

FRAUNHOFER INSTITUTE FOR
MANUFACTURING ENGINEERING AND AUTOMATION IPA

EUROPEAN ROBOTICS CHALLENGES
SHOWCASING WORKSHOP
MAY 16–17, 2017 | STUTT GART



EuRoC consists of three industry-relevant Challenges in the scenarios of

- 1) Reconfigurable Interactive Manufacturing Cell,
- 2) Shop Floor Logistics and Manipulation and
- 3) Plant Servicing and Inspection.

The three EuRoC Challenges are organized into three successive stages, which increase in complexity from simulation to real work environments.

Stage 1 consisted of a simulation contest and a written proposal from which 15 Challenger Teams (5 per Challenge) advanced to Stage 2 and received funding up to € 375K each to further develop their solutions.

In Stage 2, the 15 Challengers were given access to the leading robotics platforms in Europe, and supported by the challenge hosts (Fraunhofer IPA, DLR and ETHZ) in their developments.

Only 6 teams (2 per Challenge) will make it into the final Stage 3 with an additional funding of € 210K each, where the finalists will compete at a public event to demonstrate their solutions in practical field tests, before 1 EuRoC winner is finally announced.

In this workshop organized by Fraunhofer IPA, the 15 teams will present their developments to an evaluation board composed of leading robotics experts from research and industry, in order to determine the 6 teams advancing to the next stage.

The workshop language is English.

We are looking forward to welcoming you at Fraunhofer IPA at our workshop.

Stuttgart, April 2017



EuRoC has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 608849.

THE EVENT AT A GLANCE

OBJECTIVES

Within the research project EuRoC (European Robotics Challenges) 15 teams from all over Europe composed of research organization, system-integrators and end-users competed w.r.t. development of innovative applications in the domains of manufacturing, logistics and inspection.

In this workshop the 15 teams will be presenting their results. The participants have the opportunity to obtain most recent information on new technologies, components, tools and trends.

WORKSHOP TOPICS

- Reconfigurable Interactive Manufacturing Cells
- Shop Floor Logistics and Manipulation
- Plant Servicing and Inspection

TARGET AUDIENCE

The workshop addresses system integrators that aim at providing flexible, economic and manufacturer independent automation solutions, executive personal of small and medium enterprises as well as R&D divisions of larger companies in the field of automation, logistics and production.

PROGRAMME

TUESDAY, MAY 16, 2017

SESSION CHAIR: PROF. BRUNO SICILIANO

8:00 Get Together

8:30 Prof. Bruno Siciliano
CREATE & University of Naples Federico II
Welcome and Introduction

CHALLENGE 1 "RECONFIGURABLE INTERACTIVE MANUFACTURING CELL"

9:00 **PIROS: Cooperative, safe and reconfigurable
robotic companion for CNC pallets load/unload
stations**

- National Council of Research of Italy, Institute of Industrial Automation (CNR-ITIA)
- IK4-Tekniker (IK4-Tekniker)
- Telerobot Labs S.r.l. (TLABS)
- Machining Centers Manufacturing S.p.A. (MCM)

9:35 **FLAAIR: FLeXible Automotive Assembly with
Industrial Co-WorkERs**

- Research Center for Information Technology (FZI)
- MRK-Systeme GmbH (MRK)
- Adam Opel AG (OPEL)

PROGRAMME

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SESSION CHAIR: PROF. BRUNO SICILIANO

- 10:10 **ITRXcell: Learning-based approach for robotized coils winding**
- University of Padova (UniPD)
 - IT+Robotics S.r.l. (IT+R)
 - STAM S.r.l. (STAM)
 - Institutul de Cercetari Electrotehnice (ICPE)
- 10:45 **Coffee Break**
- 11:15 **EUSMART: Reconfigurable Assembly Cell for Highly Dexterous and Intelligent Operations**
- Laboratory for Manufacturing Systems & Automation, University of Patras (LMS)
 - Telerobot Labs S.r.l. (TLABS)
 - Europea Microfusioni Aerospaziali S.p.A. (EMA)
 - AEA s.r.l. – Loccioni Group (LOCCIONI)
- 11:50 **NimbRo Manufacturing: robolink® feeder – Flexible Energy Chain Assembly Automation with a Lightweight Cable-driven Robot**
- Rheinische Friedrich-Wilhelms-Universität Bonn (UBO)
 - igus GmbH (IGUS)
- 12:25 **Open Discussion of Challenge 1**

PROGRAMME

TUESDAY, MAY 16, 2017

SESSION CHAIR: PROF. BRUNO SICILIANO

13:00 Lunch

CHALLENGE 2 "SHOP FLOOR LOGISTICS AND MANIPULATION"

14:00 **RSAll: Flexible robotized unitary picking in collaborative environments for order preparation in Distribution Centers**

- IK4-Tekniker (IK4-Tekniker)
- University of the Basque Country (UPV)
- ULMA Manutencion S.Coop. (ULMA)

14:35 **MTC-LU-UOB-Airbus: Joint Robot-Human Logistics and Assembly in Aerospace**

- Manufacturing Technology Centre (MTC)
- Loughborough University (LU)
- University of Birmingham (UoB)
- Airbus Operations GmbH (Airbus)

