

#### FLAG-ERA II Deliverable D8.4 JTC 2016 projects seminar 2 presentations

| Work package           |             | 8   |   |  |                 |
|------------------------|-------------|---|---|--|-----------------|
| Task                   |             | 8.2   |   |  |                 |
| Date of                | Contractual | 30/11/2019 (36)   |   |  |                 |
| delivery               | Actual      | 30/11/2019 (36)   |   |  |                 |
| Code name              |             | D8.4  | V | ersion 1.0   | Draft 🗌 Final 🛛 |
| Type of deliverable    |             | Report  |   |  |                 |
| Dissemination level    |             | PU=Public   |   |  |                 |
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| EC project officer     |             | Jean-Marie Auger  |   |  |                 |
| Description of content |             | This deliverable documents the JTC 2016 2 <sup>nd</sup> 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 Agenda

#### 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

| Time       | Dur. | Item / goals  | Speaker      | Participants      |
|------------|------|---|--------------|-------------------|
| 13:30      | 1h00 | Lunch and welcome   |              |                   |
| 14:30 0h20 |      | Introduction  |              | FLAG-ERA JTC      |
|            |      | <ul> <li>Introduction to the seminar: Objectives and</li> </ul> | MIUR         | 2016 stakeholders |
|            |      | reminder on the FET Flagship model                              |              |                   |
| 14:50      | 0h40 | Feedback on the Flagship experience                             |              |                   |
|            |      | The HBP experience: Unifying vision,                            | НВР          |                   |
|            |      | organisation, synergies with partnering projects,               |              |                   |
|            |      | achievements and perspectives                                   | TAIPI        |                   |
|            |      | Setting up key performance indicators for large                 |              |                   |
|            |      | programmes  |              |                   |
| 15:30      | 1h00 | Project presentations   |              |                   |
|            |      | RoboCom++: Rethinking Robotics for the Robot                    | RoboCom++    |                   |
|            |      | Companion of the future   | ITFoC        |                   |
|            |      | ITFoC: Information Technology: Future of Cancer                 |              |                   |
|            |      | Treatment   |              |                   |
| 16:30      | 0h30 | Coffee break  |              |                   |
| 17:00      | 1h00 | Project presentations (continued)                               | 0            |                   |
|            |      | Convergence: Frictionless Energy Efficient                      | Convergence  |                   |
|            |      | Convergent Wearables For Healthcare and                         |              |                   |
|            |      | Lifestyle Applications  | FuturICT 2.0 |                   |
|            |      | <ul> <li>FuturICT 2.0: Large scale experiments and</li> </ul>   |              |                   |
|            |      | simulations for the second generation of FuturICT               |              |                   |
| 18:00      | 0h30 | General discussion and next steps                               | ANR          |                   |
| 18:30      |      | End of JTC 2016 project follow-up seminar                       |              |                   |



#### Annex 2 - JTC 2016 Project Follow up Seminar presentations

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# 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
- Monitor the evolution of the projects in the context of the preparation of new Flagship CSA\Pilots



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#### JTC 2016 Project Seminar - Agenda

| Time  | Duration | Item / goals  | Speakers   |
|-------|----------|---|--|
| 14:30 | 0h20     | <ul> <li>Introduction</li> <li>Introduction to the seminar: Objectives and updates on the FET Flagship model</li> </ul>   | Edouard Geoffrois<br>(ANR), Eugenio<br>Guglielmelli (MIUR) |
| 14:50 | 0h40     | <ul> <li>Feedback on the Flagship experience</li> <li>The HBP experience: Unifying vision, organisation, synergies with partnering projects, achievements and perspectives</li> <li>Setting up key performance indicators for large programmes</li> </ul>                             | Martin Telefont<br>(HBP)<br>Florian Knecht<br>(TAIPI)      |
| 15:30 | 1h00     | <ul> <li>Project presentations</li> <li>RoboCom++: Rethinking Robotics for the Robot Companion of the future</li> <li>ITFoC - Information Technology: Future of Cancer Treatment</li> </ul>   | Paolo Dario<br>Nora Benhabiles                             |
| 16:30 | 0h30     | Coffee break  |  |
| 17:00 | 1h00     | <ul> <li>Project presentations (continued)</li> <li>Convergence: Frictionless Energy Efficient Convergent<br/>Wearables For Healthcare and Lifestyle Applications</li> <li>FuturICT 2.0: Large scale experiments and simulations for<br/>the second generation of FuturICT</li> </ul> | Adrian Ionescu<br>Stefan Klauser                           |
| 18:00 | 0h30     | General discussion and next steps   | Edouard Geoffrois (ANR)                                    |
| 18:30 |          | End of JTC 2016 project follow-up seminar   |  |



