Workshop 3C

Damp and Mould – Can AI and machine learning help us?

Speakers:

Martyn Stones, Oxford Brookes University

Lee Revell, Halton HA

Lewis Garley, Rand Associates

Chaired by: Simon Lowe

Room: C

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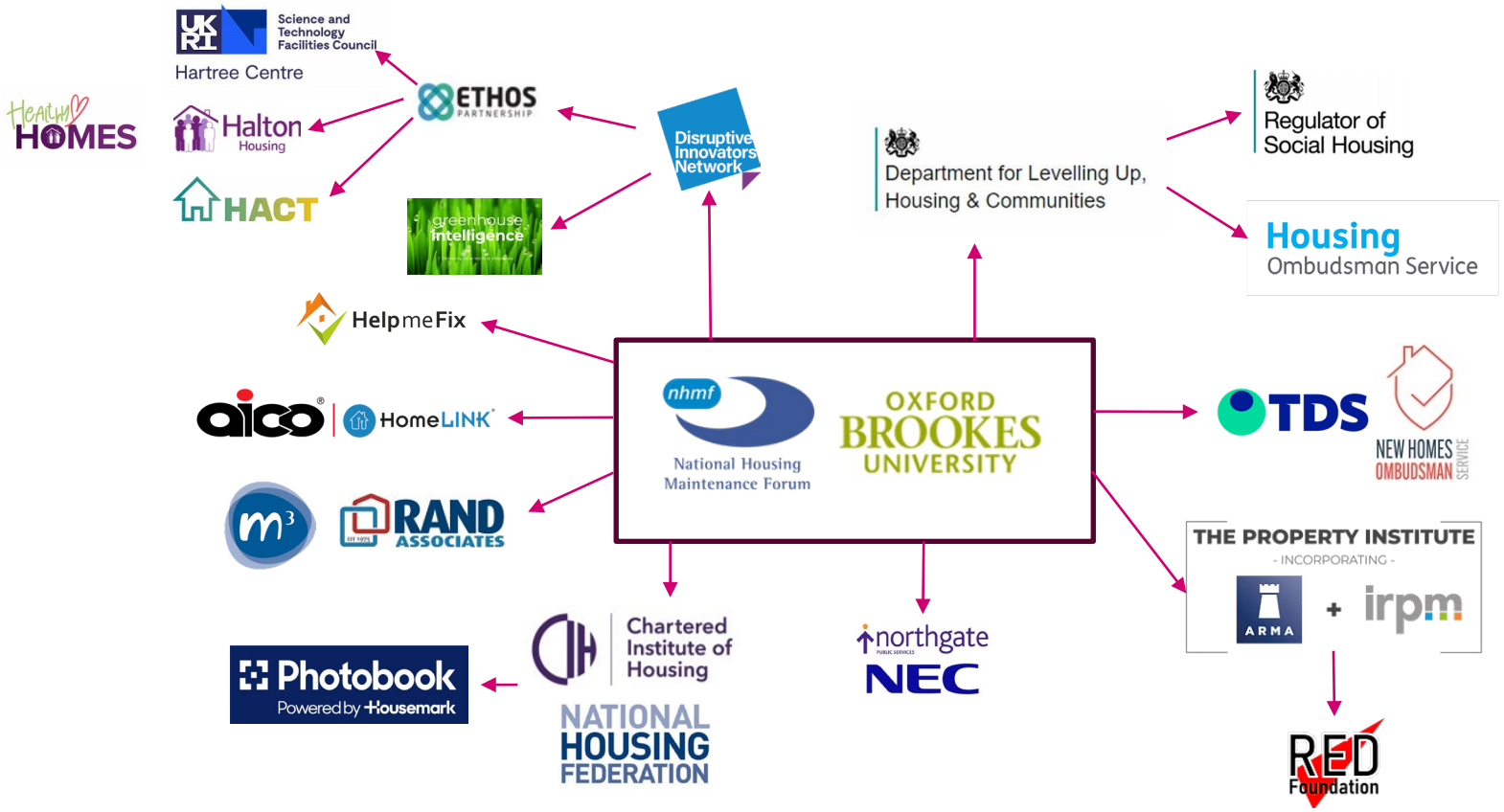
Agenda

- Discovery – finding the gaps
- Computer vision and defect detection
- Real world perspectives and potential:
  - A landlord’s view; and
  - A surveyor’s view
- Next Steps

