



# EuRoC in a Nutshell

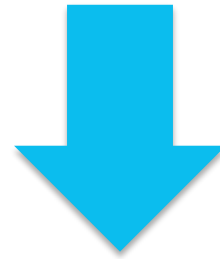
Niels Jepsen

*InnoCentive*



# The Motivation

The European manufacturing industry needs competitive solutions to keep global leadership in products and services



## **EuRoC project**

- Question the status quo
- Showcase potential of robotics challenges
- Develop innovative products and services



# The EuRoC Consortium



**KUKA**

**ASCENDING  
TECHNOLOGIES**



**Fraunhofer  
IPA**

**LAAS-CNRS**



United  
Kingdom

Germany

France

Switzerland

Italy

**INNOCENTIVE®**

**ETH** Zürich

**ALSTOM**  
Inspection Robotics



- **Three industry-relevant Challenges**
  - Open call framework
  - Three stages of increasing complexity (incl. application experiments)
  - Financial support
  - Benchmarking and performance evaluation



**Reconfigurable Interactive  
Manufacturing Cell**



**Shop Floor Logistics  
and Manipulation**



**Plant Inspection  
and Servicing**



# The Objectives



- 1. Successfully run the three challenges**
  - Involving whole supply chains within manufacturing, logistics and servicing and fostering collaboration
- 2. Empower robotics platforms and benchmark infrastructures**
- 3. Ensure sustainability and adaptability to end users**
- 4. Draw attention to the European Robotics industry**

## Reconfigurable Interactive Manufacturing Cell

- **Motivation**: to develop a new generation of flexible, adaptable, collaborative robotic work cell
- **RTD issues**: multi-role multi-arm cooperative robot systems, perception and cognitive skills, safe and effective human–robot collaboration
- **Research experts**: CREATE-PRISMA Lab, CNRS-LAAS, DLR, IPA
- **Technology supplier**: Open, as IPA can provide support to a range of different robot models and components
- **System integrator**: IPA / Open, as teams can recruit their own system integrator
- **Platform host**: IPA
- **Benchmark environment**: ARENA 2036 research factory with multiple robot cell setups for different production operations, as well as a mechanical workshop and an electronics lab for engineering of different tools and grippers





# Challenge 2



## Shop Floor Logistics and Manipulation

- **Motivation**: value creation beyond mere logistics of goods (which is already an update of the EUROP SRA application scenario “logistics”)
- **RTD issues**: navigation on dynamic shop floor, coping with uncertainties by means of 3D vision and compliant manipulation and grasping, true mobile manipulation to improve cycle time, safe human-robot coexistence
- **Research experts**: DLR, KUKA Labs, CNRS-LAAS
- **Technology supplier**: KUKA Labs (omniRob with Light-weight robot)
- **System integrator**: KUKA Roboter, KUKA Systems
- **Platform host**: DLR
- **Benchmark environment**: realistic factory set-up with elements from manufacturing of real end users



# Challenge 3



## Plant Servicing and Inspection

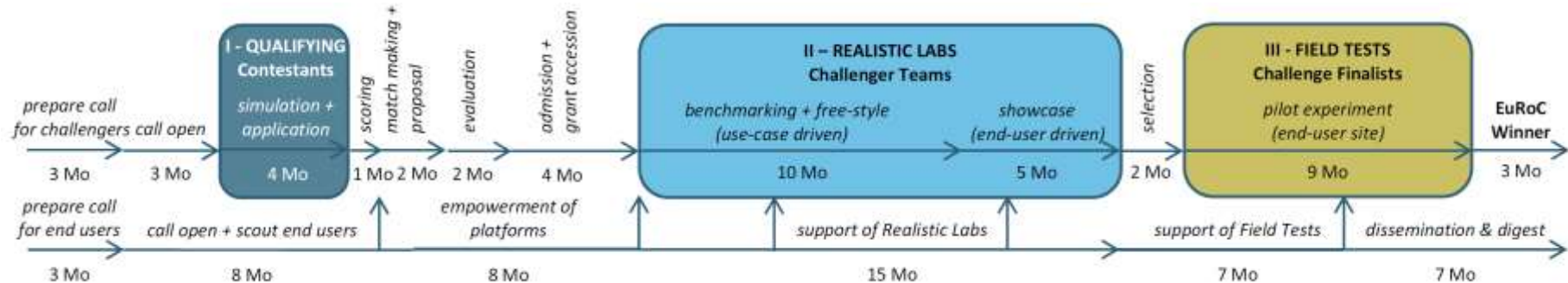
- **Motivation**: inspection through micro aerial robots (MAV) opens absolutely new applications in servicing of large plants and infrastructures
- **RTD issues**: highly reliable vision-only navigation, dynamic control of MAVs in challenging industrial environments, high-level task allocation by mission expert, e.g. "follow this wall"
- **Research experts**: ETHZ, CREATE-PRISMA Lab, DLR
- **Technology supplier**: Ascending Technologies
- **System integrator**: Alstom Inspection Robotics
- **Platform host**: ETHZ
- **Benchmark environment**: realistic set-up on an industrial infrastructure, e.g. pipework and infrastructure for energy-/fuel-/operating material supply, tanks and storages





