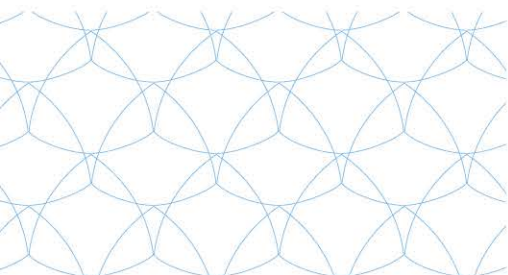


Deliverable D2.3

Nine-month report on the progress of know-how exchange 3

Project Acronym:	EXCELLABUST	
Grant Agreement number:	691980	
Project title:	Excelling LABUST in marine robotics	
Funding:	Horizon2020 Twinning	
Call:	H2020-TWINN-2015	
Type of action:	CSA	
Start date of project:	1 st January 2016	
Duration:	36 months	
Project website:	http://excellabust.fer.hr/	
Delivery date:	31/03/2018	
Version:	1.0	
Lead participant	UNIVERSITY OF GIRONA	
Dissemination level:		
PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691980.



DELIVERABLE DATA SHEET

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Deliverable number:	D2.3		
Deliverable title:	Nine-month report on the progress of know-how exchange 3		
Work package:	WP2 – Know-how exchange		
Type:	Delivery date	31/03/2018	Version: 1.0
Lead participant	University of Girona (UdG)		
Dissemination level:			
PU	Public		X
CO	Confidential, only for members of the consortium (including the Commission Services)		

Version log			
Revision no.	Date	Author (Partner)	Change
1	31/03/18	UdG	-

Deliverable summary
<p>EXCELLABUST project has, as one of its main goals, the increase of UNIZG-FER marine robotics scientific excellence and innovation capacity, and raise staff's research profile within the three scientific strategic domains: 1) mapping and perception, 2) advanced NGC, and 3) autonomy and cognition, by implementing strategic measures in the form of staff exchanges, invited talks, on-site trainings and innovation management trainings.</p> <p>This deliverable covers the activity done within the consortium framework along M19-M27 of the project, from July 2017 to March 2018.</p>



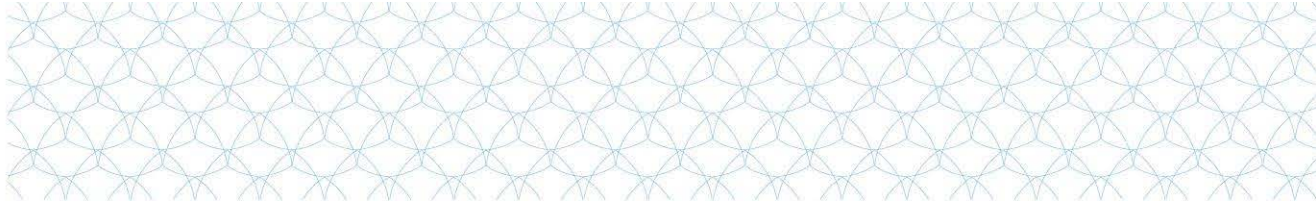
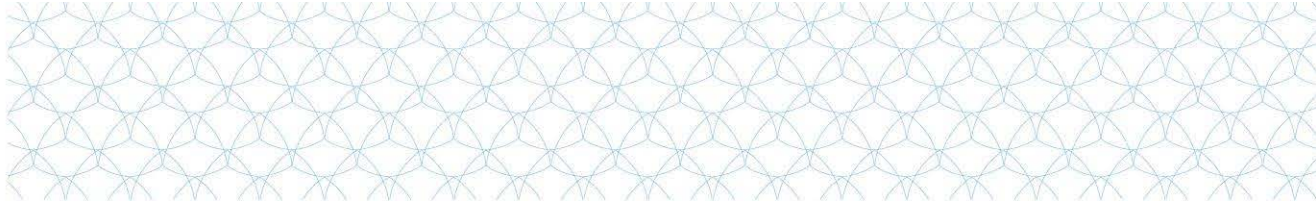


