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United Kingdom 4.0: Self-repairing cities

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Our vision is that of a city where infrastructure is autonomously maintained and dynamically responsive, focused on: securing the health and wellbeing of its citizens; contributing to flourishing and sustainable natural systems in the city; and creating positive economic and societal outlooks. Towards our vision we will tackle the Grand Challenge: Zero disruption from Street Works in UK Cities by 2050. Our strongly interdisciplinary team aspires to fulfil our Grand Challenge through pioneering scientific research (and research methods) into: autonomous systems for minimally invasive infrastructure sensing, diagnosis and repair; development of advanced robots for deployment in complex live city environments; and the socio-technical intricacy of the robot - human - natural systems interfaces. We will develop pioneering robot designs, technical implementations and socio-economic impact cases linked to specific application requirements, starting with three case-study systems: "Perch and Repair" remote maintenance and modernisation of lighting columns to promote their use as multifunctional platforms for city communication nodes; "Perceive and Patch" Swarms of flying vehicles for autonomous inspection, diagnostics, repair and prevention of highway defects (e.g. potholes); "Fire and forget" hybrid robots designed to operate indefinitely within live utility pipes performing inspection, repair, metering and reporting tasks. Additionally, we will also exploit the research outcomes to develop potential strategic ideas towards Thailand 4.0. The research work is fiscally supported by the UK Engineering and Physical Sciences Research Council (EPSRC) with total budget of £4.2M (approximately THB 186M).

Keywords: smart cities, industry 4.0, self-repairing cities, autonomous systems

References:

1. <http://selfrepairingcities.com/>



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