# FLAG-ERA II

## Deliverable D8.4

### JTC 2016 projects seminar 2 presentations

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| EC project officer | Jean-Marie Auger |
| Description of content | This deliverable documents the JTC 2016 2nd project seminar (follow up seminar). |
| Publishable abstract | The deliverable consists of the agenda and presentations of the JTC 2016 follow up project seminar. |
| Keywords | JTC 2016, follow-up, monitoring |
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1 Introduction

The present deliverable is in the framework of WP8, in particular task 8.2 “Follow-up seminar organisation”. This task covers the organisation of three yearly JTC 2016 projects seminars, where the four projects funded in the framework of JTC 2016 (Convergence, FuturICT 2.0, ITFoC, Robocom++) present their goals and achievements to the research community and FLAG-ERA II representatives.

A JTC 2016 follow-up project seminar was organised in Madrid on March 22, 2018. At this occasion, all the four JTC 2016 projects were participating and could present their results and network. In addition, representatives of the CSA TAIPI and of the HBP Flagship were also taking part to this event and shared their vision of managing large consortia and were part of the discussions. A total of 23 participants attended the kick-off seminar (7 of them were project representatives). The agenda of the FLAG-ERA JTC 2016 project follow up seminar is reported in Annex1 of the present document. In the Annex2 the introductory and final presentations of the session by MIUR and an extract of the four JTC 2016 projects follow up presentations are reported.

A next follow-up seminar is being announced and will be held in February 2020 in Rome, Italy.
Annex 1 - JTC 2016 Project Follow up Seminar

Flag-ERA JTC 2016 Project Seminar

Agenda

Ministerio de Economía, Industria y Competitividad

Paseo de la Castellana 162

28046 Madrid, Spain

Room F (Sala “F”)

Thursday 22 March 2018

Seminar objectives:

- Monitor the progress of the projects in the context of the preparation of new Flagships
- Exchange views on the Flagship model

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<tbody>
<tr>
<td>13:30</td>
<td>1h00</td>
<td>Lunch and welcome</td>
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<td>FLAG-ERA JTC 2016 stakeholders</td>
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<tr>
<td>14:30</td>
<td>0h20</td>
<td>Introduction</td>
<td>MIUR</td>
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<tr>
<td>14:50</td>
<td>0h40</td>
<td>Feedback on the Flagship experience</td>
<td>HBP</td>
<td>TAIPI</td>
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<tr>
<td>15:30</td>
<td>1h00</td>
<td>Project presentations</td>
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<td>Coffee break</td>
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<tr>
<td>17:00</td>
<td>1h00</td>
<td>Project presentations (continued)</td>
<td>Convergence</td>
<td>FuturICT 2.0</td>
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<td>18:00</td>
<td>0h30</td>
<td>General discussion and next steps</td>
<td>ANR</td>
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<tr>
<td>18:30</td>
<td></td>
<td>End of JTC 2016 project follow-up seminar</td>
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Annex 2 - JTC 2016 Project Follow up Seminar presentations
FLAG-ERA

JTC 2016 Project Seminar

Introduction to the seminar: Objectives and updates on the FET Flagship model

Eugenio Guglielmelli and Giorgio Carpino

*Italian Ministry of Education, Universities and Research (MIUR)*

MINECO - Madrid

March 22, 2018
JTC 2016 Project Seminar - Objectives

1. Update on FET Flagship and related ERANET Programmes
2. Exchange views and lessons learned from ongoing Flagship and Flagship-related Programs
3. **Monitor the progress of the projects with respect to the original goals and workplans**
4. Monitor the evolution of the projects in the context of the preparation of new Flagship CSA\Pilots
# JTC 2016 Project Seminar - Agenda

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<td>Edouard Geoffrois (ANR), Eugenio Guglielmelli (MIUR)</td>
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<td>0h40</td>
<td><strong>Feedback on the Flagship experience</strong>&lt;br&gt;• The HBP experience: Unifying vision, organisation, synergies with partnering projects, achievements and perspectives&lt;br&gt;• Setting up key performance indicators for large programmes</td>
<td>Martin Telefont (HBP), Florian Knecht (TAIPI)</td>
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<td>Paolo Dario, Nora Benhabiles</td>
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<td><em>End of JTC 2016 project follow-up seminar</em></td>
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Joint Transnational Call 2016

for Flagship Proof-of-Concept Projects on

ICT for Social Sciences,
High-Efficiency Sensor Networks,
Digital Medicine for Cancer,
and Cooperative Robots
JTC 2016 on the topics of the 4 Pilots: objectives

• To build on the efforts of the 4 non-selected Flagship Pilots
  • Cooperative Robots (building on RoboCom)
  • Digital Medicine for Cancer (building on ITFoM)
  • High-Efficiency Sensor Networks (building on Guardian Angels)
  • ICT for Social Sciences (building on FuturICT)

• For each of the 4 topics, support one “Flagship-proof-of-concept” project showing, through the implementation of selected activities, how the possibilities offered by the Flagship model can bring added value

• Consolidate research networks
• Match National NRFO priorities
• Nurturing new large-scale projects
• Exploiting existing research roadmaps
Expected profile of the JTC 2016 projects

