Associate Presentations (am)

- Femi Adeyemi-Ejeye, Kingston University
- Josep (Pep) Canyelles-Pericas, Northumbria University
- Shuai Wang, University of Manchester
- Michael Taylor, Queen’s University Belfast
Next up:
Femi Adeyemi-Ejeye,
Kingston University
Towards a Smart Hybrid Door Phone System

Dr Femi Adeyemi-Ejeye
Overview

- Current Door Phone Systems
  - Analogue/Legacy
  - IP-based
- Opportunities
- Project Goal
- Initial Outcome: Prototype
**CONS**
- A phone per flat/office
- Can only answer and control the door using the provided phone
- No log of visitors
- Can’t ask the postman to leave your parcel somewhere when not at home

**PROS**
- Can see who is at the door and Open
  - Even if you live on the 15th floor
- Uses Old Telephony Technologies
- Can deliver Audio and Video
- Open the Door

Legacy Door Phone Systems
**PROS**
- Can call multiple phones per flat
  - Even mobile phones/landlines
- Uses internet based technologies
  - Voice and Video over IP
- Call Logs
- Open the Door

**CONS**
- System Replacement costs
  - Need builders, surveyors, engineers
- Unreliable if the Internal Network is down
• UK Market is Estimated at £150M
  • 40% located in Greater London (£60M)
  • Part of the £2 billion p.a UK electronic security market

• From 1992 – 2016
  • 3,510,220 residential dwellings were built in England
  • 30% of them are Flats

• 2N released the First IP Door phone released in 2008

• Entryphone currently 10,000 sites

Source: Department for Communities and Local Government
**Project Goal**

**Hybrid Infrastructure**

**PRODUCT BENEFITS**
- Can have IP Door phone features
  - Callings multiple phones
  - Use of Internet
- No need to replace entire system
- If the Internet goes down the Apartment Phone still works

**KTP BENEFITS**
- New product line for Entryphone
  - Cost effective product
- Enhance Kingston IoT research profile
  - Publications and Collaborations
- Associate’s exposure to Product development cycle
Entryphone’s Current System

Hybrid Components

- IoT Gateway
- A-2-D Audio/Video
- GPIO pins
- DTMF translator

Analogue Door and Apartment Phone
Thank you for listening

Questions/Comments
Next up:
Shuai Wang,
University of Manchester
Integrated Sludge Recovery and Deployment System for Nuclear Decommissioning

Shuai Wang
The University of Manchester
Barrnon Ltd
Problem to be solved

- Nuclear sludge recovery
- Deployment system

We need to:
- Comply the requirement of nuclear site
- Avoid radiation to human beings
Our solution

Bladecutter: Pond sludge recovery
Rotocutter: Hard sludge dig-out
HydroSpyder: Equipment deployment

Nuclear Decommissioning
Products demonstration

Potential customers:
• National Nuclear Lab - Sellafield
• Fukushima, Japan
• Hanford, US
• Hunterston, Scotland

Collaborators:
• 2nd largest engineering com in Japan - IHI
• University of Manchester
• Atkins
Academic contribution

Data analysis and prediction:
• The least amount of water to be consumed
• To remove as much sludge as possible
• Academic paper “Design requirement in nuclear decommissioning water and radiation environment: a case study” is in preparation for Journal of Engineering Design submission

Advanced controller design on HydroSpyder
Personal development

Technical
- Hands-on skills on Electrical & Mechanical design
- Advanced controller design & programming
- Machine learning and data prediction

Non-technical
- CMI Level 5 Management and Leadership diploma
- Chartered Engineer
- Project management
Next up:
Michael Taylor,
Queen’s University Belfast
WHERE ARE CYCLISTS GOING?

From the data we collect, we can deduce the most used routes within a city as well as:

- The busiest times for cycling
- Journey distances
- Average speeds for journeys
- Slowest areas for cyclists
ROUGH VS SMOOTH
IMPACTS
THANK YOU

Dr. Michael Taylor
Data Scientist
michael@seesense.cc
www.seesense.cc
Associate Presentations (pm)

- Anthony Simpson, University of Reading
- Hassan Al-Budairi, University of Glasgow
- Hadeel Safaa Saadoon, Queen’s University Belfast
- Elena Perez-Barrado, Keele University
- Louis Clift, University of Essex
- Robert Stewart, University of West of Scotland
Presentation:
Hassan Al-Budairi,
University of Glasgow
IMPROVING THE DESIGN OF ROCKFALL CATCH FENCES FOR RAILWAYS

Hassan Al-Budairi
KTP Associate
QTS Group Ltd
University of Glasgow
The problem

- Rockfall accidents have increased in the UK
- Causes significant damages, long delays and expensive repairs on railways
- An **effective** and a **cost efficient** rockfall catch fences design is needed to prevent these damages.