### 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-ofconcept" 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 1<sup>st</sup> Project Seminar: Madrid, FLAG-ERA II Project Seminar 4, March 22, 2018





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## JTC 2016 selected projects

| Торіс                              | Acronym and title   | Coordinator     | Countries in<br>partnership*  |
|------------------------------------|---|-----------------|---|
| Cooperative Robots                 | <b>RoboCom++:</b> Rethinki<br>ng Robotics for the<br>Robot Companion of<br>the future   | Paolo DARIO     | IT, BE, CH, HR, <i>CZ</i> ,<br>EE, <i>ES</i> , FR, <i>GR</i> , <i>IL</i> ,<br>LV, <i>NL</i> , RO, SK, <i>UK</i> ,<br>TR |
| Digital Medicine for<br>Cancer     | ITFoC: Information<br>Technology: Future of<br>Cancer Treatment   | Nora BENHABILES | FR, <i>DE</i> , IT, LV, RO, TR  |
| High-Efficiency<br>Sensor Networks | <b>CONVERGENCE:</b> Frict<br>ionless Energy Efficient<br>Convergent Wearables<br>For Healthcare and<br>Lifestyle Applications | Adrian IONESCU  | <b>CH</b> , BE, EE, FR, IT, LV,<br>TR   |
| ICT for Social<br>Sciences         | FuturICT 2.0: Large<br>scale experiments and<br>simulations for the<br>second generation of<br>FuturICT                       | Mario PAOLUCCI  | IT, CH, EE, FR, BE, LV,<br>RO   |

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
- Call H2020-FETFLAG-2018-2020 FET FLAGSHIPS "Tackling grand interdisciplinary science and technology challenges"
  - 1<sup>st</sup> stage: 33 proposal submitted by February 20, 2018
  - 2<sup>nd</sup> stage: deadline September 18, 2018

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## **Timeline for new FET-Flagships**



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## 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.



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#### Lessons learned - References

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





European Commission

## 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 ICTbased 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.
- 4. Mapping trends in values for the future of Europe.
- 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.









### 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





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## Report of Prof. Mariana Mazzucato



"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."







#### MISSIONS

Mission-Oriented Research & Innovation in the European Union

A problem-solving approach to fuel innovation-led growth by Mariana MAZZUCATO



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, crosssectoral and cross-actor innovation
- Set a clear direction: targeted, measureable and time-bound
- Require multiple, bottom-up solutions





Service

Sector

Social

standards and

caregiving

approaches



From the Report by Prof. Mariana Mazzucato

#### **A CLEAR DIRECTION:** TARGETED, **MEASURABLE AND TIME-BOUND**

Target is to reducie 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.



European Commission 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.