- Exploit the **potential of the original pilot initiative** (vision, research roadmap, network)
- **Excellent quality** of the scientific content and implementation work plan for Flagship proof-of-concept research activities
- Provide a solid and convincing **Flagship-like approach** for federating other ongoing research initiatives and foster coordination and networking of the research community
- Aim at making available **new methods, infrastructures, evaluation metrics, benchmarking** and other tools for joint research
- Include in the consortium **qualified partners** from each of the countries directly supporting the JTC 2016
- Leverage a **critical mass** of additional resources and partners from other EU and non-EU countries
JTC 2016 on the topics of the 4 Pilots: Timeline

- 9 funding countries
- Indicative budget: 14.5 M€
- Funded projects: 4
- Duration: 36 months (2017-2020)

Timeline

- Launched on January 22, 2016
- Submission deadline: March 31, 2016
- Submission of revised proposals: September 26, 2016
- End of negotiation phase: October, 2016
- Kick-off meeting of the 4 projects: Riga, FLAG-ERA II Project Workshop 1, April 28, 2017
- JTC 2016 1st Project Seminar: Madrid, FLAG-ERA II Project Seminar 4, March 22, 2018
# JTC 2016 selected projects

<table>
<thead>
<tr>
<th>Topic</th>
<th>Acronym and title</th>
<th>Coordinator</th>
<th>Countries in partnership*</th>
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</thead>
<tbody>
<tr>
<td>Cooperative Robots</td>
<td><strong>RoboCom++</strong>: Rethinking Robotics for the Robot Companion of the future</td>
<td>Paolo DARIO</td>
<td>IT, BE, CH, HR, CZ, EE, ES, FR, GR, IL, LV, NL, RO, SK, UK, TR</td>
</tr>
<tr>
<td>Digital Medicine for Cancer</td>
<td><strong>ITFoC</strong>: Information Technology: Future of Cancer Treatment</td>
<td>Nora BENHABILES</td>
<td>FR, DE, IT, LV, RO, TR</td>
</tr>
<tr>
<td>High-Efficiency Sensor Networks</td>
<td><strong>CONVERGENCE</strong>: Frictionless Energy Efficient Convergent Wearables For Healthcare and Lifestyle Applications</td>
<td>Adrian IONESCU</td>
<td>CH, BE, EE, FR, IT, LV, TR</td>
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<td>ICT for Social Sciences</td>
<td><strong>FuturICT 2.0</strong>: Large scale experiments and simulations for the second generation of FuturICT</td>
<td>Mario PAOLUCCI</td>
<td>IT, CH, EE, FR, BE, LV, RO</td>
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Two coordinators (bold) changed w.r.t. the 4 non-selected Pilots
Potential new Flagships in FP9

- New FET Flagships were considered to be launched in the context FP9
- Open public consultation
  - 24 ideas for new Flagships were proposed
- Three main areas identified (contributions from MS with Position Papers):
  - **ICT for connected society**
    - Smart Materials and Nanoscale Engineering
    - Robotics, Interfaces and Artificial Intelligence
    - ICT for Social Interaction and Culture
  - **Health and life science**
    - Disruptive technologies to Revolutionise Healthcare
    - Understanding Life by Exploring the Genome and the Cell
  - **Environment, climate and energy**
    - Earth, Climate Change and Natural Resources
    - Radically new Energy Production, Conversion and Storage devices and systems
- Objective to select for funding 3 to 6 preparatory actions
  - Potentially leading to up to 1-2 new Flagships in FP9
  - 1st stage: 33 proposal submitted by February 20, 2018
  - 2nd stage: deadline September 18, 2018
Timeline for new FET-Flagships

Horizon 2020

- Identifying topics (2016 – 2017)
- Preparing 4 to 6 Candidate Flagships (2018-2020)

Next Framework Programme

- Launching 1 or 2 new Flagships? (2021 - 2027)

Open Consultation 24 ideas
- Consultation Round-table Commissioner GH Oettinger
- FET WP 18-20 Call for preparatory actions

2nd stage

WP preparation | WP 18-20 Execution

2016 | 2017 | 2018 | 2019 | 2020
Elements to be considered for the candidate Flagships

• **A consolidated vision** based on a well-defined unifying goal articulated in terms of S&T objectives and of its targeted impact on economy and society.

• **A strategic long-term research roadmap**, showing how the unifying goal can be realised and what the major milestones are, situating the Flagship in the global landscape and demonstrating a credible path towards societal impact, technology development, innovation and exploitation.

• **A blueprint for the Flagship's implementation** setting out the overall collaboration and S&T framework, the identification of necessary competencies and resources including infrastructure aspects, and openness of the initiative.

• **An effective scientific leadership and governance structure** based on lessons learned from the present Flagships, describing the coordination and decision-making structures of the Flagship, the role of industry and the relations with Member States and countries associated with Horizon 2020, with the Commission and with the relevant funding agencies and national research initiatives.

• **Support from and involvement of industry**, giving a view on avenues for exploitation and further strengthening of European industry in the global landscape, including stimulating the emergence and growth of innovative value chains.

