Living Securely in the Internet of Things, 16 June 2023
PETRAS Exhibition Short Summaries
12:00-19:00, Riverside Room

The Reappearing Computer
Dr. Nick Taylor & David Chatting
Newcastle University

The Reappearing Computer project (REAPPEAR) explores how we might design IoT technologies to cause hidden aspects of their behaviour — like the data the collect or the remote work being done elsewhere — to become more visible.
https://petras-iot.org/project/the-reappearing-computer-foregrounding-privacy-in-iot-reappear/

Graph Layer Security
Prof Weisi Guo, Sandya Kasthuri & Dr. Zhuangkun Wei
Cranfield University

Graph Layer Security - Securing IoT and Autonomy using Connected Physical Attributes: We aim to demonstrate using a real-world platform and video recording of other platforms on how cybersecurity cipher keys can be generated from physical world connected attributes such as water pressure in pipes and control states of swarm drones. These physical features are near impossible to eavesdrop on and can be used to secure the digital data.

PrivIoT
Dr. James Nicholson
Northumbria University

Have you ever considered using smart devices for helping you save energy at home? In this stand we will discuss possible advantages and harms of adopting these devices using a quick interactive ranking activity and through simple demonstrations of these (demand-side management) technologies.
https://petras-iot.org/project/understanding-and-mitigating-privacy-risks-of-iot-homes-with-demand-side-management-priviot/

Design Informatics
Prof Chris Speed, Alexandre Colle and Billy Dixon
The University of Edinburgh

The Institute for Design Informatics presents a series of prototypes that represent the design possibilities of a next generation of Social Internet of Things. From a pair of kettles that explore the social impact of algorithmic transactions within decentralised systems of energy generation and consumption, to a robot that provides companionship and care through non-invasive data capture and sensing, Design Informatics hopes to inspire and question what social good looks like within an Internet of Things.

Electric Feels
Dr. Ola Michalec, University of Bristol & Joe Bourne, Lancaster University

Electric Feels showcases the original work of four illustrators' that takes an often-speculative approaches to exploring the intersection of energy, digital technology and emotions. The works invite viewers to consider: What's your vision for a sustainable future? How do you feel about computers telling you how to save energy? Have recent innovations actually improved your use and experience of energy? How could your domestic routines and chores change as a result of future energy innovations?
https://petras-iot.org/update/electric-feels/

Edge of Tomorrow
Dr. Adrian Gradinar
Lancaster University

Come and play 'Prometheus', the 'Edge of Tomorrow' project's arcade game in which you play as a hacker exploiting vulnerabilities of IoT and see the impact IoT and keeping it secure has on the environment.
https://petras-iot.org/project/edge-of-tomorrow-understanding-the-impacts-of-iot-cybersecurity-and-datafication-to-co-design-a-sustainable-edge-et/

Participatory Policies for Public IoT (At the Edge) Ethics
Dr. Naomi Jacobs & Nuri Kwon,
Lancaster University

Experience the speculative design methods of P-PITEE which help local authorities to design participatory policies for public IoT deployment; will you be able to tell the fictional urban IoT deployments from the true ones.
https://petras-iot.org/project/participatory-policies-for-iot-at-the-edge-ethics-p-pitee/

HIPSTER
Dr. Charles Weir & Anna Dyson
Lancaster University

Ruthless Security with the Hipster project! Join us here to see how to run developer workshops using risk assessment and industry risk information to make the hard choices what IoT security to implement—and what to omit!
https://petras-iot.org/project/health-iot-privacy-and-security-transferred-to-engineering-requirements-hipster/

PT.HEAT
Dr. Mohamed Khamis & Shaun Macdonald
University of Glasgow

PT.HEAT will show the security threat of Thermal Attacks with a hands-on demonstration of how thermal cameras can see passwords after you've entered them and how we can protect against this!
https://petras-iot.org/project/preventing-thermal-attacks-pt-heat/

ICE-AI

Dr. Bronwyn Jones, The University of Edinburgh; and Dr. Rhia Jones, BBC R&D

Can you detect a deepfake? Tell fact from fiction when AI-generated synthetic media is blurring the lines between representation and reality? Join us to try out your journalistic skills, work through the ethical dilemmas facing public media, and learn about how our user partner, the BBC, is responding to new threats posed by generative AI.
https://petras-iot.org/project/intelligible-cloud-and-edge-ai-ice-ai/

FARM

Yue Gu
University of Glasgow

FARM addressed challenges in the adoption of Agritech by defining a new Digital Twin framework based on models enabling multiscale runtime analysis, dynamic forecasting, and process optimisation. Their exhibit will showcase the new digital framework and share learnings from the research.
https://petras-iot.org/project/formal-methods-for-agritech-resilience-modelling-farm/

PRISM

Vadim Safronov, Dr. Anna Mandalari & Dr. Hamed Haddadi
Imperial College London

The PRISM demo demonstrates a possibility of resource-efficient IoT threat detection locally, on a home WiFi router, as opposed to cloud-based safeguards approach which has questionable performance of IoT threat protection and also can lead to potential privacy risks according to the recent research. Attendees will see a network of consumer IoT devices connected to a home router and performing daily smart-home activities. A number of common IoT attacks (DDoS, port/OS scanning, anomalous traffic, etc.) will be performed by an adversarial node in the demo network. The performance of attack detection will be demonstrated on a screen depicting router alerts for each generated attack along with live graphs of router resource usage such as CPU and RAM consumption.
https://petras-iot.org/project/privacy-preserving-iot-security-management-prism/

SPiSE

Sebastian Kohler & Jack Sturgeon,
University of Oxford

Interact with the SPiSE projects demonstration of their research which takes advantage of biometric data to verify the users of wearables and electric vehicle charge cables.
https://petras-iot.org/project/secure-payments-in-smart-environments-spise/