Discovery – Finding The Gaps



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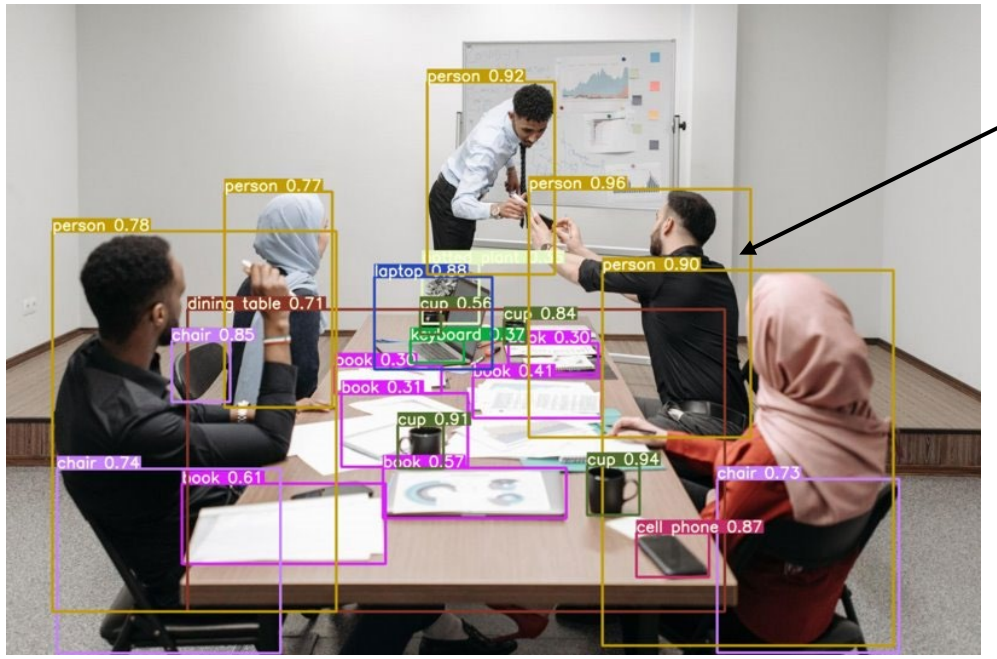
What is Computer Vision?

- Based on human vision with image recognition powered by machine learning.
- Recognises patterns and trends to support both diagnosis and prediction.
- Already in use in other settings e.g. medicine and your smartphone pictures.
- Fast and consistent but needs lots of data and training.
- Potential to reduce costs and improve resource allocation.



Label and confidence score

Google Photos

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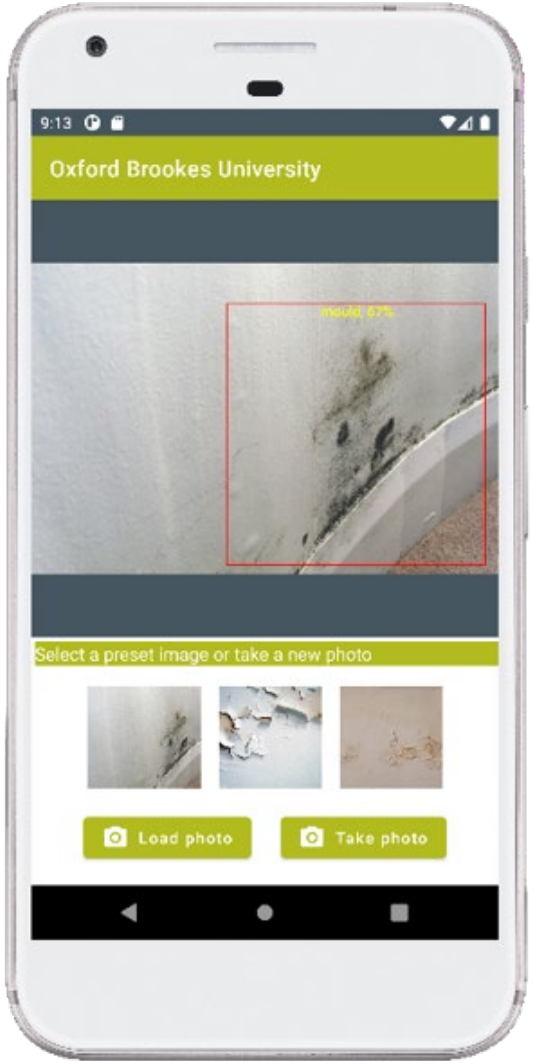
Defect Detection – Smartphone App

- Potential to link with LIDAR technology for measurements, thermal imaging smartphone functionality to show surface temperatures and the ability to train on types of mould to identify more dangerous strains
- Proof of concept pilot in discussion with one of NHMF's largest landlords.



