



# ROBOTS FOR RESILIENT INFRASTRUCTURE

**An International Robotics Challenge Event**

27 and 28 June 2017

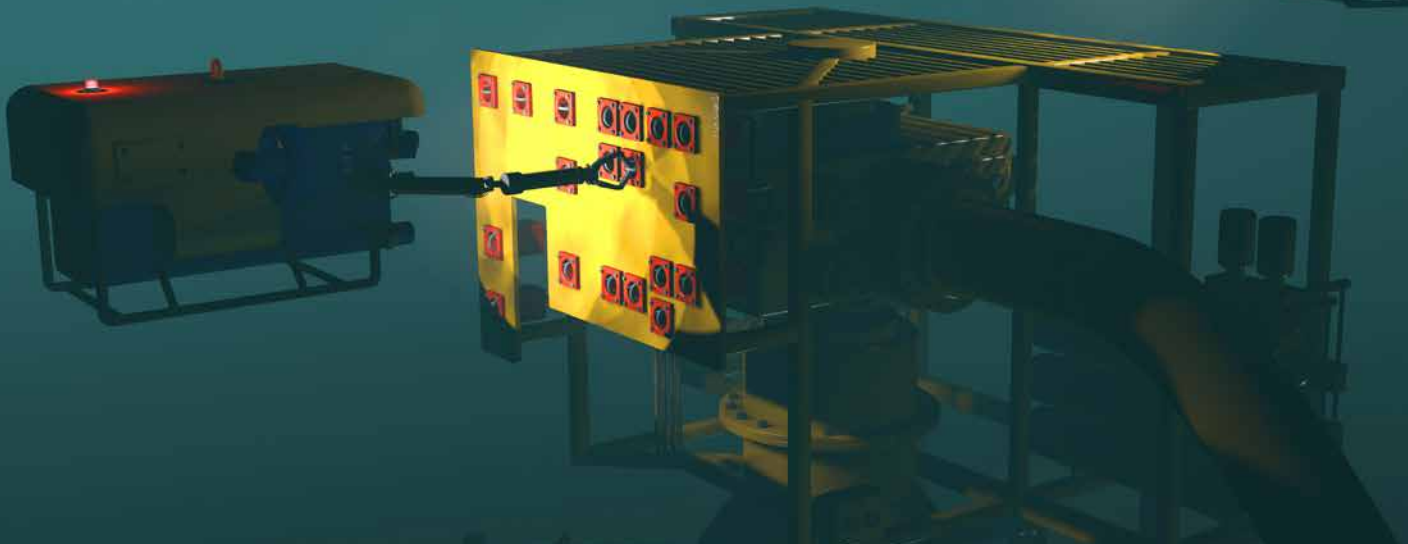
University of Leeds, Leeds, UK

*'In the air, on the ground, underground and underwater – robots to create, inspect, repair and maintain the physical infrastructure of our everyday lives'*

A two day challenge event to bring academics, industry, policy makers and stakeholders together to explore a future use of robots in the creation, inspection, repair and maintenance of critical infrastructure. Application areas are across broad domains including civil infrastructure, transport (rail, road, sea), offshore energy, space, and nuclear.

The challenge is supported by The Engineering and Physical Science Research Council (EPSRC) through the Grand Challenge of "Balancing the Impact of City Infrastructure Engineering on Natural Systems using Robots" and EPSRC investment in capital equipment. It is organised in collaboration with the UK RAS Network and UK Robotics Week. Cash prizes of £5K are generously provided by Kier Group.