• **An approach to address responsible research and innovation**, in particular aspects such as education, gender aspects and societal, ethical and legal implications.
Lessons learned - References

October 2016 «FET Flagships - Lessons learned from the first 30 months of their operation»

[Link]

February 2017

[Link]

January 2017

[Link]

February 2018

[Link]
FET Flagships Interim Evaluation – February 2017

Recommendations for existing Flagships

1. Strategic relevance of the flagship instrument in setting and implementing the European strategy for research and innovation
2. Increase clarity of purpose and differentiation between the flagships and other research instruments
3. Establish a standard means of assessing the flagships based on key performance indicators that fully reflect purpose
4. Improve operational management to enhance the budget flexibility and reduce administrative overhead
5. Improve strategic management to enhance openness of the flagships towards adopting new directions
6. Improve coherence with other Horizon 2020 activities
7. Improve the process of selecting flagships
8. Improve engagement with National initiatives
Report on Future FET Flagships by FET Advisory Group

Recommendations for future Flagships

1. A FET FLAGSHIP should be a **mega transformational program**, with relevance to societal needs, based on academic excellence and Industrial capacity, with the potential to increase European competitiveness, for the benefit of the general public and the Member States.

2. Each Flagship should be aligned with the KET and involve the fastest ICT-based components, namely: Big Data, Robotics and AI, and new materials based components.

3. During the duration of a Flagship Program, **transparency** will be upheld regarding the process, the development and growth, and above all the tangible results emerging from the program.

4. A FET FLAGSHIP focusing on the future and emerging technologies, should be **multidisciplinary and interdisciplinary around its main S&T goal**, but should involve researchers and scholars from the SSH area, to address the societal view point.
The need to integrate the Social Sciences and Humanities with Science and Engineering*

How could the social sciences and humanities contribute more to Europe’s global competitiveness, so that science and technology developments fulfil their primary purpose, which should be serving humanity and sustaining the environment?

1. Opening up new policy questions and identifying new societal needs.
2. Developing and promulgating new social ‘technologies’ and defining a more holistic approach to technology governance.
3. Proactively critiquing current technologies and structures.
5. Developing a reflection on institutional design.
6. Integration of innovative perspectives from the arts and humanities into technological research.
7. Improving the usability and attractiveness of technologies.

*FET Advisory Group, December 2016
Report of Prof. Mariana Mazzucato

- Missions: Big science deployed to meet big problems
- A mission should have societal relevance. Societal challenges are complex. More complex than going to the moon, which was mainly a technical feat.
- A well-designed mission need to combine understandings of sociology, politics, economics and technology to solve these problems.
- Missions are serendipitous, non-linear and very high risk.
- Granularity in a clear logical framework is a key success factor: general mission objectives should be clearly linked to specific objectives of sub-projects.
- Portfolio approach based on different solutions and a broad range of different interactions: cross-disciplinary academic work, with strong focus at the intersection of natural sciences, formal sciences, social sciences and humanities, collaborations among different industries, etc.
- Using the entire research and innovation value chain, from fundamental research to applied research and cutting-edge innovation.
- What most advanced start-ups are doing and how they can support a given mission.
“Their high ambition and significant public EU research investment have crowded-in industry partners and mobilised private investment. Based on these characteristics, FET Flagships show a high degree of alignment with EU research and innovation missions as described in this report.

However, the FET Flagships have not so far put the same emphasis on public engagement or on defining goals and milestones in terms of societal relevance, even though they do aim to turn scientific and technological developments into innovations that can be brought to market, and aim to support societal challenges. The experience from the current FET flagships should prove valuable for designing and implementing future missions, and applying the selection criteria, implementation requirements and public engagement criterion proposed here could increase the impact and visibility of FET flagships as future missions.”
The report suggests the following 5 criteria for selecting EU-missions. They must:
• Be bold and inspirational, with wide societal relevance
• Be ambitious, but with realistic research & innovation actions
• Foster cross-disciplinary, cross-sectoral and cross-actor innovation
• Set a clear direction: targeted, measureable and time-bound
• Require multiple, bottom-up solutions
A CLEAR DIRECTION: TARGETED, MEASURABLE AND TIME-BOUND

Target is to reduce by 50% the progression of the disease in affected patients in 10 years. This would represent a saving of €92 billion in anticipated healthcare. Intermediate milestones like the number of patients presenting an earlier clinical status of dementia and the average age at which dementia is diagnosed could be defined.

From the Report by Prof. Mariana Mazzucato
Monitor the progress of the JTC 2016 projects in the context of the preparation of new Flagships

• Project Periodic Reports sent by the 4 JTC 2016 projects, Project Deliverables – available? To be double checked

• Presentation of the projects progress, in the following order:
  • Robocom++
  • ITFoC
  • Convergence
  • FuturICT 2.0

• The report will be reviewed by external experts and the feedback will be sent to the JTC 2016 Coordinators by May 2018.
# JTC 2016 Project Seminar - Agenda

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Discussion issues

• Comments/suggestions from the JTC2016 funding agencies
• Major deviations from the initial workplan? Contingency plans?
• Level of coherence with the (evolving) flagship model
• ......
• AOB
FRICTIONLESS ENERGY EFFICIENT CONVERGENT WEARABLES FOR HEALTHCARE AND LIFESTYLE APPLICATIONS – Progress Year 1