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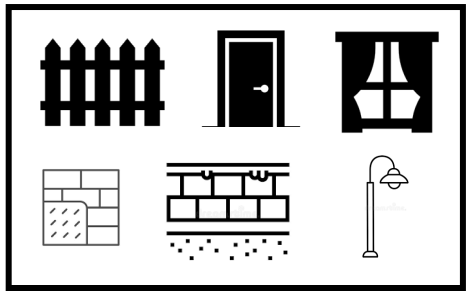
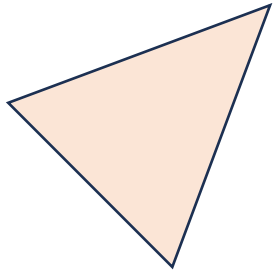
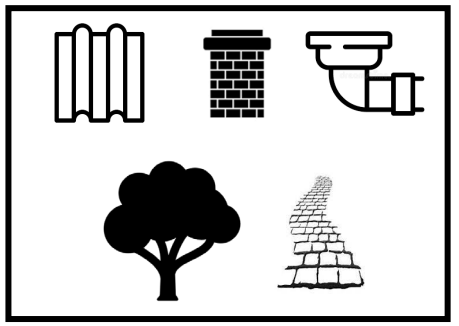
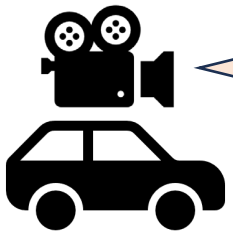
Perez, H., and Tah, J. H. M. (2021). "Deep learning Smartphone Application for Real-Time Detection of Defects in Buildings". Structural Control and Health Monitoring, Vol. 28:e2751, https://doi.org/10.1002/stc.2751.

