



The European Coordination Hub for Open Robotics Development

ECHORD++ Review Meeting WP6 Reporting Period 4

Prof. Alberto Sanfeliu

Luxembourg, February 22th 2018



Bristol Robotics Laboratory



Structured Dialogue and Outreach

Leader: UPC (32PM)

Other partners: TUM (12,5PM), SSSA (5,5PM), UWE(5,5PM), CEA(5,5PM), RU ROBOTS (2,5PM)

Total: 63,5PM

First month: M1 - Last month: M60

Tasks:

T6.2 Represent E++ at workshops, conferences, etc. (M3-M60)

Partners: **all**

T6.3 Organization of major fairs and events (M6-M60)

Partners: **all**

T6.4 R&D publications (M18-M60)

Partners: **all**

Deliverables

D6.2.1 1st Annual White paper on the structured dialogue (revised)

D6.2.3 3rd Annual White paper on the structured dialogue

Dissemination outcomes of WP6 Dec. 2016- Nov. 2017

The fourth reporting period has carried out a big number of actions in terms of dissemination including the Echord++ **instruments and its procedures**



The E++ partners have participated in international conferences, fairs and workshops, showing Echord++ as a whole and at the same time organizing **specific activities** for each one of the scenarios proposed in E++ looking to arrive to **specific target audiences**.

Dissemination outcomes of WP6 Dec. 2016- Nov. 2017

- **14 prototypes has been shown** at international trade fairs:
 - Global Robot Expo (Madrid, February)
 - Hannover Messe (Hannover, April)
 - Innorobo (Paris, May)
 - Smart City World Congress (Barcelona, November).
- **2 International Workshops** were organized at
 - EuRobotics Forum (Edinburgh, March). Agri-food
 - Smart City World Congress. “Encouraging cities to innovate through robotics”. City Open Consultation
- **Presentations** explaining the scientific/technological outcomes and the innovative solutions developed through the Echord++ project at:
 - Global Robot Congress,
 - EC Committee of Regions (Brussels, May) ,
 - FIABCI (Andorra, May),
 - Smart City world Congress and
 - Eurobotics week (Brussels, November).

Dissemination outcomes of WP6 Dec. 2016- Nov. 2017

- **Open workshop for general public and end users**
“Festa de la Ciencia” (Barcelona, June)



Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (1)

2017				
EVENT	VENUE	DATE	ORG	DETAILS
Global Robot Expo	Madrid, Spain	February 2 nd – 4 th	UPC	Echord++ Stand. 4 prototypes. Audience: 200. Presentation by Prof. A. Sanfeliu. Audience: 70
European Robotics Forum 2017	Edinburgh, Scotland, UK	March, 22 nd – 24 th	SSSA, UPC, CEA	Workshop: Robotics for Agri-Food: Echord++ Experience. Audience: 60
Hannover Messe'17	Hannover, Germany	April 25 th – 28 th	UPC - TUM	Echord++ Stand. 4 prototypes. Audience: 200
EC Committee of Regions	Brussels, Belgium	May, 10 th	UPC	Echord++ booth and PDTI Presentation. Prof. A. Sanfeliu. Audience: 120
Innorobo 2017	Paris, France	May 15 th – 19 th	UPC - CEA	Echord++ Stand. 4 prototypes. Audience: 200

Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (2)

2017				
EVENT	VENUE	DATE	ORG	DETAILS
Festa de la Ciencia	Barcelona, Spain	May 27 th	UPC	Urban Robotics Workshop. UPC Team. Audience: 30
Robotics Festival	Pisa, Italy	Sept. 7 th -13 th , 2017	SSSA, TUM	Press-tour, workshops
IROS 2017	Vancouver, Canada	September 25 th -28 th	UPC	Preparation of Echord++ Final Event at IROS 2018. Activities and sponsoring
SMART CITY WORLD CONGRESS & EXPO 2017	Barcelona, Spain	November 14 th – 16 th	UPC	Echord++ STAND. “Encouraging cities to innovate through robotics”. Audience: 200 Presentation at the SCWC’ 17 PANEL: “Age-friendly cities and communities” Prof. A. Sanfeliu. Audience 100 Cities Open Consultation at the AGORA space. UPC Team. Audience 50
Eurobotics Week	Brussels, Belgium	November 20 th , 2017	UPC, BOR	Echord++ Booth. Audience: 30

Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (3)

Networking and dissemination

- RIF@Paris-Saclay upkeep and develops links with French regions
- RIF model interesting for other organizations in Metz, Nantes, Bordeaux, Lille and Toulouse

Connections with technological platforms dedicated to manufacturing

- **Factory-Lab** in Ile-de-France region (inaugurated in October 2016)
 - Cofounded with: ACTEMIUM, PSA, DCNS, SAFRAN, Dassault, CETIM, Arts&Métier
- **FFLOR** in east of France (inaugurated on the 31st of January 2017) are meant to facilitate take up of ICT (including robotics) on the production lines.
 - Cofounded with: PSA and Grand Est region

Factory-Lab
Inaugurated
Oct 2016



FELOR
Inaugurated
Jan 2017

Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (4)

Global Robot Expo	Madrid, Spain	February 2nd – 4th , 2017	UPC	Echord++ Stand. 4 prototypes. Presentation at the Global Robot Expo Conference by Prof. A. Sanfeliu
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Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (5)

Hannover Messe'17	Hannover, Germany	April 25 th – 28 th , 2017	UPC - TUM	Echord++ Stand. 4 prototypes
				

Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (6)

EC Committee of Regions	Brussels, Belgium	May, 10 th	UPC	Echord++ booth and PDTI Presentation. Prof. A. Sanfeliu. Audience: 120
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Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (7)

Innorobo 2017	Paris, France	May 15 th – 19 th , 2017	UPC - CEA	Echord++ Stand. 4 prototypes
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Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (8)

Festa de la Ciència	Barcelona, Spain	May 27 th , 2017	UPC	Urban Robotics Workshop. UPC Team
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3. LA REVOLUCIÓ TECNOLÒGICA
 És difícil imaginar una vida sense internet ni telèfons mòbils, però l'evolució actual no és per canviar-los sinó per aprofitar-los. Més enllà de la pura tecnologia, la robòtica i la intel·ligència artificial són les eines que transformaran el nostre món a l'entorn del dia.

CONSTRUÏMOS UN DRON
 Taller, +12 anys
 A càrrec de Lluís Rueda i Patricia Chens, Familiar DIT
 Dissabte, 11 h. Durada 2 hores
 20 places, cal inscripció al web

ROBOTS A LA CIUTAT, QUÈ EN PENSEM?
 Taller, per a totes les edats
 A càrrec d'Àlex Gamet i Víctor Vilas, Institut de Robòtica i Informàtica Industrial (IRI-UPC)
 Dissabte, 11.15, 13.45 i 16.15 h.

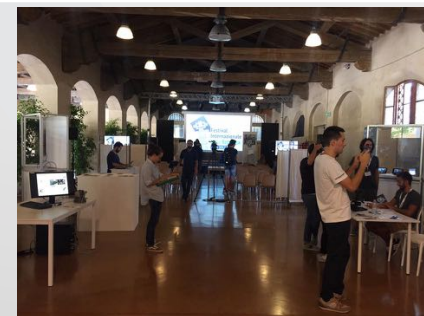
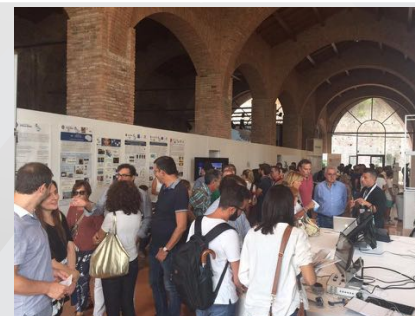


INTERNATIONAL ROBOTICS FESTIVAL

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (9)