LUCA SELMI, SAVERIO DEVITO, ELISE SAOUTIEFF, ADRIAN IONESCU
Energy efficient wearable platform:

- low power bio- and environmental sensors
- energy management
- wireless communication
- heterogeneous integration
- data transfer and analytics
- preventive life-style and healthcare applications
CONCEPT & GOALS (2)

Convergence of technologies into smart sensing systems driven by life-style and health care applications
CONSORTIUM

https://www.convergence-era.org/

1. EPFL – Ecole Polytechnique Fédérale Lausanne
2. IUNET – Consorzio Nazionale Interuniversitario Per La Nanoelettronica
3. UCBM – Università Campus Bio-Medico di Roma
4. TAGLIAFERRI Srl
5. CEA – Commissariat à l’Energie Atomique
6. UCL – Université catholique de Louvain
7. IMT – National Institute for R&D Microtechnologies
8. HCC – Hirslanden Clinic Cecil
9. METU – Middle East Technical University
10. ETHZ – Eidgenössische Technische Hochschule Zürich
12. UNICA – Università degli Studi di Cagliari
14. ST – STMicroelectronics
15. EDI – Elektronikas un datorzinatnu instituts
16. UTBV – Universitatea Transilvania din Braşov
17. UTT – Tallinn University of Technology
Conclusions: Publications ad project valorization

Publications (9)
- 3 International peer reviewed journals
- 9 International peer reviewed conferences (1 joint)
- 3 National conferences (1 joint)

Patents (2)
- 2 patents on (UTT - Tallin): impedance analysis by digital excitation; quantization of response signal differences

Sessions and outreach (2)
- Special session at NEWCAS 2018 (Joint)
- CONVERGENCE mentioned in the «our story» section of the www.health-eu.eu proposal
Conclusions: deliverables, milestones and next steps

Deliverables

D1.1 Report on selection and benchmarking of internal and external low power sensors and their form factors and maturity: activity, sweat, breath and core body temperature [M12] – In progress

D3.1 M12 Report on power conversion circuits and assessment of performance. Specifications delivered to WP6. – Completed – In revision

D4.1 M12 Report on global architecture of transceiver and protocols – Draft version

D4.2 M12 Low power circuits for transceivers and power consumption strategy for communication – Draft version

D6.1 Communicating Testing platform for energy harvesters and sensors available –[M6] Done

D6.2 Test reports on first test platform with energy harvesters and sensors – [M12] In progress

D7.1 Requirements Definition Document for Wearable systems (include specific chapters with focus on Frailty, Cardiovascular diseases, Active life and Feedback) – [M6] Done

D8.1 CONVERGENCE Website and Press release - [M3] Website Done: running since Nov. 2017/ Press release delayed to 1st important scientific result

D8.2 Report on market analysis, benchmarking for wearable technologies in healthcare and life style for enhanced innovation in Europe – [M6] Completed - In revision

D8.3 CONVERGENCE Workshop 1: wearables for life style and wellbeing – [M12] Re-planned during ESSDERC/ESSSCIRC Sept 2018 within SINANO Workshop
Conclusions: deliverables, milestones and next steps

Milestones

**MM4 WP4** First implementation of low power circuits for transceivers and interoperable protocol for radio communication \([M12]\)

**MM7 WP7** Issuing of Wearable requirements \([M6]\) \(\rightarrow\) **achieved**

**MM6.1 WP6** Test platform for sensors and Energy harvesters available \([M6]\) \(\rightarrow\) **achieved**

**MM8 WP8** Convergence Workshop organized and resulting networking implemented \([M12]\) \(\rightarrow\) **planned for September 2018**
Health EU flagship (A. Ionescu)

https://www.health-eu.eu/

- A revolution with Health EU by leveraging data from omics, medical and imaging data, environmental and lifestyle big data continuously updated by a multitude of biosensors. With these complex data sets, first of their kind(s) human avatars will be built that can be personalised and used to prevent and cure each one’s own disease(s).

- Health EU will exploit most advanced organ-on-chip, smart nanosensor technologies and nanomedicine techniques.

- Health EU will boost European innovation and create disruptive advances related to big data analytics, smart micro/nano-systems, nanomedicine and new healthcare services and safer and more effective drugs.

- It will directly contribute to standards for privacy and security of healthcare data (Internet of Health care).

- Health EU FET Flagship will provide a truly sustainable approach to healthcare and a better Quality of Life to European citizens.
Health EU flagship

CSA proposal:
• 47 partners
• > 40 stakeholders
• > 65 supporters and partners for next phase
• strong national support
• major media reactions, follow-up, interviews, etc.
With Health EU, everyone will have an avatar to manage their health

Press release

In the future, will people have virtual twins to help them live longer, as Health EU is proposing. This major project, EPILE, is in the running to be a European Unic, and will receive €1 billion in funding over ten years.
Thanks for your attention
FLAG-ERA JTC 2016 RoboCom++ Project: Rethinking Robotics for the Robot Companion of the future

