



TXX Name SURNAME



European research day 2016

Dr Samir Khan

University of Tokyo

Department of Aeronautics and Astronautics

JSPS Fellow

25/11/16



Agenda

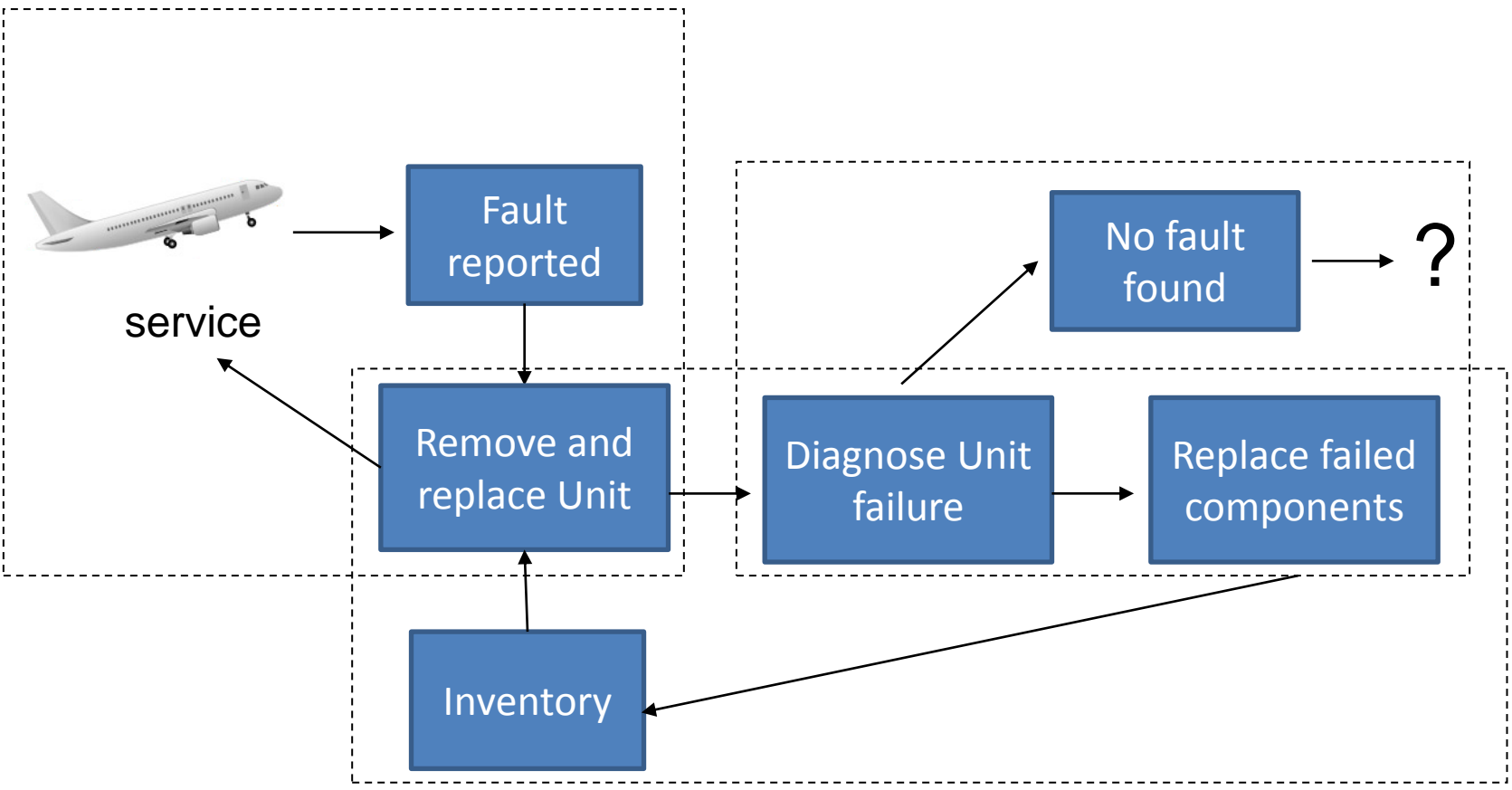
- Career overview
- Research background
- On-going work
- Long term research plan
- Why moving to Japan
- Experience so far... and future

- PhD in EEE 2010 (Loughborough)
- Currently a JSPS fellow since August 2016
- Lecturer in Aerospace at Coventry University UK
- Worked at Cranfield University UK (2011-2015) on FDI
 - Industries collaborated with: MoD, Rolls-Royce, BAE, Bombardier Transport, Case Bank Technologies, Flybe, Copernicus Tech, JLR
 - Universities collaborated with: Warwick, UC Berkley, Durham, Sheffield, Cambridge and Lincoln
- Worked at Thales Transport (2010-2011) on autonomous trains
- Research interests have been focused on control systems, power electronics, FDI, monitoring of intermittent faults and hidden failure issues in electronic systems
- Chartered Engineer IET

Do these problems sound familiar?