Robotics Festival	Pisa, Italy	September 7 th -13 th 2017	SSSA, TUM	Press-tour, workshops
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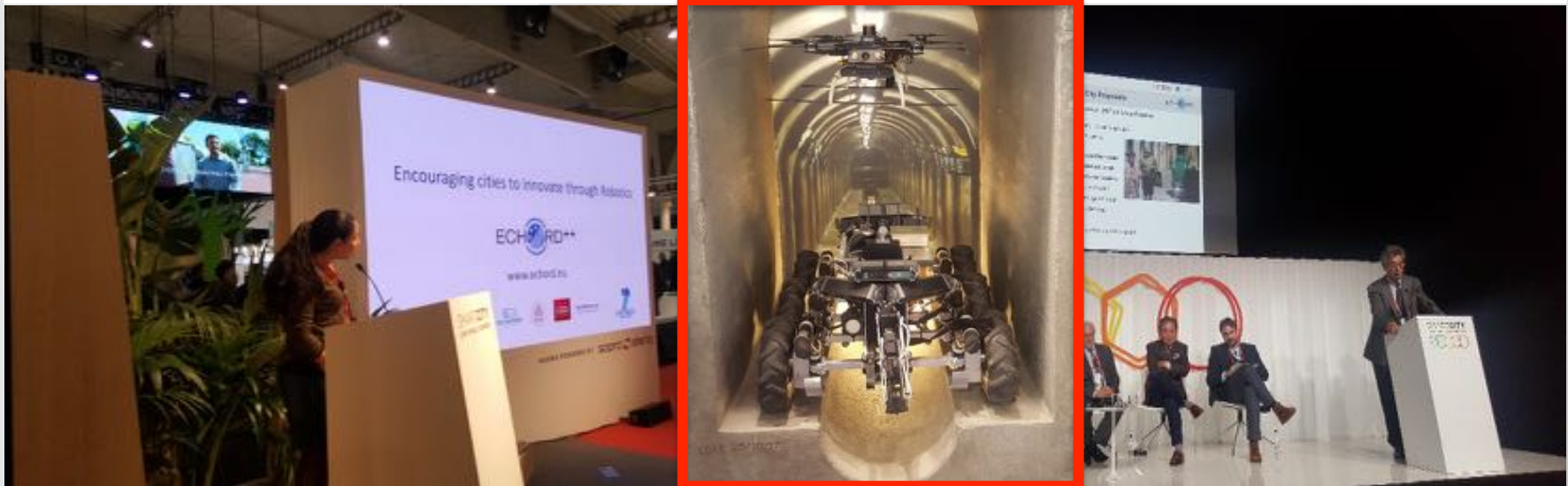
Exhibitions, events, conferences, concerts and much more!



Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (10)

SMART CITY WORLD CONGRESS & EXPO 2017	Barcelona, Spain	November 14 th – 16 th	UPC	Echord++ STAND. “Encouraging cities to innovate through robotics “ Presentation at the SCWC’ 17 PANEL: “Age-friendly cities and communities” Prof. A. Sanfeliu Cities Open Consultation at the AGORA space. UPC Team
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Overview of tasks for WP 6

T6.2. Representation E++ at workshops, conferences & T6.3 Organization of major fairs and events (11)

ECHORD++. WP6. DISSEMINATION ACTIVITIES 2018						
WP6 Organization of workshops, conferences, major fairs and events	EUROPEAN ROBOTICS FORUM WORKSHOP	AUTOMATICA STAND		IROS BOOTH WORKSHOP FINAL EVENT	MEDICA STAND	SMART CITY WORLD CONGRESS STAND & WORKSHOP
	1- "Encouraging Regions to Innovate through Robotics" 2- "EU Projects offering services: don't miss it!" 3- "From Technology Transfer Initiatives To Digital Innovation Hubs"	STAND + SYSTEM INTEGRATORS ACTIVITY	FESTA DE LA CIENCIA VENTURE FEST	ACADEMY ACTIVITY	STAND + SYSTEM INTEGRATORS ACTIVITY	STAND + CITIES ACTIVITY
	Tampere, FINLAND March 13th-15th	Munich, GERMANY June 19th-22nd	JUNE / JULY / AUGUST	Madrid, SPAIN October 1st-5th	Dusseldorf, GERMANY November 12-15th	Barcelona, SPAIN

Task 6.4: R&D Publications and project outcomes

1st Annual White paper on the structured dialogue.