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#### 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

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## FRICTIONLESS ENERGY EFFICIENT CONVERGENT WEARABLES FOR HEALTHCARE AND LIFESTYLE APPLICATIONS – Progress Year 1

LUCA SELMI, SAVERIO DEVITO, ELISE SAOUTIEFF, ADRIAN IONESCU

FLAG ERA MEETING, MADRID - MARCH 22, 2018

## CONCEPT & GOALS (1)

# 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



FLAG ERA MEETING, MADRID - MARCH 22, 2018

## 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
- 11. ENEA Italian National Agency for New Technologies, Energy and Sustainable Economic
- 12. UNICA Università degli Studi di Cagliari
- 13. G-INP Institut Polytechnique de Grenoble
- 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 <u>www.health-eu.eu</u> 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*] → *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*] → *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 life style 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/nanosystems, 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

# 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.
SCIENCE BUSINESS Bringing together industry, research and policy

#### The Network

Meet with universities and research centres, corporate executives, international investors, top European policy makers as well as regional and national organisations dedicated to stimulate innovation.

More info »



#### 01 Mar 2018 | Network News

With Health EU, everyone will have a avatar to manage their health Press release



In the future, will people have virtual twins to he' what Health EU is proposing. This major projec, EPFL, is in the running to be a European Unio will receive €1 billion in financing over ten y

Un double de soi-même sous forme virtuelle, pour mieux gérer sa santé et se soigner plus efficacement. https://www.gartner.co/ tuttoSCIENZE ANNE-CHARLOTTE MOLLER 28.02.2018

#### LASTAMPA

A CURA DI: GABRIELE BECCARIA REDAZIONE: CLAUDIA FERRERC



**Edicola digitale** Sfoglia tuttoscienze in versione cartacea

f

#### INTELLIGENZA ARTIFICIALE

Il gemello-avatar che ci g' 



Et si chacun disposait d'un jumeau digital, un double de lui mâma nui ráunirait truttae eae drandae narconnalicáe nou Et si chacun disposait d'un jumeau digital, un double de luimeme qui reumirait toutes ses donnees personnaitsees Health EU, un projet mené par 47 partenaira dirige par l'École polytechnique fédére en coordination avec un incritiv T n avatar per ciascuno, da usare come un gemello virtuale p. cure personalizzate: è il primo passo verso l'Internet della salute, m biologici, insieme con abitudini e stili di vita, saranno interpretati dall'Inte. Artificiale. È l'obiettivo del programma «Health EU», coordinato dal Politecnico di Losanna ricercatori di 47 istituti e aziende di 16 Paesi.



**Business & Career** 

Campus li

# Médicines Le VIRTUEL AVEN des est van den bero FLadship Les avatars imaginés Personnelles de chas par le proise tit son at the proise Mention de les de chas par le proise Mention de les de chas par les de chas par le proise Mention de les de chas par les Les avatars imaginés par le projet Health UE réuniraient toutes les données de chaque individu pour un suivi médical plus efficace. L'idée Les avatars imaginés par le projet Health UE réuniraient toutes les données de chaque individu pour un suivi médical plus efficace. L'idée

samenwerkingsverband een gooi naar een EU let idee: mensen krijgen een virtuele tweeling die e monitoren en beheersen. Als het voorstel in ordt, krijgt het consortium een miljard euro aar.



Un gemello avatar per ogni paziente europeo, verso cure su misura

Adnkronos Salute | 27/02/2018

\$ 48

Roma, 27 feb. (AdnKronos Salute) - E se ognuno di noi avesse il proprio gemello avatar - una replica virtuale di noi stessi - per migliorare la gestione della propria salute e poter ricevere cure davvero personalizzate? Con questo obiettivo nasce il progetto Health Eu, il cui slogan è O "Avatar umani per prevenire e curare le malattie". Si Ð tratta di un progetto internazionale, guidato da un consorzio diretto dall'Epfl (Ecole Polytechnique Federale di Losanna) in collaborazione con l'Institute for Human Organ and Disease Model Technologies con sede nei Paesi Bassi, che ha recentemente fatto domanda per

diventare una Fet Flagshin

Sullo stesso argomento Adakronos Salute Gemelli, incontro su medicina personalizzata con Nobel Ser

e Huber

Adnkronos Salute Per notte europea ricercator due appuntamenti Neuromed

Adakronos Salute Cardiopatie congenite, 420 pazienti curati in 5 anni cor percorso Guch

## 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













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### 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



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### Grand Vision and Strategy to build a new European and Global Framework for Robot Companions. The ROLE of FLAG-ERA RoboCom++ FET FLAGSHIP Proof-of-concept Project



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





### The 'Second Wave': the consolidation of Industrial Robotics and the coming of SERVICE ROBOTS

RoboCom



## The Second Wave (today): some figures

"[...] 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. [...]"