- Intermittent faults – sometimes it works, sometimes it doesn't
- Switching it OFF and switching it ON, fixes the fault.
- It only fails when it is hot, or when it is cold, or when it is damp.
- There's been the same fault for months, possibly years, and nobody is able to fix it.
- You've received a new or 'serviceable' part from the manufacturer and then find it is Defective On Arrival – and DOA means AOG (Aircraft on Ground)
- Cannot Duplicate (CND) fault on Test Equipment

Research background



On-going work



The use of Artificial Intelligence

- Motivation:
“Improve system resilience and potential cost benefits for maintenance, repair and overhaul activities”
- The use of AI for fault analysis
- The use of AI for prognostics
- The use of AI for data management

Long term research plan

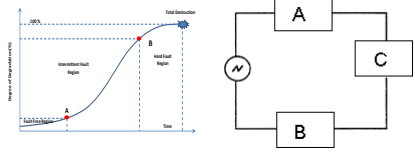
Output, outcomes and impact

Scoping – maintenance mark-up language; mainML



Human factors

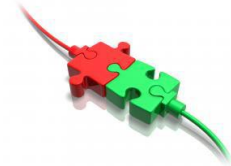
Investigate and analyse root causes



Theoretical propositions on use of robotics

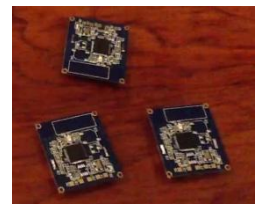


Sustainability – Counterfeiting

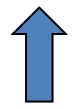


Interoperability of testability standards

Concept Demos



Use cases



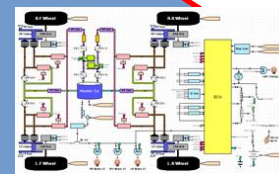
Build localisation mechanisms at component / sub-system level



Unit testing



Localisation using AI, machine learning



Informatics/ analytics



Environmental testing



Intermittent fault isolation strategies



IoT, sensor solutions for maintenance

Benchmarking and cost estimation tools



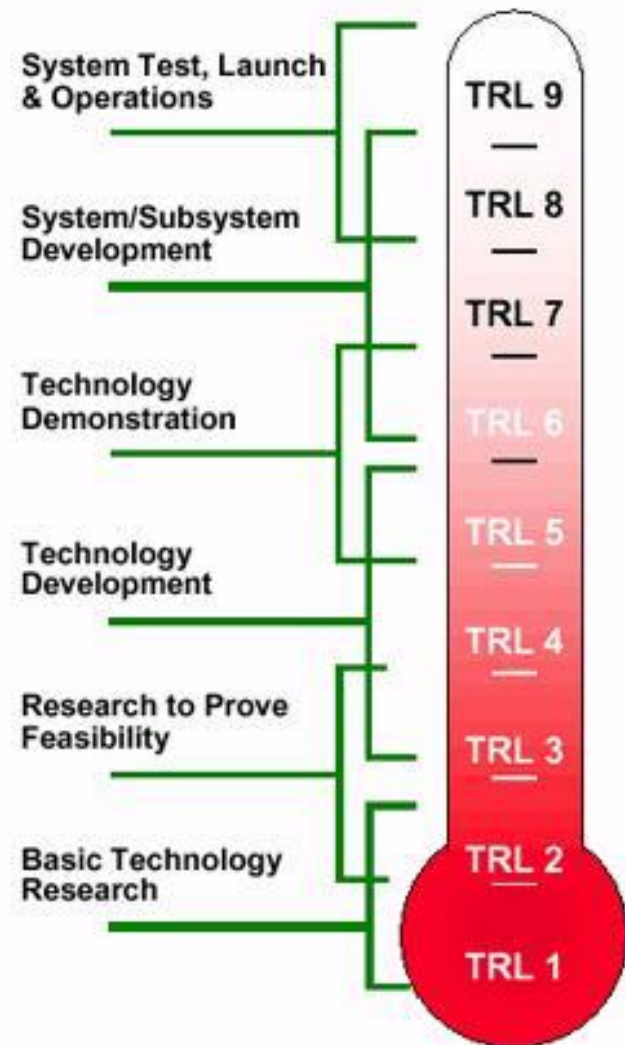
Standards and guidelines



Standard

Why moving to Japan

- Technology readiness level
- Trend in the last 5 years
- But... funding after Brexit
- Frozen out of grant proposals even though full member of the EU.
- EU partners are avoiding working with UK
- Too much uncertainty in UK
 - Teaching vs research



Experience so far...

- International researchers and students
- Working with a start up company
- English don't work and people won't understand your Japanese!
- Appreciation of culture

Future

- Again... I don't know where UK academia will be in two years
- Might be working in a research centre rather than a university

Dr Samir Khan

Khan@ailab.t.u-tokyo.ac.jp