# The Project Timeline

- **Launch:** 1 April 2014
- **Three challenges articulated in three stages**
  - QUALIFYING
  - REALISTIC LABS
  - FIELD TESTS
- **Duration:** 48 months



## Stage I – QUALIFYING [4 Mo]

### PART A: Call for Challengers (and End Users)

- 1 page pitch: team description and challenge objectives
- Submit to simulation test (up to 30 teams per Challenge)
  - *Scoring according to objective metrics*

→ **The best 3 × 15 are selected**

### PART B: Advance to Stage II (Realistic Labs)

- Match-making event: Challengers team up with end users and system integrators
- Each team submits 15-page proposal
  - *Evaluation by Challenge Advisors and independent experts*

→ **The best 3 × 5 are selected**

## Stage II – REALISTIC LABS [15 Mo]

### PART A: Benchmarking + freestyle [10 Mo]

- Teams will receive funding to prepare Round A
- Mid-term evaluation at Automatica 2016
  - *Challenge Advisory Board and team of independent experts decide admission to Round B*

### PART B: Showcase [5 Mo]

- Teams will receive funding to prepare Round B
- End-user driven task aimed at showcasing customizability under realistic conditions
  - *Challenger teams will be ranked according to objective metrics by Advisory Board and independent experts*

→ **The best 3 × 2 are selected**

## Stage III – FIELD TESTS [9 Mo]

### Pilot experiments

- Teams will receive funding to prepare field tests
- 3 x 2 teams will do experiments under real conditions at end-user site (demonstrated at public event)
  - *Finalists will be undergo final evaluation by a Board of Judges*

→ **1 EuRoC winner is selected**

# The Project Lures

- 1. Cumulative sum of € 7 M grant money available to the Challengers**
  - 30 Teams will receive up to € 5 K each in the first stage
  - 9 Teams will receive up to € 375 K each in the two stages
  - 6 Teams will receive up to € 585 K each in the three stages
- 2. Added value of the challenge experiments**
  - Benchmark new algorithms and solutions on three first-class European hosting platforms
  - Test algorithms them at end-user site in the final stage
  - Open access to platforms
  - Full support from local hosts and end users
  - Financial support available to cover personnel and travel/lodge costs
- 3. Formation of Challenger teams**
  - Gain business experience
  - Great networking opportunities

## Call for Challengers

- Publication: 1 April 2014
- Deadline: 1 July 2014

## Call for End Users

- Publication: 1 April 2014
- Deadline: ~15 November 2014



[www.euroc-project.eu](http://www.euroc-project.eu)



The screenshot shows the website's header with the logo and navigation menu. The main content area features a welcome message, a quote, and three challenge categories: Reconfigurable Interactive Manufacturing Cell, Shop Floor Logistics and Manipulation, and Plant Inspection and Servicing. A news section on the right highlights a meeting on 17.10.2013.

**European Robotics Challenges**

Home Project Consortium Challenges EuRoC Call Public Relations Related Activities

## Welcome to the European Robotics Challenges

*"The European manufacturing industry needs competitive solutions to keep global leadership in products and services."*

Partner of

### I4MS

ICT Innovation for Manufacturing SMEs  
+ [www.i4ms.eu](http://www.i4ms.eu)

### News

17.10.2013

#### EuRoC@I4MS

2013-10-17 08:00 CET

Representatives of all projects involved in the I4MS initiative met in Brussels on the 11th of October to discuss joint market visibility, synergies among projects etc.

In the... [read more](#)

+ [go to news archive](#)

Reconfigurable Interactive Manufacturing Cell

Shop Floor Logistics and Manipulation

Plant Inspection and Servicing

Since the eighteenth-century Longitude Prize and the 1927 Orteig Prize as well as the challenges of today on driverless vehicles and suborbital spaceflight, there are great examples of challenges driving innovation. Aimed at extraordinary breakthroughs, storied outcomes or multiple innovation returns on the total programme costs, all of these initiatives share the strive for questioning the status quo.

The application of challenge-driven approaches are literally infinite. And the buzz surrounding



# Further Questions



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# European Robotics Challenges