Sources: International Federation of Robotics, Japan Robot Association; Japan Ministry of Economy, Trade & Industry; es/Robotics; company filings; BCG analysis.

Robotics is one of the 12 disruptive technologies identified by McKinsey (2015 Report)



Disruptive technologies: Advances that will transform life, business, and the global economy



### http://robocomplusplus.eu



Note: UAV = unmanned aerial vehicle; UGV = unmanned ground vehicle; UUV = unmanned underwater vehicle. Estimates do not include the cost of engineering, maintenance, training, or peripherals.

## The 'Second Wave' of Robotics is NOW!



### 2016-2019: US\$ 45 billion sales value





1.4 million industrial robots will be installed in the factories to increase productivity

IFR

Hosted by

VDMA

VDM/

International

Federation of Reportics Con

333,000 service robots for professional use will be sold to nonmanufacturing 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



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## **Milestones of Robotics**





splus.eu

# Are today's robots ready for the bright future that industrial analysts predict? The answer is NO!

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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 bioinspired 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,

#### SCIENCE ROBOTICS | RESEARCH ARTICLE

#### PROSTHETICS

Hybrid EEG/EOG-based brain/neural hand exoskeleton restores fully independent daily living activities after quadriplegia

S. R. Soekadar,<sup>1,2</sup>\* M. Witkowski,<sup>1,2</sup> C. Gómez,<sup>3</sup> E. Opisso,<sup>3</sup> J. Medina,<sup>3</sup> M. Cortese,<sup>4</sup> M. Cempini,<sup>4</sup> M. C. Carrozza,<sup>4</sup> L. G. Cohen,<sup>5</sup> N. Birbaumer,<sup>2,6</sup> N. Vitiello<sup>4,7</sup>

#### SCIENCE ROBOTICS | REVIEW

#### BIOMATERIALS

### Biohybrid actuators for robotics: A review of devices actuated by living cells

January 31, 2018

ROBOTICS

Leonardo Ricotti,<sup>1</sup>\* Barry Trimmer,<sup>2</sup> Adam W. Feinberg,<sup>3</sup> Ritu Raman,<sup>4</sup> Kevin K. Parker,<sup>5</sup> Rashid Bashir,<sup>6</sup> Metin Sitti,<sup>7</sup> Sylvain Martel,<sup>8</sup> Paolo Dario,<sup>1</sup> Arianna Menciassi



**Cover, January** 2018

#### SCIENCE ROBOTICS | REVIEW

#### SOFT ROBOTICS

Soft robotics: Technologies and systems pushing the boundaries of robot abilities

Cecilia Laschi,<sup>1</sup>\* Barbara Mazzolai,<sup>2</sup> Matteo Cianchetti<sup>1</sup>

#### SCIENCE ROBOTICS | FOCUS

#### HUMANOIDS

Sense of movement: Simplifying principles for humanoid robots

Egidio Falotico, <sup>1</sup>\* Alain Berthoz, <sup>2</sup> Paolo Dario, <sup>1</sup> Cecilia Laschi<sup>1</sup>

Brain simplifying principles can improve robot capabilities, but currently robotic control takes different paths.





Ten grand challenges of *Science Robotics* 



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

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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.