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2. SHORT-TERM TRAININGS
3. INNOVATION MANAGEMENT TRAININGS
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INTRODUCTION

This WP is directly linked to EXCELLABUST **Objective 1: “Increase excellence and innovation capacity”**, specifically:

Increase UNIZG-FER marine robotics scientific excellence and innovation capacity, and raise staff's research profile within the three scientific strategic domains: 1) mapping and perception, 2) advanced NGC, and 3) autonomy and cognition, by implementing strategic measures in the form of staff exchanges, on-site trainings and innovation management trainings that will:

Ensure S&T knowledge transfer from internationally leading partners to UNIZG-FER (staff exchanges and expert visits),

Provide hands-on S&T experience by internationally-leading partners (on-site trainings), and

Provide knowledge on innovation management to all involved research institutions (innovation management training)

WP2 objectives will be achieved through the following main activities:

1. Short-term staff exchanges

LABUST staff members visit each partner institution on two occasions, in the duration of 2 months, resulting in a total of 12 months of staff exchanges. Host institutions provide all the administrative assistance for the guest staff members. Researchers at host institutions supervise the guest staff progress and provide them with all the assistance required to ensure high quality know-how transfer. Research topics covered during the short-term staff exchanges are aligned with the defined strategic research domains in which the host institution has expertise. The outcome of these short-term staff exchanges result in joint journal and conference publications.

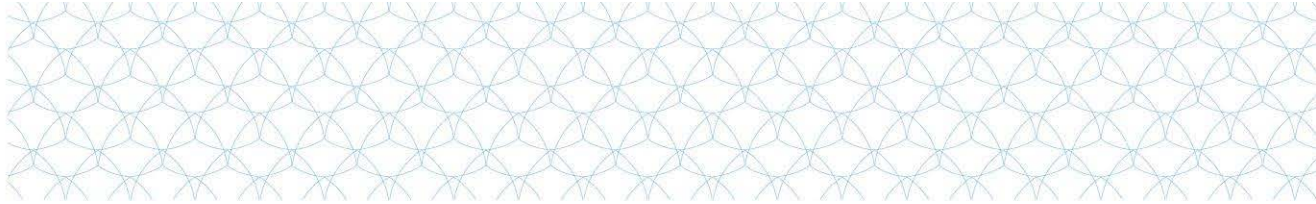
2. Short-term trainings

Each partner will organize one training at their institution along the project: CNR in year 1, UdG in year 2, and UL in year 3. During "Breaking the Surface" summer schools, all partners will organize training events that will include hands-on experience with real marine robotics equipment. Altogether, 12 trainings will be organized, four by each partner.

As a preparation for trainings, trainers will provide agendas and materials required for training events in a timely manner (at least 2 weeks before the training). Each trainer will provide infrastructure required for the execution of trainings. UNIZG-FER will provide the infrastructure for trainings at BtS while trainers will provide the training materials, and personnel and technology resources.

Research topics covered during the short-term trainings will be aligned with the defined strategic research domains in which the host institution has expertise. Training events will be attended by staff





from all EXCELLABUST partners in order to increase cohesion between the groups and achieve more interaction and knowledge transfer during the trainings.

The outcome of this task will be transferred hands-on knowledge by trainers from internationally-leading partner institutions to all research staff members involved in EXCELLABUST twinning project.

3. Expert visits

Expert visits by each internationally leading partner to UNIZG-FER will be organized twice during the project lifetime. In addition to that, each internationally-leading partner institution will organize an expert visit each year during the BtS workshop. Altogether, this task includes preparation and execution of 15 expert visits to Croatia. Expert visitors will provide lecture materials which will be made public after the completion of the visit. Expert visits will be organized in a form of 2-3 day lecture series with theoretical topics that are aligned with the desired strategic research domains. Tentative titles of the lecture series are given in DoW.

The outcome of expert visits will be transfer of theoretical knowledge, through a series of lectures, in the topics defined by the strategic research domains.