Case Study: Digital External Survey









Case Study: External Model

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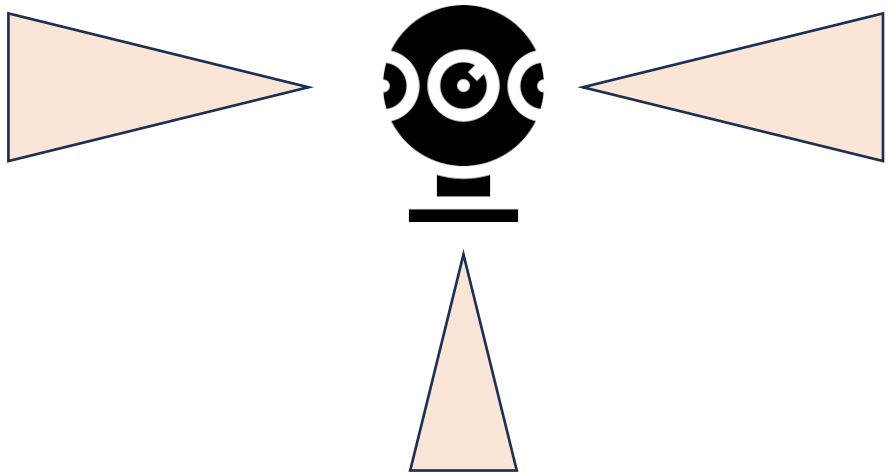
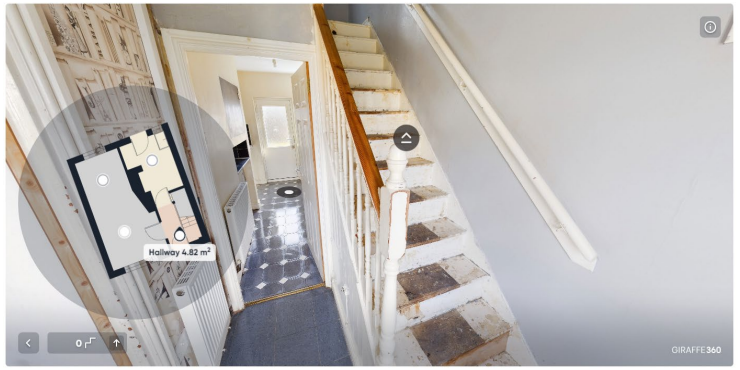
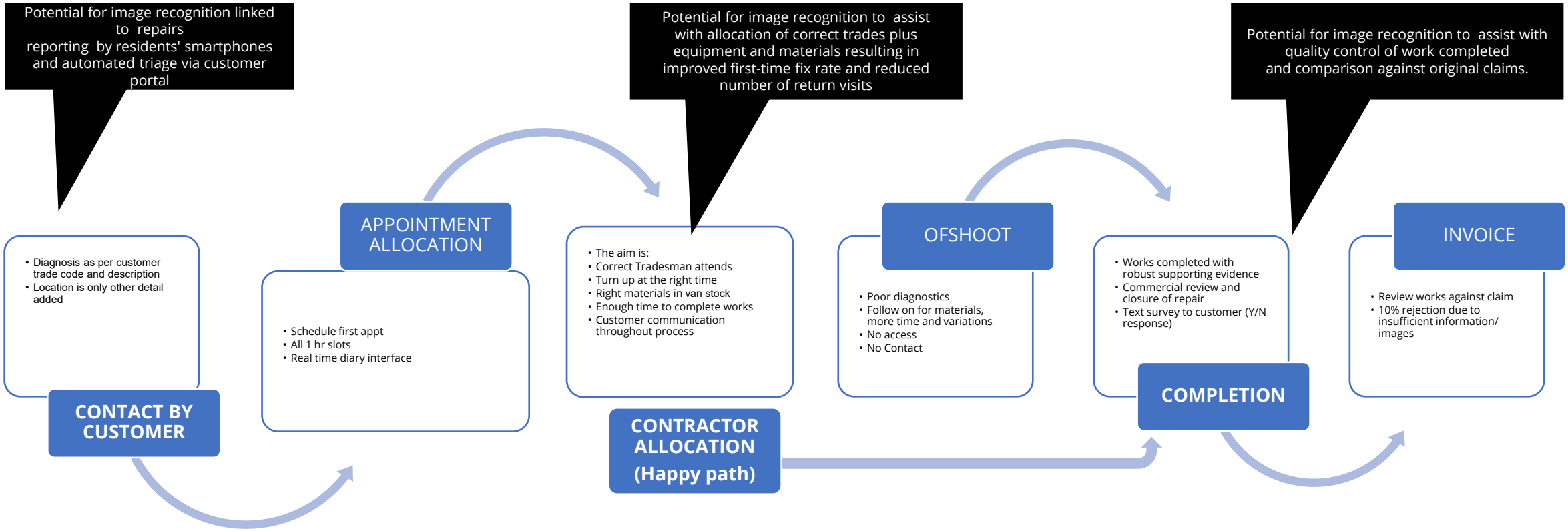
Case Study: Digital Internal Survey





Potential Use Cases - Repairs Process



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Creating a digital twin to support whole lifecycle management driving key business outcomes

Asset Performance Management
(Energy Sustainability, Asset Usage, Occupancy, Compliance)

Smart Asset Management
(EAM/CMM/CAFM + integrated procurement, supply chain management and BIM)

Data Analytics
(Big Data, AI, Insights, Predictive Maintenance, Event Management)

3D Model Scanning
(Geometry + Asset information into Unified BIM Model, Computer Vision capability)

BIM Integration
(Integration, visualisation & interaction with BIM Models)

Connecting Assets
(IoT or IIoT retrofit, BMS and SCADA integration, creating & supplying data for Insights)

