considered.

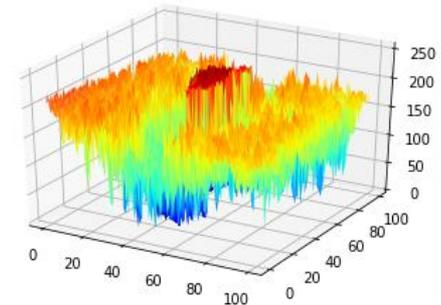
### Benefits

- a) Automatically detect and classify **actionable** potholes for prioritisation i.e. steep vertical edges > 40mm (latest applied research only covers the *identification* of potholes using deep learning from images and videos, not their physical attributes which is required for meaningful prioritisation).
- b) Reusability of capabilities – the same advanced image processing techniques may be applied to other case types including fly-tipping, and outside of the Report It common service pattern.



Source: Devon County Council

<https://www.devon.gov.uk/roadsandtransport/report-a-problem/report-a-pothole/>



Methods' Actionable Pothole Detection

# Thank you!

*A big thank you to everyone who attended and contributed to the session.*

For further information on this approach or anything else relating to Methods and the work we do please contact:



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Jillur is Lead Data Scientist in Methods Emerging Technology Practice. He has a background in computational mathematics and is a published artificial intelligence author with a professional background in JVM-based software engineering, machine learning, deep learning, applied graph theory and big data technical architecture.

He has over 12 years of hands-on experience in architecting and engineering distributed, scalable, resilient, high-performance and secure solutions used to combat serious organised crime, cyber-enabled crime, financial crime and fraud. Jillur has extensive experience of working within central government, intelligence, law enforcement and banking, and has worked across the world including in Japan, Singapore, Malaysia, Hong Kong, Australia and New Zealand.