4. Participation in innovation management trainings

This task will be devoted to participation in innovation management trainings which are required for efficient and high quality research management. These trainings are organized by professionals, either at partner institutions, or at third sites. Innovation management training will include topics such as proposal writing, project management and implementation, intellectual property protection, patent writing and application, etc. It is expected that young researchers with less innovation management will participate in these trainings. Within this task, research staff members from all EXCELLABUST consortium will participate.

The outcome of innovation management training will be increased level of knowledge in project management, innovation management and IPR issues.



1. Short-term staff exchanges

There are no Short-term staff exchanges for this period. They have been postponed to the final 9 months of the project.

2. Short-term Trainings

There are no Short-term training for this period. They have been postponed to the final 9 months of the project.

3. Expert Visits

3.1. Tutorials

3.1.1. Tutorial: [Tutorial by CNR team during Breaking the Surface 2017](#)

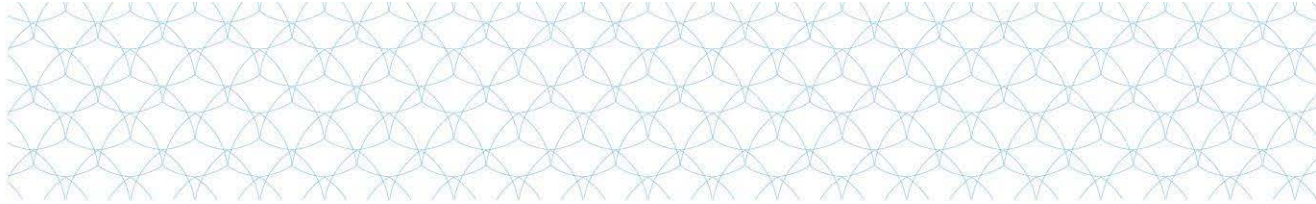


Marco Bibuli, Gabriele Bruzzone, Massimo Caccia, Angelo Odetti from [National Research Council of Italy \(IT\)](#) held a tutorial “POP ART (Portable Pelagic Autonomous Robotic Technology) concept & field demonstration” during the 2nd EXCELLABUST summer school which was organized as part of Breaking the Surface 2017. Breaking the Surface 2017 was held from 1st until 8th October in Biograd na Moru (Croatia) and more than 190 people participated in the program.

3.1.2. Tutorial: [Tutorial by Matija Rossi, UL during Breaking the Surface 2017](#)



Matija Rossi from University of Limerick (IE) held a tutorial “**Parallel Computing with CUDA made (almost) simple**” during the 2nd EXCELLABUST summer school which was organized as part of Breaking the Surface 2017. Breaking the Surface 2017 was held from **1st until 8th October in Biograd na Moru (Croatia)** and more than 190 people participated in the program.



3.1.3. Tutorial: Tutorial by UdG during Breaking the Surface 2017



Nuno Gracias and Ricard Campos from University of Girona (ES) held a tutorial “Omnidirectional vision for underwater robots” during the 2nd EXCELLABUST summer school which was organized as part of Breaking the Surface 2017. Breaking the Surface 2017 was held from 1st until 8th October in Biograd na Moru (Croatia) and more than 190 people participated in the program.

3.1.4. Tutorial: H2020 DexROV project: Teleoperation of a simulated ROV and arm by Gianluca Antonelli, ISME / University of Cassino

3.1.5. Tutorial: Underwater Camera Calibration with the Pinax model by Andreas Birk, Tomasz Łuczyński, Jacobs University Bremen, Robotics Group



3.2. Invited talks

3.2.1. Invited talk: "Distributed hybrid control of multi-agent systems under high level specifications"



The H2020 project "EXCELLABUST - Excelling LABUST in marine robotics", Centre of Excellence ACROSS CoE, Centre of Research Excellence DATACROSS and IEEE Croatia Section, Robotics and Automation Chapter organized the lecture: "Distributed hybrid control of multi-agent systems under high level specifications" given by Prof. Dimos V. Dimarogonas, *KTH Royal Institute of Technology*, Stockholm, Sweden.

The lecture took place on Tuesday, 19th December 2017, in Grey Hall at the Faculty of Electrical Engineering and Computing, Zagreb, Croatia.