### The RoboCom++ Project will pursue systematically invention and "disruptive" science-based innovation

The impact of the RoboCom++ Fetflagship-proof-ofconcept Project will be characterized by partly unpredictable (but unavoidable) "quantum leaps" of scientific and technological advancements that will promote the third wave of Robotics



RoboCóm

### 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.

### **Project Key Details**

| Funded partners (received funding from NRFOs belonging to FLAG-ERA JTC 2016 Call Board of Funders) | 13             |
|--|----------------|
| In-Kind partners (participate in the Project activities with own or external resources)            | 14             |
| Months duration  | 36             |
| Funding  | 2.825.012,05 € |



## 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 Métrologie 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 25.Universidad de Sevilla (Spain) (Switzerland) 26.Imperial College London (Unit
- 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)
- 26.Imperial College London (United Kingdom)27.University of the West of England (United Kingdom)



## 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, simplexity, 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



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





http://robocomplusplus.eu









### 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



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## **RoboCom++ is not alone!**





### Proposal for a Preparatory Action for a FET Flagship on Robotics



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)

Robotics

## The plan of the RoboCom++ Project



RoboCom

### **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



## Thank you for your attention



























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UNIVERSITY OF TWENTE.







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## FuturICT 2.0 – Y1 Report

Joint Transnational Call (JTC) 2016 for Flagshipproof-of-concept projects

### Madrid Meeting, March 22, 2018 Stefan Klauser, ETH Zurich







Need

TECHNOLOGY

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

By DAISUKE WAKABAYASHI MARCH 19, 2018

### Source: CNBC



### Source: Alan Kirman



### 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

## 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

| Partner<br>NumberCountryInstitution/<br>DepartmentPrincipal<br>Investigator (PI)1 Coord.ItalyCNR/ISTCMario Paolucci2SwitzerlandETHZ/GESSDirk Helbing3ItalyPOLITO/DISA<br>TAnna Carbone4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte |          | <u> </u>    |                    |                          |
|---|----------|-------------|--------------------|--------------------------|
| NumberDepartmentInvestigator (PI)1 Coord.ItalyCNR/ISTCMario Paolucci2SwitzerlandETHZ/GESSDirk Helbing3ItalyPOLITO/DISA<br>TAnna Carbone4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | Partner  | Country     | Institution/       | Principal                |
| 1 Coord.ItalyCNR/ISTCMario Paolucci2SwitzerlandETHZ/GESSDirk Helbing3ItalyPOLITO/DISA<br>TAnna Carbone<br>Deffuant4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | Number   |             | Department         | Investigator (PI)        |
| 2SwitzerlandETHZ/GESSDirk Helbing3ItalyPOLITO/DISA<br>TAnna Carbone<br>Guillaume<br>Deffuant4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte   | 1 Coord. | Italy       | CNR/ISTC           | Mario Paolucci           |
| 3ItalyPOLITO/DISA<br>TAnna Carbone<br>Guillaume<br>Deffuant4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 2        | Switzerland | ETHZ/GESS          | Dirk Helbing             |
| 4FranceIRSTEA / LISCGuillaume<br>Deffuant5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte   | 3        | Italy       | POLITO/DISA<br>T   | Anna Carbone             |
| 5FranceCAU<br>/LAPSCOSerge Guimond6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 4        | France      | IRSTEA / LISC      | Guillaume<br>Deffuant    |
| 6FranceCNRS / ISC-<br>PIFDavid Chavalarias7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 5        | France      | CAU<br>/LAPSCO     | Serge Guimond            |
| 7LatviaRTU/DESCBruno Zuga8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 6        | France      | CNRS / ISC-<br>PIF | David Chavalarias        |
| 8LatviaRTU/ITI DMSEgils Ginters9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte   | 7        | Latvia      | RTU/DESC           | Bruno Zuga               |
| 9RomaniaUTBV/DAITAlina Itu10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 8        | Latvia      | RTU/ITI DMS        | Egils Ginters            |
| 10BelgiumUCL/MathJean-Charles<br>Delvenne11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte  | 9        | Romania     | UTBV/DAIT          | Alina Itu                |
| 11BelgiumULBTom Lenaerts12BelgiumUnamurRenaud Lambiotte   | 10       | Belgium     | UCL/Math           | Jean-Charles<br>Delvenne |
| 12 Belgium Unamur Renaud Lambiotte  | 11       | Belgium     | ULB                | Tom Lenaerts             |
|   | 12       | Belgium     | Unamur             | Renaud Lambiotte         |
| 13 Estonia TTÜ/IoC Tarmo Soomere  | 13       | Estonia     | TTÜ/loC            | Tarmo Soomere            |