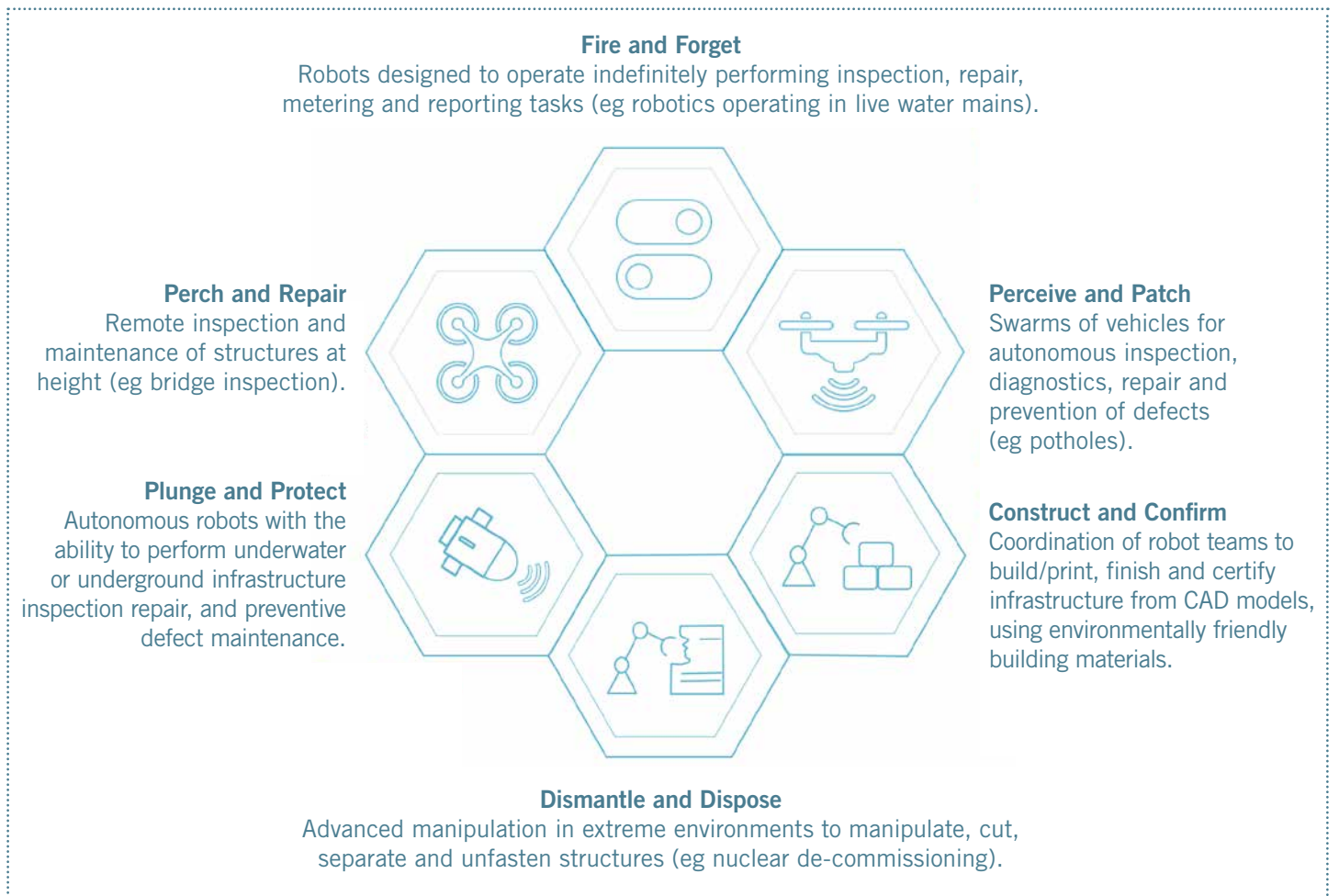




# The challenge

The underpinning technological challenges for infrastructure robots include:

- i) Perceive and patch, ii) Perch and repair, iii) Plunge and protect,
- iv) Fire and forget, v) Construct and confirm, vi) Dismantle and dispose.



Robotics systems are well suited to enable resilient infrastructure through increased infrastructure operational life cycle and productivity, reduction of costs and operator risk, minimisation of environmental impact, and improved quality of data collection.



# Attend the event

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## As a delegate

See live demonstrations of robots, find out more information on the latest robotic technology, and discuss future challenges. The free-to-attend two day event will feature keynote presentations from leading academics, industrialists and policy makers. During the event, you will have an opportunity to present posters on technological innovations or scientific positions.

## As a competitor

We are seeking entries from robotic researchers around the world who wish to demonstrate their robotic technologies to delegates at the event. Entries will be judged by a panel of leading academics and industrialists on the basis of innovation, potential for impact, and style. Prizes awarded will be awarded for the best entrants! The competition is free to enter and competition attendees will be provided with free bed and breakfast in on campus facilities.