Paolo Dario
RoboCom++ Project Coordinator
The BioRobotics Institute, Scuola Superiore Sant’Anna, Pisa, Italy
FLAG-ERA JTC 2016 Project Seminar

http://robocomplusplus.eu
Outline

• Strategic Vision of the FLAG-ERA JTC 2016 RoboCom++ Project
• FLAG-ERA RoboCom++ Project: scientific and technological challenges and objectives
• Activities implemented and significant results
• The RoboCom++ Project: towards a Robotics Flagship
Outline

• Strategic Vision of the FLAG-ERA JTC 2016 RoboCom++ Project
  • FLAG-ERA RoboCom++ Project: scientific and technological challenges and objectives
  • Activities implemented and significant results
  • The RoboCom++ Project: towards a Robotics Flagship
The FLAG-ERA RoboCom++ FET FLAGSHIP Proof-of-concept Project (March 1, 2017 – February 28, 2020) will:

- Create the **Robot Companions COMMUNITY** (WP1)
- Prepare **Roadmaps on Strategic Research Topics** (WP3-RoboCom++ Research Pilot Projects and SEVEN Working Groups)
- Prepare the **Governance, Structuring and Financing of the Future Robotics Flagship**
- Explore **political aspects of the FET Flagship proposal**

The FET Flagship Pilot Action proposal on Robotics (‘Robotics Flagship’) was submitted on February 20, 2018!
The evolution of Robotics can be visualized as a series of “waves”:
The First “Wave” was a success story ESPECIALLY for EUROPE

First wave

Industrial Robotics

Methodologies and Technologies for Robotics and Mechatronics

Robotics body of knowledge


Joseph Engelberger, 1956
BY 1961, THE UNIMATE 1900 SERIES BECAME THE FIRST MASS PRODUCED ROBOTIC ARM FOR FACTORY AUTOMATION
The ‘Second Wave’: the consolidation of Industrial Robotics and the coming of SERVICE ROBOTS

The leadership of European research and industry consolidates, but aggressive new competitors emerge in Asia (Korea, China). The US still virtually absent, but their attention grows…

Aggressive actions by the EU in FP7 and especially INDUSTRY-DRIVEN in H2020
“[...] The size of the Robotics market is projected to grow substantially to 2020s. This is a global market and Europe’s traditional competitors are fully engaged in exploiting it. **Europe has a 32% share of the industrial market.** Growth in this market alone is estimated at 8%-9% per year. Predictions of up to **25% annual growth** are made for the service sector where **Europe holds a 63% share** of the non-military market. [...]”

“[...] From today’s €22bn worldwide revenues, Robotics industries are set to achieve annual sales of between €50bn and €62bn by 2020. [...]”

Robotics is one of the **12 disruptive technologies** identified by McKinsey (2015 Report)
The ‘Second Wave’ of Robotics is NOW!

Robotics Industry in Europe
(source: IFR Report 2017)

1.4 million industrial robots will be installed in the factories to increase productivity
333,000 service robots for professional use will be sold to non-manufacturing and to manufacturing sectors
42 million service robots for personal and domestic use (consumer robots) will be used in our private life
After the first and second robotics waves, a THIRD WAVE of big growth is coming for Robotics, based on continuous R&D and on new and disruptive science-based paradigms.
Europe is LEADER in Robotics Research!

Scientific Publications

Robotics Research in Europe
(source: Scopus, January 2018)

Publications in "robotics", last 5 years
Milestones of Robotics

1960 Birth of modern robotics

1970s Industrial Robotics

1980s Service Robotics and autonomous robots

1990s Bioinspiration and Humanoid Robotics

2010s Current challenges: Embodied (or ‘Physical’) Intelligence and Soft Robotics

The Robot Companion of the future
Are today’s robots ready for the bright future that industrial analysts predict? The answer is NO!

The MECHATRONIC bottleneck. Today, more functionality means:

- more complexity, energy, computation, cost
- less controllability, efficiency, robustness, safety
Editorial, December 2016

Science for Robotics and Robotics for Science

Paolo Dario, Editorial Board
Scuola Superiore Sant’Anna, Pisa, Italy

One of the ambitions of Science Robotics is to root robotics research deeply into science. Biorobotics represents such an ambition: It keeps the living world (and thus life sciences) at its core and investigates different applications of biomimetic machines and robots, as well as validates scientific hypotheses. The power of the latter is somewhat underestimated, but in fact it may represent what really makes robotics worthy of constituting a scientific and not only a technological or engineering pursuit. Robotics science can be pursued in two different ways: the first, according to the model of synthetic science, in which engineers create new knowledge (and thus science) by addressing and solving a series of problems; the second, by using robots to unveil natural principles. The latter approach has been pursued explicitly by some seminal papers in robotics that have appeared in the past 15 years.