![Graph showing the increase in rockfall accidents in the UK from 1974 to 2015.](image)

**Major rockfalls in the UK recorded by British Geological Survey**

- **Rockfall accident (Falls of Cruachan, Scotland), 2010**
- **Derailed train (Loch Treig, Scotland), 2012**
The challenges

Catch fences

• Are located near train lines/ difficult to access areas.
• Should easily install to minimise service disruption
• Can withstand for long lifetime (50 years) and for high energy limits
• Need to be cost-effective structures
Development approach

Current design → Modelling → Analyses → Optimising → Improved design
## Benefits

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<tr>
<th></th>
<th>I - Basic catch fence design</th>
<th>II - Enhanced catch fence design</th>
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<tbody>
<tr>
<td>50% Materials</td>
<td></td>
<td>70% Materials</td>
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<tr>
<td>80% Energy dissipation limit</td>
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<td>Over 200% energy dissipation limit</td>
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- Current railway Scotland earthworks project (£18M p.a./ 5 years)
- New markets in other areas (South-west England and Wales)/ expected value £10M p.a. / 5 years
- Long partnership with QTS (new project/ 94K/ 6 months)
- 2 Journal papers/3 Conference papers/ 2 Unpublished conference works
- One of three shortlisted projects for Scottish Knowledge Exchange Awards 2017
- Another successful project is added to the KTP journey!
Results

An impact of 500kg spherical mass on the basic catch fence design at 6.3 m/s
Results

Doubling the velocity to test the material failure model
Thank you for your attention
Questions?
Next up:
Elena Perez-Barrado,
Keele University
Synthesis of inorganic materials with near infrared absorbing properties

Dr. Elena Pérez-Barrado
Keele University
Keeling & Walker Ltd.
Where are we located?
What is infrared radiation?
What is infrared radiation?

We feel infrared radiation as heat

Materials that reflect or absorb infrared radiation have numerous applications

Infrared lamps in a restaurant
Applications

Does the material reflect near infrared radiation?

- Glazing in buildings.
- Reflective surfaces in buildings (to avoid urban heat island effect).
- Energy-saving buildings.
- Greenhouses (agriculture).

Does the material absorb near infrared radiation?

- Glazing in cars.
- MID/3D technology (mobile phones).
- Security inks (banknotes, passports).
- Laser welding & marking.
How does the KTP programme help this project?

- Knowledge transfer between Keele University and Keeling & Walker Ltd.
  - R&D facilities
    - Instrumentation
    - Academic knowledge
  - Industrial experience
    - Upscaling facilities
    - Customer network for testing

- Budget for resources and personal development plan.
  - Reagents
    - Analysis
    - Consumables
  - Courses
    - Conferences
    - Exhibitions
    - CMI qualifications
Iterative product development

- **Product synthesis**
- **Product basic testing**
- **Upscaling**
- **Application testing at the customer**
- **Feedback and refinement of product synthesis**

Prototype testing for a customer
### Benefits of the KTP programme

| KTP Associate                  | Management & delivery of a project  
|                               | Improve CV (conferences, courses).  
|                               | CMI qualifications + training modules in Ashorne Hill.  
| Company                       | Revenue  
|                               | Knowledge transfer  
|                               | Improve position in the market  
| University                    | Knowledge transfer  
|                               | Publications in conferences & journals  

Synthesis of inorganic materials with near infrared absorbing properties

THANKS FOR YOUR ATTENTION

Dr. Elena Pérez-Barrado
Keele University
Keeling & Walker Ltd.
Next up:
Robert Stewart,
University of West of Scotland
Projecting KTP in the company
Dr Robbie Stewart

KTP Confidence
Paisley Housing Association
University of the West of Scotland
Innovate UK: West of Scotland KTP
Management Systems

Replaced every 10+ years
Low knowledge of IT systems
Cost between £250,000 and £1,000,000

RISK
Project Method for Procurement

RISK

Tied in contract
Years of fire-fighting
High staff turnover
Loss of confidence in management
Project Method for Procurement

Template outputs

Timetable planning

RISK

Resource Evaluation

Costs assessment
confidence: Business + Personal

“Lack of focus”    “Sponsor disengagement”

“Poor publicity”   “Project direction changes”

“Disinterested internal staff”

“Burnout”          “Unassigned responsibilities”

“Isolation”        “Frozen corporate culture”
“Write the script.”
confidence: Take Stock

Redraft the project plan

BEFORE

AFTER
Management whiteboard: calendar & issues

Confidence: Publicity

<table>
<thead>
<tr>
<th>CALENDAR</th>
<th>COMMS</th>
<th>ISSUES</th>
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### Staff whiteboard: Aims, Names & Gains

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<tr>
<th>WORKING GROUPS</th>
<th>DIARY</th>
<th>OUTPUT</th>
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<tr>
<td>Rents: AG, PS, RG</td>
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<tr>
<td>Complaints: TS, FT</td>
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**confidence: Publicity**
confidence: Control

Cloud-hosted project management software
confidence: Project Fluency

Give a lecture series

Attend KTP events

Book a conference

Programme

13:00  Lunch and Posters Presentations
14:00  Associate Presentations (2)
confidence: Recharging

Take scheduled holidays!
Be like Bill: Write the script