It is a freestyle competition, and we welcome entries of all robotic systems with the potential to impact on the challenges facing future infrastructure.

The competition will operate a two stage process:

- i) You will submit a video of your robot and a short description of its purpose and function. The videos will be judged and finalists will be invited to demonstrate their robots at the infrastructure challenge event in Leeds, UK.
- ii) A judging panel of leading robotic and infrastructure experts will observe your robots in action and prizes will be awarded.

Appropriate demonstration environments will be created by the local team and they will ensure as far as possible that correct support systems are available to operate your robots. There are a range of air and ground robots available to support demonstrations by mounting sensors or demonstrate particular algorithms (for example UAVs such as DJI SJ1000 and Inspire; Husky Ground robot; and Denso robot arms).

**Please contact the event organisers for more information.**

## Exhibitors

There will be a limited number of exhibitor stands for those bringing physical robots and not taking part in the competition.

**Please contact the event organisers for more information.**



# The venue

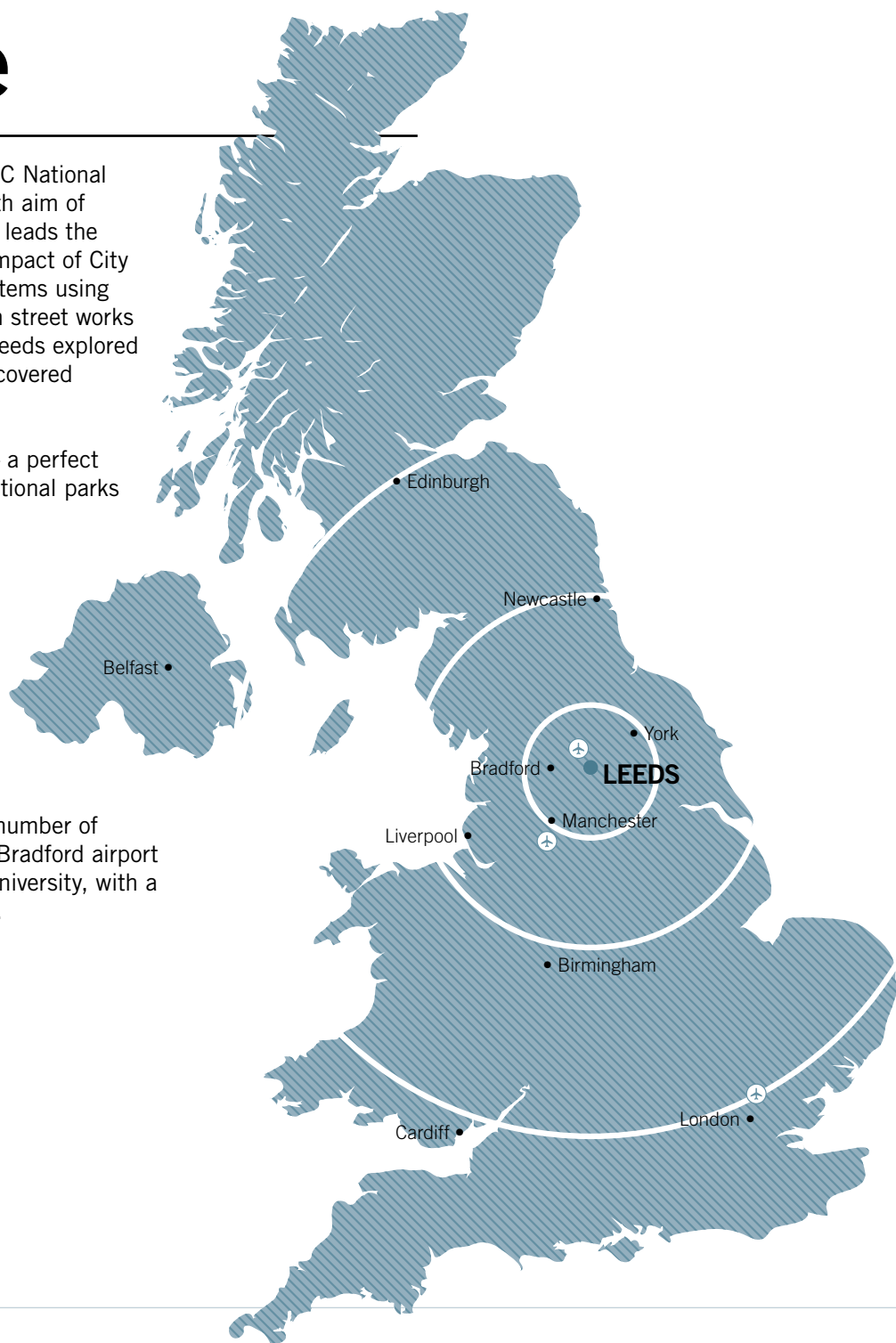
The University of Leeds houses the EPSRC National facility for Innovative Robotic Systems with aim of physically creating robots of the future. It leads the EPSRC Grand Challenge 'Balancing the Impact of City Infrastructure Engineering on Natural Systems using Robots' that aims for Zero disruption from street works by 2050. Robots from the University of Leeds explored the Great Pyramid of Giza, Egypt and discovered writing hidden for thousands of years.