In many cases, robots with advanced functionalities have been designed on the basis of new scientific principles observed independently. This is the case of climbing robots mimicking how geckos stably adhere to smooth vertical surfaces and roofs. The paper of Kim et al., published in 2008 in IEEE Transactions on Robotics, for example, grounds its roots in the scientific evidence published in Nature by Autumn et al. There, the authors performed the first direct measurements of the attraction force between surfaces and gecko structural feet elements.
Outline

• The Strategic Vision of the FLAG-ERA JTC 2016 RoboCom++ Project

• The FLAG-ERA RoboCom++ Project: scientific and technological challenges and objectives

• Activities implemented and significant results

• The RoboCom++ Project: towards a Robotics Flagship
Europe must pursue new frontiers to defend its leadership and to create NEW JOBS: a whole new Robotics is needed

We need **simplification mechanisms** and **new materials, fabrication technologies and energy forms**

We want to tap the greatest and most advanced treasure of engineering solutions:

- **Studying natural organisms** and understanding what makes them so smart and efficient.
- **Studying things only living organisms can do**, and how they do it.

http://robocomplusplus.eu
The RoboCom++ Project will pursue systematically invention and “disruptive” science-based innovation

The impact of the RoboCom++ FET-flagship-proof-of-concept Project will be characterized by partly unpredictable (but unavoidable) “quantum leaps” of scientific and technological advancements that will promote the third wave of Robotics.
The RoboCom++ Project: Rethinking Robotics for the Robot Companion of the Future

RoboCom++ is gathering the community and organising the knowledge necessary to rethink the design principles and fabrication technologies of future robots.

RoboCom++ aims at developing the Robot Companions of the year 2030, by fostering a deeply multidisciplinary, transnational and federated efforts.

<table>
<thead>
<tr>
<th>Project Key Details</th>
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<tr>
<td>Funded partners (received funding from NRFOs belonging to FLAG-ERA JTC 2016 Call Board of Funders)</td>
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<tr>
<td>In-Kind partners (participate in the Project activities with own or external resources)</td>
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<tr>
<td>Months duration</td>
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<td>Funding</td>
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</table>

http://robocomplusplus.eu
The RoboCom++ Consortium

1. Scuola Superiore Sant’Anna (Italy)  
2. Université Libre de Bruxelles (Belgium)  
3. University of Zagreb (Croatia)  
4. Tallinn University of Technology (Estonia)  
5. Centre National de la Recherche Scientifique/LAAS (France)  
6. Laboratoire National de Métrieologie et d’Essais (France)  
7. Istituto Italiano di Tecnologia (Italy)  
8. Riga Technical University (Latvia)  
9. National Institute for R&D in Microtechnologies (Romania)  
10. Universitatea Transilvania Brasov (Romania)  
11. Ecole Polytechnique Fédérale de Lausanne (Switzerland)  
12. Middle East Technical (Turkey)  
13. Bilkent University (Turkey)  
14. University Carlos III of Madrid (Spain)  
15. Weizmann Institute of Science (Israel)  
16. Czech Technical University (Czech Republic)  
17. Vrije Universiteit Brussel (Belgium)  
18. National Technical University of Athens (Greece)  
19. Universitat Politecnica de Catalunya (Spain)  
20. Cognitive Systems Research Institute (Greece)  
21. Technical University of Kosice (Slovakia)  
22. University of Plymouth (United Kingdom)  
23. University of Twente (The Netherlands)  
24. Consorzio Nazionale delle Ricerche (Italy)  
25. Universidad de Sevilla (Spain)  
26. Imperial College London (United Kingdom)  
27. University of the West of England (United Kingdom)

http://robocomplusplus.eu
The ambitious objectives of the RoboCom++ Project

RoboCom++ is pursuing a radically new design paradigm, grounded in the scientific studies of intelligence in nature. The emerging topics related to the Project include the concepts of bioinspired control and cognition, embodied intelligence, morphological computation, simplicity, developmental approaches, human-robot interaction, soft robotics and smart materials.

The robots of the future will effectively negotiate natural environments, better interact with human beings, and provide services and support in a variety of real-world, real-life activities. Ultimately, the Companion Robots conceived in RoboCom++ may foster a new wave of economic growth in Europe by boosting the deployment of ubiquitous robots and web-based robotic services.

The dawn of Bioinspired, Cognitive, Connected and Collaborative Soft Robot Companions of the Future

http://robocomplusplus.eu

Paolo Dario
The RoboCom++ project is pursuing its ambitious objectives by cooperating along three main lines of action.

1. BUILDING THE COMMUNITY

Building an interdisciplinary community of outstanding, highly motivated and committed experts and organisations.

A coordination of efforts and the construction of an interdisciplinary community by means of structured large-scale cooperation at the European level will be carried out. RoboCom++ will involve a wider community of roboticists and non-roboticists (including material scientists, mathematicians, AI experts, biologists, physicists, neuroscientists, economists, sociologists, philosophers and others). Currently, the members of the Community are 47 and they are organised in 7 Working Groups.

2. RESEARCH PILOT PROJECTS

Targeting exploratory pilots with the aim of investigating and assessing new discoveries and technologies relevant to RoboCom++ and that could be developed at a much larger extent during the envisioned future FET-Flagship on Robotics.

3. DEFINING S&T ROADMAP

Defining the long-term S&T roadmap, competitiveness strategy, governing and financing structure, and the ethical, legal, economic and social framework of a future FET Flagship on Robotics.
Outline

• Strategic Vision of the FLAG-ERA JTC 2016 RoboCom++ Project
• FLAG-ERA RoboCom++ Project: scientific and technological challenges and objectives
• Activities implemented and significant results
• The RoboCom++ Project: towards a Robotics Flagship
RoboCom++ is not alone!