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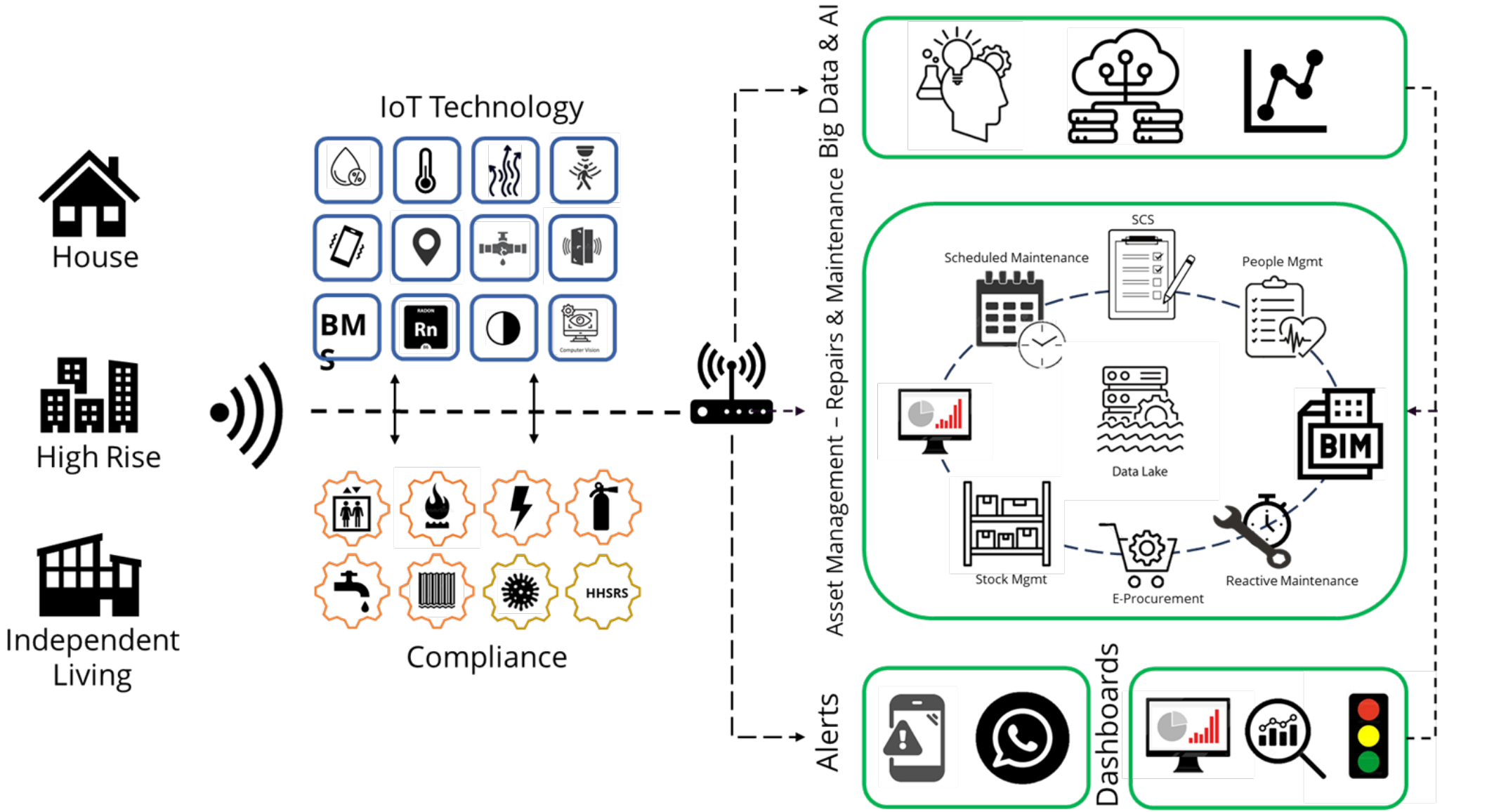

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Possible Use Cases For Surveyors

Agenda:

1. Current Surveying Deficiencies
2. Potential Benefits of AI
3. What's Required Next?

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Possible Use Cases For Surveyors

Current Surveying Deficiencies:

- Subjective
- Identification/ Severity Ratings
- Human Error
- Reporting Processes