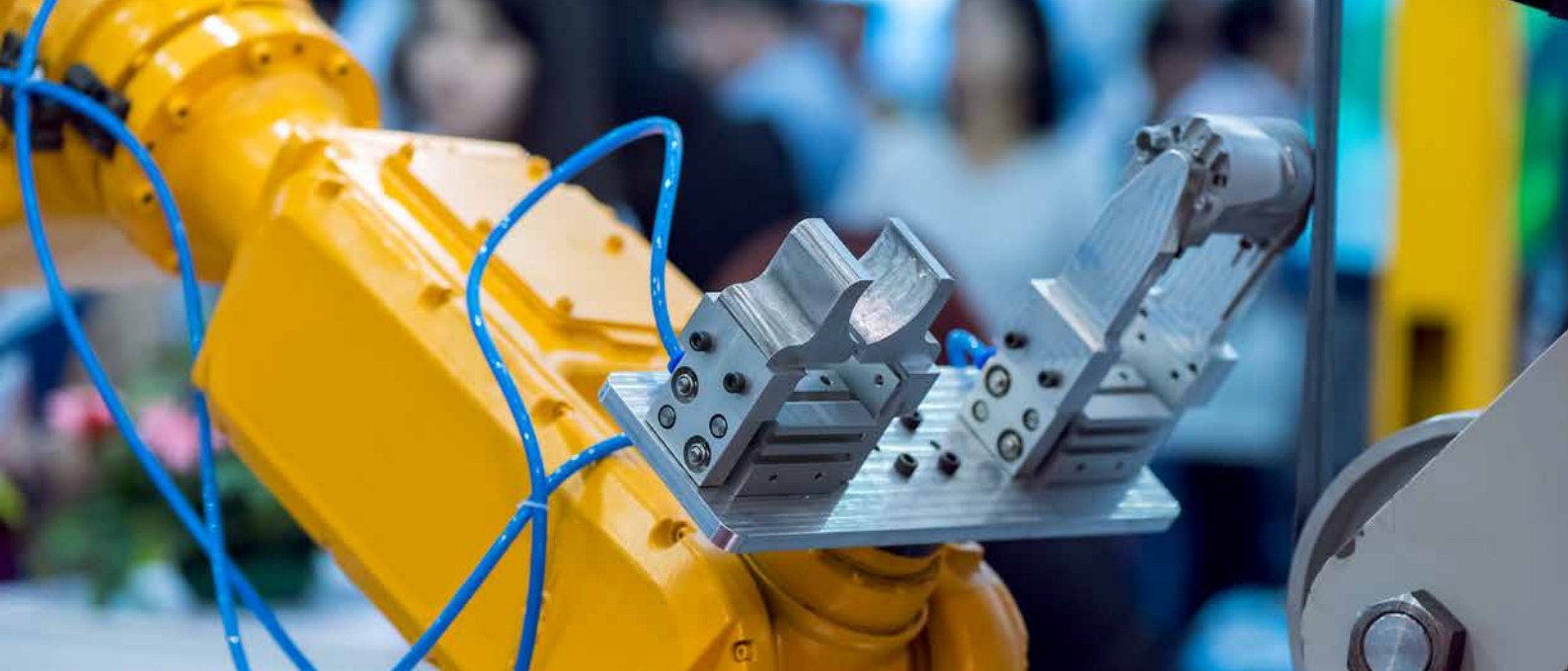
Leeds is based in the heart of Yorkshire – a perfect mix of city and countryside life, with 3 national parks on its doorstep.