## **Supporters**

| Institution                            | Country |
|--|---------|
| Université de Namur                    | BE      |
| Université Libre de Bruxelles          | BE      |
| Università della Svizzera Italiana     | СН      |
| IBSEN Project                          | ES      |
| Universitat de Valencia                | ES      |
| Warsaw University of Technology        | PL      |
| Leiden University                      | NL      |
| EPFL                                   | СН      |
| zhaw School of Engineering             | СН      |
| Bern University of Applied Science     | СН      |
| Estonian Academy of Sciences           | EE      |
| ICT4Peace Foundation                   | СН      |
| The Global Brain Institute             | BE      |
| Baltic Studies Center                  | LV      |
| Vidzeme Planning Region                | LV      |
| ICES Foundation                        | СН      |
| Lykke Corp.                            | СН      |
| Swiss Finance & Technology Association | СН      |
| ICT Switzerland                        | СН      |
| Validity Labs                          | СН      |
| Economiesuisse                         | СН      |
| SIX Group                              | СН      |
| Pix Videos Production                  | ES      |



## 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

#### 1.1 Conceptual design

| Area            | Research focus  |
|-----------------|---|
| CryptoEconomics | <ul> <li>The function of tokens (as currency, security, or asset) and taxonomy</li> <li>Integration of a collective decision-making mechanism</li> <li>Community creation of tokens</li> <li>Conceptual design of reputation mechanism</li> </ul> |
| Governance      | <ul> <li>Decentralized autonomous organizations as governance structures</li> <li>Integration of AI capabilities</li> </ul>   |

#### 1.2 Architectural design & Technologies

| Focus area   | Research   |     |
|--------------|--|-----|
| Architecture | <ul> <li>Solution design for external (IoT) data oracles</li> <li>Design of decentralized markets</li> <li>Beta version of architectural design (objects and processes)</li> </ul> |     |
| Fin4 system  | <ul> <li>Requirements Analysis</li> <li>Integration strategy based on existing building blocks</li> <li>Alpha version</li> </ul>   | - 1 |
| Арр          | <ul> <li>Allowing different cryptoeconomic designs and tokens</li> <li>To be used in experiments and simulations</li> <li>Alpha version</li> </ul>                                 | _1  |



## 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 Clausiusstrasse 50 8092 Zurich, Switzerland

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## 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









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



### PERCENTAGE OF PATIENTS FOR WHOM DRUGS ARE INEFECTIVE

« 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.





### 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

Information Technology, bioinformatics, mathematics, systems biology modelling, High Performance Computing, Artificial Intelligence, functional genomics, metabolomics and cancer research, biology and medicine, regulatory, ethics.

#### Experimental, computational, clinical and networking aspects



Participating countries for DMC:BE, EE, FR, IT, LV, RO, TR



### **ITFOC DISSEMINATION AND VALORISATION**

#### 2 peer- reviewed publications:

- Damiani et al 2017, PLoS Comput Biol 13(9): e10005758
- Girardeau et al 2017 BMC Med Res Methodol. 17(1):36

#### 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 dsiscovery 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
- 1<sup>st</sup> stage proposal submitted 20<sup>th</sup> February 2018.



### **DIGITWINS: Digital Twins for Better Health**



www.digitwins.org



DIGITWINS: Digital Twins for Better Health Better diagnosis, better care, better life & ITFoC : IT Future of Cancer

- 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