3.2.2. Breaking the Surface (Summer School) - 19 Invited talks:

Marine robotics (MAROB):

1. **Marc Carreras**, Computer Vision and Robotics Institute of the Universitat de Girona (ViCOROB/UdG): *Towards persistent AUVs for seabed inspection*
2. **Jeremi Gancet**, Space Applications Services: *DexROV: 2017 trials results and perspectives*
3. **William Kirkwood**, Monterey Bay Aquarium Research Institute: *FOCE – Long Term In Situ Ocean Acidification Instrumentation*
4. **Nikola Mišković**, University of Zagreb Faculty of Electrical Engineering and Computing: *Human-robot interaction under water*
5. **Eduardo Silva**, INESC TEC / ISEP: *Localization and mapping in dynamic underwater environments*
6. **Kimon P. Valavanis**, University of Denver: *Navigation and Control of Unmanned Vehicles: A Fuzzy Logic Perspective*

Marine biology (MARBIO):

7. **Renee E. Bishop Pierce**, Pennsylvania State University: *Subterranean Groundwater Discharge and Marine Ecosystems*
8. **Draško Holcer**, Croatian Natural History Museum / Blue World Institute of Marine Research and Conservation: *Cetaceans and sea turtles of the Adriatic – the next step*
9. **Craig R. Smith**, University of Hawaii at Manoa: *Extreme seafloor ecology: use of ROVs and AUVs to evaluate biodiversity and ecosystem function in the world's most remote ecosystems*

Marine archaeology (MARCH):

10. **Guillermo de Anda**, Instituto Nacional de Antropología e Historia / National Geographic Society / Proyecto Gran Acuífero Maya: *The Great Maya Aquifer*
11. **Andreas Kallmeyer Bloch**, The Viking Ship Museum in Roskilde: *Technology, archaeology and student challenges Finding a best practice for presenting maritime archaeology*



12. **A.Harun Özdaş**, Dokuz Eylul University Institute of Marine Science and Technology: *Shipwrecks discovered along the western coast of Turkey*
13. **Irena Radić Rossi**, University of Zadar: *The Wonder of the Shipwreck of Gnalić*
14. **Augusto Salgado**, CINAVAL - Centro de Investigação Naval: *Contemporary Underwater Archaeology in Portugal. New challenges, new ideas*
15. **Kotaro Yamafune**, A.P.P.A.R.A.T.U.S. LLC & **Matko Čvrljak**, Roskilde Viking Ship Museum: *A Methodology for Accurate and Quick Photogrammetric Recording of Underwater Cultural Heritage*

Maritime security (MARSEC):

16. **Richard J. Nagle**, Naval Sea Systems Command/PMS-408; Navy EOD Program Support Senior Program Analyst, G2 Software Systems, Inc.: *Relevance of UMS for Below the Surface (BTS) Tasks*
17. **John Potter**, NATO STO Centre for Maritime Research and Experimentation (CMRE): *Ex Machina – Integrating maritime robots into human endeavours*

Maritime geology (MARGEO):

18. **Slobodan Miko**, Croatian Geological Survey: *Late Quaternary and Holocene Submerged Landscapes of the Eastern Adriatic Sea*
19. **Javier Escartin**, CNRS/IPGP: *Breaking the surface of the seafloor: Studying the traces of earthquakes underwater*



4. Innovation Management Trainings

4.1. Innovation Management Training 3: Martin Vendel held a lecture and workshop on technology transfer at UNIZG-FER



LABUST participated in lecture „KTH Royal Institute of Technology’s role in making Stockholm a global cluster for ICT“ and workshop „Turning research into business – Understanding the impact of technology“ given by **Dr. Martin Vendel**, KTH Stockholm, Sweden.

The lecture took place on Thursday, **15th March 2018** and the workshop took place on Friday, **16th March 2018** at **UNIZG-FER**. On both occasion, Dr. Martin Vendel talked about impact and importance of technology transfer.