The EU FET Flagship Preparatory Actions

EU FET Flagship

COORDINATOR: Prof. Cecilia Laschi, RoboCom++ Co-Investigator

www.roboticsflagship.eu

The European Coordination Hub for Open Robotics Development

Mission: FROM LAB TO MARKET
The robotics research project ECHORD++ promotes the interaction between robot manufacturers, researchers and users.

7 partners echord.eu

12 partners + 1 from EU13
http://www.terrinet.eu/

http://robocomplusplus.eu

19/04/2018 Paolo Dario
RoboCom++ is concretely paving the way to an envisaged ambitious and federated FET-Flagship on Robotics. Professor Cecilia Laschi, co-investigator of the RoboCom++ project, is the Coordinator of the Robotics Flagship proposal for a FET-Flagship Preparatory Action and she is supported by the whole RoboCom++ Consortium.

Team members
Cecilia Laschi (SSSA, Italy), Co-Investigator of RoboCom++
Barbara Mazzolai (IIT, Italy), Principal Investigator of RoboCom++
Stefano Stramigioli (University of Twente, Netherlands) Principal Investigator of RoboCom++
Dario Floreano (EPFL, Switzerland) Principal Investigator of RoboCom++
Jean-Paul Laumond (LAAS-CNRS, France), Co-Investigator of RoboCom++
Tamim Asfour (KIT, Germany)
Sabine Hauert (University of Bristol, United Kingdom)

First-stage proposal for the Preparatory Action submitted!
Future activities

• Enlarge the RoboCom++ COMMUNITY (WP1)
  Involvement of research groups from universities and other organizations representing the excellences working in the field of science-grounded robotics, biology, neurosciences, social sciences, or in those areas related to the topics covered by the Working Groups.

• Prepare Roadmaps on Strategic Research Topics (WP3 and SEVEN WGs)

• Prepare the 2nd stage proposal for the Preparatory Action of FET-Flagship on Robotics (if the 1st stage proposal will be accepted)

• Explore political aspects of the FET Flagship proposal
Rethinking Robotics for the Robot Companion of the future

Thank you for your attention

http://robocomplusplus.eu
Need

Self-Driving Uber Car Kills Pedestrian in Arizona, Where Robots Roam

By DAISUKE WAKABAYASHI  MARCH 19, 2018

Source: CNBC

Here’s everything you need to know about the Cambridge Analytica scandal

- Alongside social media giant Facebook, Cambridge Analytica is at the center of an ongoing dispute over the alleged harvesting and use of personal data. Both companies deny any wrongdoing.

- Britain’s Channel 4 News on Monday filmed senior executives at Cambridge Analytica, including its CEO Alexander Nix, suggesting the firm could use sex workers, bribes and misinformation in order to try and help political candidates win votes around the world.

- The saga is significant because of the way the harvested data might have been used. It was allegedly utilized to direct messages for political campaigns supported by Cambridge Analytica, most notably Trump’s election victory and the Brexit vote.

Source: New York Times

Source: Alan Kirman
Vision

„FuturICT 2.0 is about enabling a new kind of society, in which all members can know, understand, and together determine social processes in order to make our coexistence more sustainable.“

In WP3, FuturICT 2.0 is addressing the problem that financial incentives are misaligned with our societal goals. By creating new incentive systems, we can invert the negative unintended consequences of our actions into positive ones, for example, by incentivizing things like CO2 capture, recycling, the protection of biodiversity, the promotion of health, education, and community services.
## Consortium

<table>
<thead>
<tr>
<th>Partner Number</th>
<th>Country</th>
<th>Institution/Department</th>
<th>Principal Investigator (PI)</th>
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<tbody>
<tr>
<td>1 Coord.</td>
<td>Italy</td>
<td>CNR/ISTC</td>
<td>Mario Paolucci</td>
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<td>2</td>
<td>Switzerland</td>
<td>ETHZ/GESS</td>
<td>Dirk Heibling</td>
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<td>3</td>
<td>Italy</td>
<td>POLITO/DISAT</td>
<td>Anna Carbone</td>
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<td>4</td>
<td>France</td>
<td>IRSTEA / LISC</td>
<td>Guillaume Defuant</td>
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<td>5</td>
<td>France</td>
<td>CAU/LAPSCO</td>
<td>Serge Guimond</td>
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<td>6</td>
<td>France</td>
<td>CNRS / ISC-PIF</td>
<td>David Chavalarias</td>
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<td>7</td>
<td>Latvia</td>
<td>RTU/DESC</td>
<td>Bruno Zuga</td>
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<td>8</td>
<td>Latvia</td>
<td>RTU/ITI DMS</td>
<td>Egils Ginters</td>
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<td>Romania</td>
<td>UTBV/DAIT</td>
<td>Alina Itu</td>
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<td>Belgium</td>
<td>UCL/Math</td>
<td>Jean-Charles Delvenne</td>
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<td>11</td>
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<td>ULB</td>
<td>Tom Lenaerts</td>
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<td>12</td>
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<td>Unamur</td>
<td>Renaud Lambiotte</td>
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<td>TTÜ/IoC</td>
<td>Tarmo Soomere</td>
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Supporters