15:10 **AutoMap: AUTonomous mobile MAniPulation system**

- Fondazione Istituto Italiano di Tecnologia (IIT)
- European Organization for Nuclear Research (CERN)

15:45 Coffee Break

PROGRAMME

TUESDAY, MAY 16, 2017

SESSION CHAIR: PROF. BRUNO SICILIANO

- 16:15 **TIMAIRIS: Autonomous Blank Feeding for Packaging Machines**
- Universidade de Aveiro (UAVR)
 - Industria Macchine Automatiche S.p.A (IMA)
- 16:50 **NimbRo Logistics: KittingBot – Mobile Manipulation for Part Sequencing and Kitting in Automotive Logistics**
- Rheinische Friedrich-Wilhelms-Universität Bonn (UBO)
 - Peugeot Citroën Automobiles S.A. (PSA)
- 17:25 Open Discussion of Challenge 2
- 18:00 End of Day 1

PROGRAMME

WEDNESDAY, MAY 17, 2017

SESSION CHAIR: PROF. BRUNO SICILIANO

CHALLENGE 3 "PLANT SERVICING AND INSPECTION"

- 9:00 **TUM Flyers: Vision-based MAV Navigation for Systematic Inspection of Structures**
- Technische Universität München (TUM)
 - Schällibaum AG (SLB)
- 9:35 **GRVC-CATEC: Aerial Robot Co-Worker in Plant Servicing**
- Group on Robotics, Vision and Control, University of Seville (GRVC)
 - Fundación Andaluza para el Desarrollo Aeroespacial – Center for Advanced Aerospace Technologies (CATEC)
 - Airbus Defence and Space S.A. (Airbus DS)
- 10:10 **NimbRo Copter: ChimneySpector – Inside/out side chimney and smoke pipe inspection by aerial robots**
- Rheinische Friedrich-Wilhelms-Universität Bonn (UBO)
 - CRN Management GmbH (CRN)
- 10:45 **Coffee Break**

PROGRAMME

WEDNESDAY, MAY 17, 2017

SESSION CHAIR: PROF. BRUNO SICILIANO

- 11:15 **EIFFEL: Autonomous damage Inspection in Power Substation**
- ONERA The French Aerospace Lab (ONR)
 - Université Pierre et Marie Curie (UPMC)
 - Réseau de Transport d'électricité (RTE)
- 11:50 **BladeHunters: Wind generator remote inspection system**
- University of Zagreb, Faculty of Electrical Engineering and Computing (UNIZG-FER)
 - University of Dubrovnik (UNIDU)
 - Diagnostiqa Consultoria Tecnica S.L. (DQA)
- 12:25 Open Discussion of Challenge 3
- 13:00 Lunch
- 14:00 Lab Tours at IPA
- 15:00 End of public part of the Workshop

PROJECT COORDINATOR
CHALLENGE HOSTS
EVALUATION BOARD

PROJECT COORDINATOR

Prof. Bruno Siciliano

Professor of Control and Robotics

CREATE & University of Naples Federico II, Italy

CHALLENGE HOSTS

Dipl.-Ing. Bernd Winkler (Fraunhofer IPA)

Dr. Christian Ott (DLR)

M.Sc. Zachary Taylor (ETHZ)

EVALUATION BOARD

Prof. Antonio Pedro Aguiar (University of Porto)

Prof. Oussama Khatib (Stanford University)

Prof. Ron Lumia (University of New Mexico)

Prof. Raj Madhavan (University of Maryland)

Prof. Andreas Müller (Johannes Kepler University Linz)

Eng. Kris Kydd (Total)

Prof. Kostas Kyriakopoulos (University of Athens)

Dipl.-Volksw. Patrick Schwarzkopf (EUnited Robotics)

Prof. Marilena Vendittelli (University of Rome »La Sapienza«)

REGISTRATION

CONTACT

Dipl.-Wi.-Ing. Ramez Awad
Fraunhofer Institute for
Manufacturing Engineering and Automation IPA
Department Robot and Assistive Systems

Nobelstrasse 12 | 70569 Stuttgart | Germany
Phone +49 711 970-1844
ramez.awad@ipa.fraunhofer.de

We request registrations for the participation

- Online at <http://www.euroc-project.eu/index.php?id=eurocshowcasingworkshop> or
- With a formless mail containing the participant's name and adress to ramez.awad@ipa.fraunhofer.de

The deadline for registration is Tuesday, May 9, 2017.

The number of participants is limited. The registrations will be handled in the order in which they are received.

ORGANIZATION

Fraunhofer Institute for Manufacturing Engineering and
Automation IPA

WORKSHOP FEE

Participation to this workshop is free of charge.

CHANGE OF REGISTRATION

A change of registration to another participant is possible. Please inform the us about the alternate participant. This service is possible at any time and free of charge.

VENUE

Fraunhofer Institute for
Manufacturing Engineering and Automation IPA
Nobelstrasse 12 | 70569 Stuttgart | Germany
Room: Hörsaal A/B
<http://www.ipa.fraunhofer.de/en/howtoeachus.html>