4.2. LABUST team participated in the workshop “Fundamentals of the intellectual property for the researchers”



LABUST team participated in the workshop “*Fundamentals of the intellectual property for the researchers*” held in UNIZG-FER on the 28th March 2018. The workshop was organised and held by Mirjana Dozan, Head of the Office for Intellectual Property at UNIZG-FER, Igor Bošnjaković, Senior Adviser at State Intellectual Property Office and Associate Professor Dubravko Babić from UNIZG-FER. The goals of the workshop were to promote and stimulate scientific research, establish a procedure for identification, protection and commercialization of intellectual property and help researchers to track and record the intellectual property portfolio.

The workshop covered the following topics:

- Introduction to Intellectual property
- Intellectual property management
- Creating values of Intellectual property
- Patent registration
- Patent law

4.3. Nikola Mišković attended H2020 FET Innovation management training



Nikola Mišković attended **H2020 FET - Innovation management training** on 26th January 2018 at Research Executive Agency in Brussels, Belgium. The European Commission organised training for FET ILP project coordinators. As part of the workshop they attended both round tables on prospecting license opportunities and closing license deals and on valorization or commercialization-via bilateral collaborations with industry. In the bilateral meetings participants were conducting the Innovation Radar exercise and discussed on business coaching services and other European Innovation Council schemes. The project officers discussed aspects of the project's implementations and grant agreement.

4.4. Matej Celega participated at FET2RIN workshops

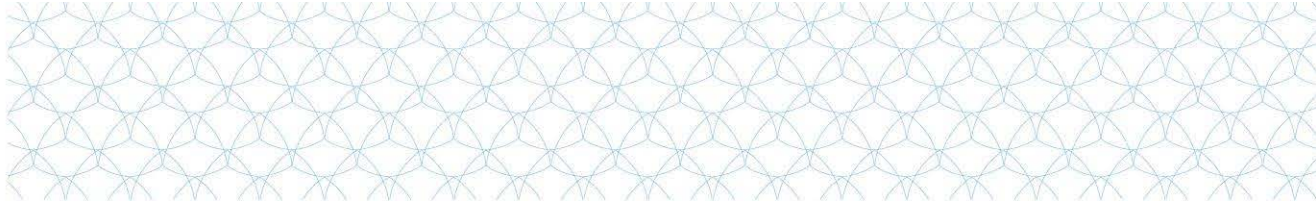


LABUST member **Matej Celega** participated at the 3rd edition of **FET2RIN training** which was organised in three workshops in Brussels, Belgium: 1st from 28 to 29 September 2017, 2nd from 26 to 27 October 2017 and 3rd workshop from 30 November to 1 December 2017. **FET2RIN** has organised the third round of training course for Future Emerging Technologies (FET) to help participants to access the market and make a larger impact on society. FET2RIN aims at helping FET projects by overcoming obstacles related to market outreach and

accessing business leaders including entrepreneurs, early stage investors and crowdfunding communities.

4.5. Innovation Tuesday at Breaking the Surface summer school (10 Innovation talks)

1. **Alex Alspach**, Toyota Research Institute: *Soft Sensing and Simulation*
2. **Marin Bek**, UNIZG FER / H2O Robotics: *Breaking the corporate*
3. **Fabio Bruno**, University of Calabria: *From research to business: some experiences at the University of Calabria*
4. **Thomas Curtin**, Applied Physics Laboratory, University of Washington: *The Scaling of Innovation Tools*
5. **Cesare Fantuzzi**, University of Modena and Reggio Emilia: *Bridging the gap between academic research and commercially viable technology*
6. **Vladimir de Franceschi**, Founder Institute, Inc.: *Startup How To*



7. **Gerardo Morales-Hierro**, Triple Helix Venture Capital: *Financing of Early Stage Technology Startups*
8. **Vlatka Petrović**, University of Zagreb: *Paths to market – getting university innovation into the right hands*
9. **Tom Runge**, German Research Center for Artificial Intelligence DFKI, Robotics Innovation Center: *Rich & Famous with Underwater Robotics? Attempt of an objective assessment*
10. **Martina Schraudner**, Fraunhofer Center for Responsible Research and Innovation: *Uncovering the impact of the institutional environment on transfer activities*