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<td>Université de Namur</td>
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<td>Université Libre de Bruxelles</td>
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<td>Estonian Academy of Sciences</td>
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<td>SIX Group</td>
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<td>Pix Videos Production</td>
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Outlook 2018

- New videos in production to be released in April 2018
- Workshop Climate City Olympics, Vienna, May 2018
- Cryptoeconomics Workshop, London, Summer 2018 (TBC)
- New communication channels (podcast, etc.) to be launched
- Expanding the network
- Development of 1st Finance 4.0 prototype
- Research Plan
Links to FET Flagship Pilots

• Involved in two Flagship pilot proposals

• Humane AI – Coordinator DFKI (DE)
  Toward AI Systems that Augment and Empower Humans by Understanding us, our Society and the World around us.
  ➢ Joint vision of understanding the underlying mechanisms of societies.

• Digital Agora – Coordinator CNR Rome (IT)
  Science and Technology for Understanding and Designing a Value-Driven Digital Europe.
  ➢ Joint vision of using technologies for sustainable societies and the social good.
Summary

• Project makes good progress.

Challenges

• Research teams could be better linked
• Funding delay put restrictions on WP2 and WP5

Opportunities

• Open to involve new partners; strong interest e.g. in Slovenia and Spain
• Strength in blockchain research and network
Thank you for your attention!

ETH Zürich
Mr. Stefan Klauser
Project Lead FuturICT 2.0
Co-Founder Blockchain & IoT School BIOTS
Member of the Board at BlockchainX
Computational Social Science COSS
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www.coss.ethz.ch
www.futurlICT2.eu
www.biots.org
www.blockchainX.ch
Joint Transnational Call (JTC) 2016
for Flagship-proof-of-concept projects on
Digital Medicine for Cancer

ITFoC – IT Future of Cancer (Treatment)

Nora Benhabiles, PhD, EMBA
CEA France
Flag Era call 2016 corresponding to a domain of a Flagship Pilot (among the 4 proposed)

Digital Medicine for Cancer (DMC) => IT Future of Cancer, ITFoC

Proposal CSA phase 1
HEALTH SPENDING FOR ALMOST 10% OF THE GDP IN EUROPE

IN MANY COUNTRIES, THE SHARE OF GDP ALLOCATED TO HEALTH HAS STABILISED OR DECREASED SINCE 2009...

AND HEALTH SPENDING MAINLY GROW IN LINE WITH GDP

MORE THAN 75% OF HEALTH SPENDING IS PUBLICLY FINANCED IN EU

DIRECT OUT OF POCKET PAYMENT REPRESENTS 15% IN EU (TRENDS GROW)

MORE THAN 1.2 MILLION DEATH COULD BE AVOIDED THROUGH BETTER PUBLIC HEALTH, PREVENTION POLICIES, MORE EFFECTIVE AND TIMELY HEALTH CARE

Source OECD Health statistics 2016; Eurostat database; WHO, Global Health Expenditure database
« Despite extraordinary advances (...), we have a long way to go in understanding why different individuals experience disease or respond to treatment differently ». Our current lack of ability to predict an individual patient’s treatment success for most diseases and conditions means that clinicians have no choice but to follow a less than optimal approach in prescribing drugs and other treatment options.

Source: Spear et al. 2001 and FDA 2013 « Paving the way for personalized medicine »
THE FLAG -ERA ITFoC, A TRANSNATIONAL PARTNERING PROJECT

17 Partners
Research Organisations & Networks, Universities, University Hospitals, SMEs, Industry

6 countries
France, Italy, Turkey, Romania, Latvia & Germany (unfunded partner)

Full value chain of expertise

Experimental, computational, clinical and networking aspects

Participating countries for DMC: BE, EE, FR, IT, LV, RO, TR
2 peer-reviewed publications:

Numerous national & International conferences

Outreach – Seminars at Medical Schools on the use of multiomics in personalised treatment of breast cancer patients (P12 – Acabidem)

Grant Applications:
- Stage 1 Preparatory FET Flagship application (20th Feb 2018) - consortium wide
  - TUBITAK – metagenomic profiling of triple negative breast cancers – P12 &13

Company willing to join the project
- OWKIN FRANCE– P7 – Machine learning for data discovery in medicine (ENS -> OWKIN)
  http://owkin.com/
• Roadmap development for DigiTwins Future Flagship call ongoing: (www.digitwins.org)

• Coordination Team (CSA): Hans Lehrach (MPIMG), Nora Benhabiles (CEA), Rolf Zettl (BIH)

• Concept already gathered strong support from EU Member States, industry, academia and EU initiatives

• 1st stage proposal submitted 20th February 2018.
DIGITWINS: Digital Twins for Better Health

www.digitwins.org
ITFoC serves as one of DigiTwins Medical & Technological Demonstrators, technological innovations

Demonstration of the DigiTwin concept in breast cancer in hospitals in Europe

Establishment of a multidisciplinary community within Europe and beyond community working towards a unifying goal
WE THANK YOU FOR YOUR ATTENTION

The ITFoC and the DigiTwins community