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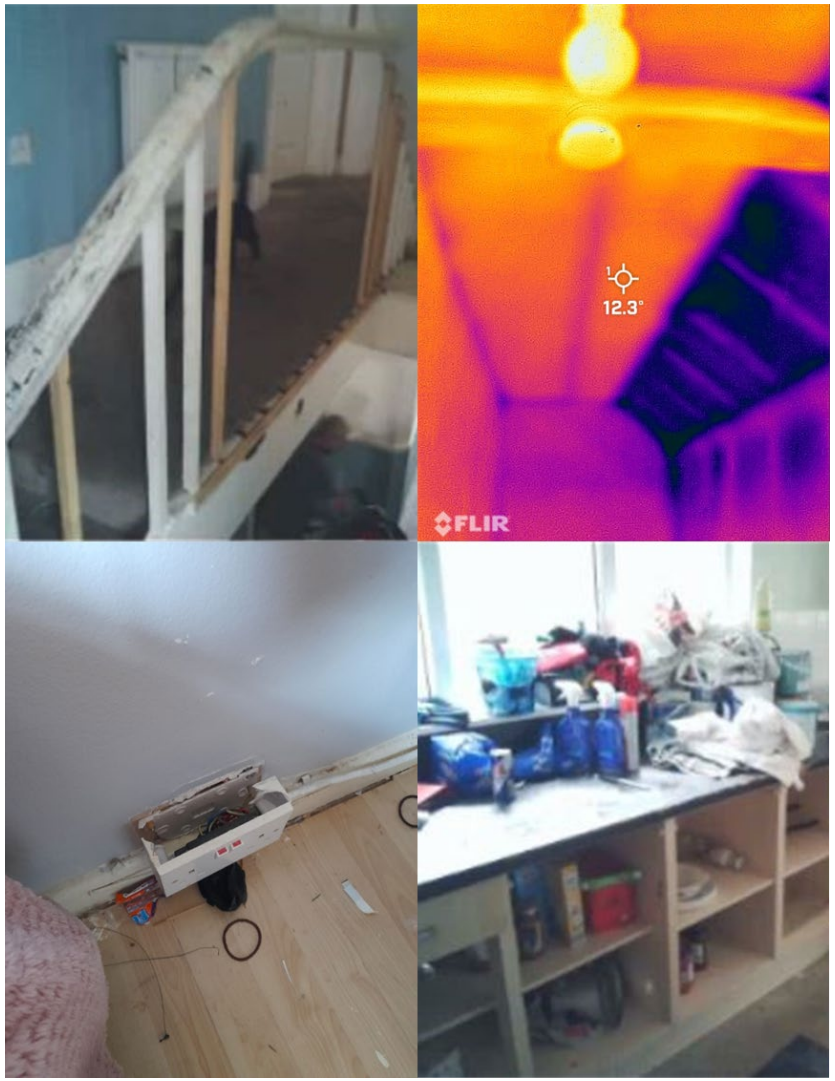
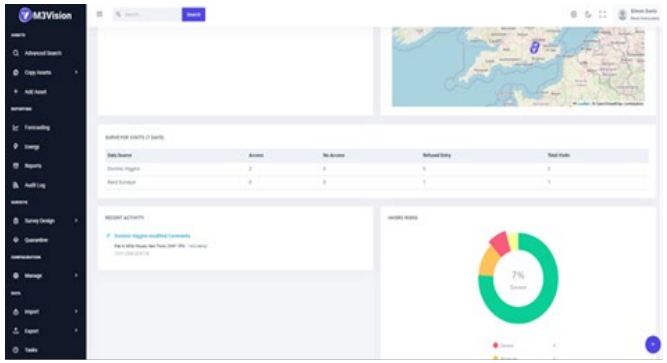
Possible Use Cases For Surveyors

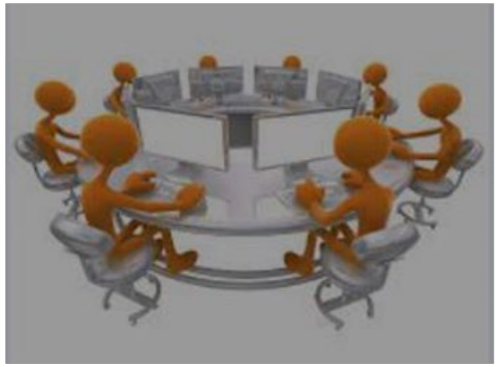


Potential Benefits of AI:

- Integration into data collection, asset management software systems and additional plug-in technology.
- Aid surveyors in identification/ severity ratings.
- Use for all HHSRS and repair issues, with potential to even link to DHS elements?
- Minimise human error, improve reporting processes and actioning of repairs (Awaab's Law!)
- Potential to link to SoR with estimate costs for remedial works.
- Potential to develop and integrate into resident repair reporting apps.

Possible Use Cases For Surveyors





What's Required Next?

- Provision of Data (Photo Evidence)
- Technical Collaboration Workgroups (AI Teaching)
- Product Integration/ Testing on Live Data Collection Apps
- Feasibility Study into Ease of Implementation of AI into Existing Asset Management & Resident Repair Reporting Systems.
- Education (User/ Resident Information)
- Damp & Mould Risk Register?

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Next Steps...

- Complete our pilot and prove the concept.
- Do one and serve many. Please make contact if you are interested.
- Any questions?

- Martyn Stones
- Mobile: 07774 290839
- Email: mstones@brookes.ac.uk

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Thank you.

See you at the
next conference!

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