PDTI Procedure

2nd Annual White paper on the structured dialogue

PDTI Healthcare

3rd Annual White paper on the structured dialogue

EXPERIMENTS

4th Annual White Paper

RIFs

Task 6.4: R&D Publications and project outcomes

Scientific Book

Echord++ Project Scientific Results

Echord++ Final Brochure

Industry & General public-orientated publication

Task 6.4: R&D Publications and project outcomes

Scientific Book

TITLE: Advances in Robotics Research: from Lab to Market

SUBTITLE: Echord++: Robotic Science Supporting Innovation

EDITOR: Springer Track in Advanced Robotics series

WORKING TEAM

Antoni Grau, UPC - Yannick Morel, TUM - Francesca Cecchi, SSSA - Ana Puig-Pey, UPC

OBJECTIVE: Summarize the lessons learned in ECHORD++ project, the procedures of the three E++ instruments - Experiments (EXP), Robotic Infrastructure Facilities (RIF) and Public end-users Driven Technological Innovation (PDTI) - and collect several scientific articles of the robotic prototypes developed under the ECHORD++ project.

Task 6.4: R&D Publications and project outcomes

Scientific Book

PART I: ECHORD++ Instruments

1. The ECHORD++ project: A general overview (5 pages) TUM
2. Experiments EXPs (15pages) SSSA
3. Research Innovation Facilities RIFs (15pages) BRL
4. Public end-users Driving Technological Innovation PDTIs (15pages) UPC

PART II: ECHORD++ Application areas

5. Agri-food. 60 pages

MARS / 3DSSC / SAGA / GRAPE

6. Cognitive tools and workers. 60 pages

PICKIT / WIRES / SAFERUN / FASTKIT

7. General purpose robotic co-workers. 45 pages

MODUL / HyQ-REAL / SAPARO

8. Medical and rehabilitation robotics. 60 pages

EXOtrainer / Keraal / MOTORE++ / ASSESTRONIC

9. Urban Robotics. 30 pages

ARSI / SIAR

Task 6.4: R&D Publications and project outcomes

Scientific articles

- M. Hutter, C. Gehring, A. Lauber, F. Gunther, C. D. Bellicoso, V. Tsounis, P. Fankhauser, R. Diethelm, S. Bachmann, M. Bloesch, H. Kolvenbach, M. Bjelonic, L. Isler, and K. Meyer. ANYmal - toward legged robots for harsh environments. *Advanced Robotics*, 31(17):918–931, sep 2017b
- M. Hutter, R. Diethelm, S. Bachmann, P. Fankhauser, C. Gehring, V. Tsounis, A. Lauber, F. Guenther, M. Bjelonic, L. Isler, H. Kolvenbach, K. Meyer, and M. Hoepflinger. Towards a Generic Solution for Inspection of Industrial Sites. In *Field and Service Robots (FSR)*, 2017a
- M. Hutter, C. Gehring, D. Jud, A. Lauber, C. D. Bellicoso, V. Tsounis, J. Hwangbo, K. Bodie, P. Fankhauser, M. Bloesch, R. Diethelm, S. Bachmann, A. Melzer, and M. Hoepflinger. ANYmal - a highly mobile and dynamic quadrupedal robot. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 38–44, oct 2016c
- K. Bodie, C. D. Bellicoso, and M. Hutter. ANYpulator: Design and Control of a Safe Robotic Arm. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)*, pages 1119–1125, 2016
- F. Basso, E. Menegatti, A. Pretto. Robust Intrinsic and Extrinsic Calibration of RGB-D Cameras
- M. Imperoli, A. Pretto. Active Detection and Localization of Textureless Objects in Cluttered Environments
- C. Guarino Lo Bianco. I veicolo a guida autonoma
- M. Raineri, S. Perri, and C. Guarino Lo Bianco. Online velocity planner for Laser Guided Vehicles subject to safety constraints
- D. Albani, O. D. Nardi and V. Trianni. Field Coverage and Weed Mapping by UAV Swarms
- D. Albani, J. Ijsselmuiden, R. Haken and V. Trianni. Monitoring and Mapping with Robot Swarms for Agricultural Applications

Conclusions

- The ECHORD++ brand has a very strong value.
- ECHORD++ has been disseminating its activities in top international trade fairs, European public forums, scientific conferences, workshops, and in the Europe Robotics Forum
- It has reached citizens, professionals, SME and big companies, academics, students and politicians
- In 2018 ECHORD++ will be in the top trade fairs of industry, healthcare, smart cities and scientific conferences

Thanks
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