## Getting here

**By Train:** Leeds Station connects us with all major UK cities and has a fast and efficient London service.

**By Air:** Leeds is served by two major airports: Leeds Bradford and Manchester. Regular flights are available from a huge number of European and International cities. Leeds Bradford airport is approximately 8 miles away from the University, with a bus service or inexpensive taxi to the city.





# Key dates

Activity	Date	Description
<b>Registration: Open for delegates</b>	8 December 2016	Delegates may register for the event through a short online form <a href="http://selfrepairingcities.com/outputs/robots-resilient-infrastructure">http://selfrepairingcities.com/outputs/robots-resilient-infrastructure</a>
<b>Challenge teams: Expression of interest due. Complete 1 page application form</b>	<b>Extended until 19 April 2017</b>	To register your interest in taking part in the challenge, please submit the application form available here <a href="https://www.eventbrite.co.uk/e/robots-for-resilient-infrastructure-registration-30024533187">https://www.eventbrite.co.uk/e/robots-for-resilient-infrastructure-registration-30024533187</a>
<b>Challenge teams: First round 2 minute preview video</b>	<b>Extended until 19 April 2017</b>	For the first round, you need to submit a two minute video of your robotic technology. This video should introduce the motivation, propose your technology, provide a demonstration of your technology in action and present its potential impact.  The first round will be used to determine which entries get through to the competition finals. Shortly after the submission deadline, the completion organisers will inform you whether your entry is shortlisted for the competition finals in Leeds. Send Link to: <a href="mailto:B.Kaddouh@leeds.ac.uk">B.Kaddouh@leeds.ac.uk</a>
<b>Challenge teams: Final 2 minute preview video</b>	1 June 2017	If you get through to the finals, you will have the opportunity to further improve your two minute preview video that will be shown to the judging panel. Please ensure all content is copyright-free as the videos will be made available on the challenge website and social media.  In addition to the video, please send a slideshow that you will show to the judging panel. The slideshow should consist of six slides and take six minutes to present. Also please fill in the two page paper template available the completion website.
<b>Challenge teams: Live demonstration in Leeds</b>	27 June – 28 June 2017	You will be given a slot during which you will need to set-up and demonstrate your innovation on Wednesday 28th June to an audience and the judging panel. You will be also have time on Tuesday 27th to practice your demo. If you require more time to setup and practice, facilities will be available on Sunday 25th June and Monday 26th June.
<b>Challenge teams: 10 minute presentation in Leeds</b>	28 June 2017	You will have a total of 10 minutes to impress the judging panel. First of all, your 2-minute presentation preview video will be shown. You should then give your 6-minute presentation. There will be 2 minutes of questions.



# Contact details

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Please contact us if you have any queries:

## Event co-ordinator

**Dr Bilal Kaddouh**

**E:** B.Kaddouh@leeds.ac.uk

## General Chair

**Professor Robert C Richardson**

Director of the Institute of Design, Robotics and Optimisation (iDRO)  
and Director of the EPSRC National Facility for Innovative Robotic Systems

**E:** R.C.Richardson@Leeds.ac.uk

## Local Steering Committee

**Dr Jordan Boyle** School of Mechanical Engineering

**Prof Netta Cohen** School of Computing

**Prof Anthony Cohn** School of Computing

**Prof Abbas Dehghani** School of Mechanical Engineering

**Dr Charles Fox** Transport Studies

**Dr Raul Fuentes** School of Civil Engineering

**Dr Jongrae Kim** School of Mechanical Engineering

**Prof Phil Purnell** School of Civil Engineering

**Prof Ian Robertson** School of Electrical and Electronic Engineering

More information can be found on

<http://selfrepairingcities.com/outputs/robots-resilient-infrastructure>



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