EU Funding Priorities in robotics in Horizon 2020

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Outline

- Robotics at the heart of digital innovations
- From R&D&I to an industrial strategy for robotics
- Building on achievements so far
  - Robotics in FP7
  - First calls in H2020
- Looking ahead

Major tracks driving digital innovations

- "Big data"
  - Analytics, decision support systems, modelling, simulation,..
- IoT, smart connected objects,
  - Cyber-physical systems,
- Advanced robotics
  - Autonomous systems
- KETs: Smart sensors, MEMs, photonics
  - More Moore, ..
- Hyper connectivity and higher computing power
  - Cloud, HPC, embedded micro-servers..

Importance of robotics

- Essential for the competitiveness of all industries
  - Reindustrialisation, ageing workforce, ..
- Essential to address our societal challenges
  - Health, ageing population, environment, security
- Strategic importance for our safety, security
  - Dual use
- A high growth market
  - Double digit growth, emergence of service markets
- Autonomous systems are transforming ICT
  - And not only ICT but also automotive, etc..

Main challenges

- Transform promptly research and knowledge assets into commercial/industrial successes
  - New business opportunities are picking up
  - Recent acquisitions/announcements raise expectations
  - Competition will only grow accelerating innovations pace

- Capitalise on strengths in industrial and professional markets to capture new growth areas
  - "Consumer" markets, but also aerials, autonomous mobility, robotised surgery, elderly, etc..
  - Require different business models, production schemes, ...

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What to do about it?

- Maintain leading edge technology
  - Creating differentiating factors across the value chain
    - From cognitive systems and sensing up to robotic applications
  - Access to technology, notably SMEs

- Wide adoption across society and industry
  - Industrial robots beyond "high-tech" industries
    - Huge opportunity for re-shoring and for product innovation
  - In public sector services: health, security, etc..
  - In our homes, cities, etc..

- ELS, Acceptability of robots
- ….

Commission's approach to industrial strategies

- Work in partnerships
  - PPPs as EU–wide ecosystems for innovation and business growth
- Address the whole value chain and innovation chain
  - R&D&I providing differentiating factors across the value chain
  - Supply-demand interaction, multiple stakeholders
  - SMEs as key players
- Connect to national and regional actions
  - Pool resources to reach critical mass, align strategies and policies
  - Links to hubs of excellence and regional clusters
- Combine policies to achieve goals
  - Beyond financial to support to R&D&I
  - State aid, standards, access to finance, etc.
  - Skills, outreach
  - Links with other fields (in LEIT, societal challenges and FET)

Our instruments

- Financial:
  - R&D&I instrument toolbox (Horizon 2020)
    - Research projects, innovation actions, pilot lines, large-scale demonstrators, pre-commercial procurement, SME scheme, …
  - European Structural and Investment Funds (ESIF)
    - Bringing regions to dedicate investments to ICT, to foster the emergence of clusters through regional smart specialisation strategies

- Awareness raising, mobilisation, coordination
  - Stakeholder engagement, community building
  - Political leadership to mobilise stakeholders, investors,

- Legislation when needed/mandated
  - E.g. Liability issues, responsibility, standardisation
  - Adaptation of state-Aid rules
    - more favourable to investments
    - European Important Projects of Common Interest

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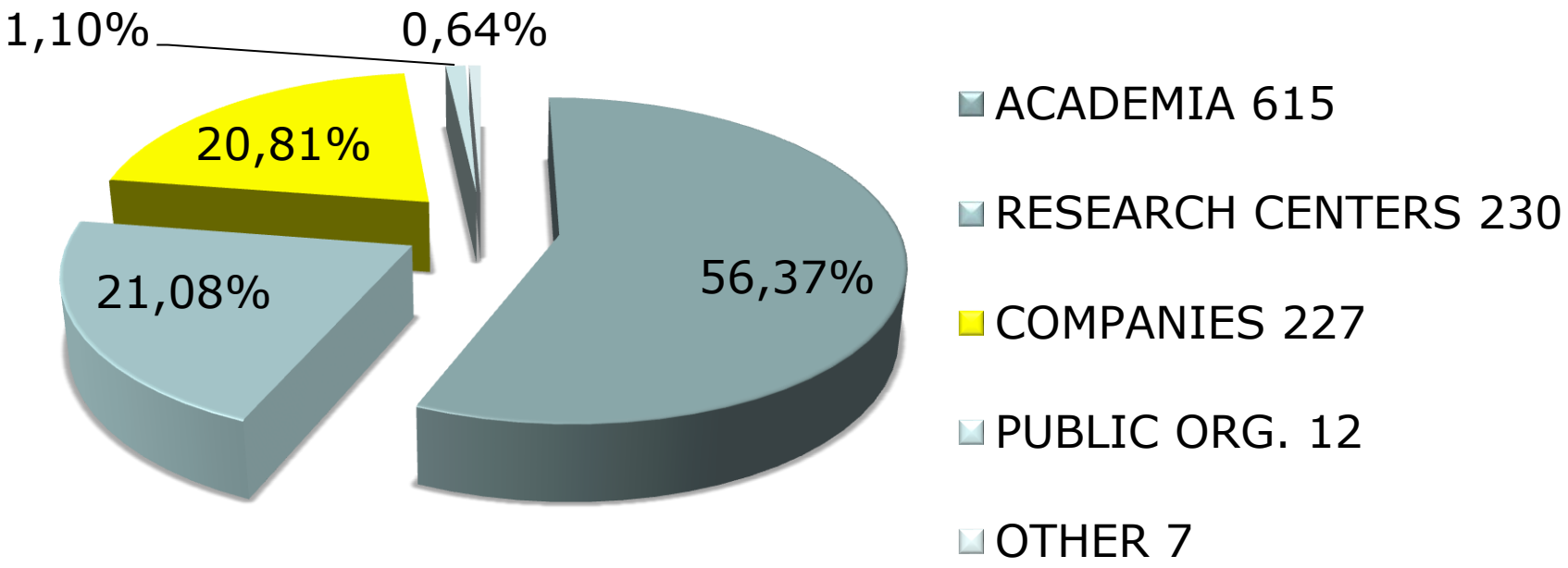
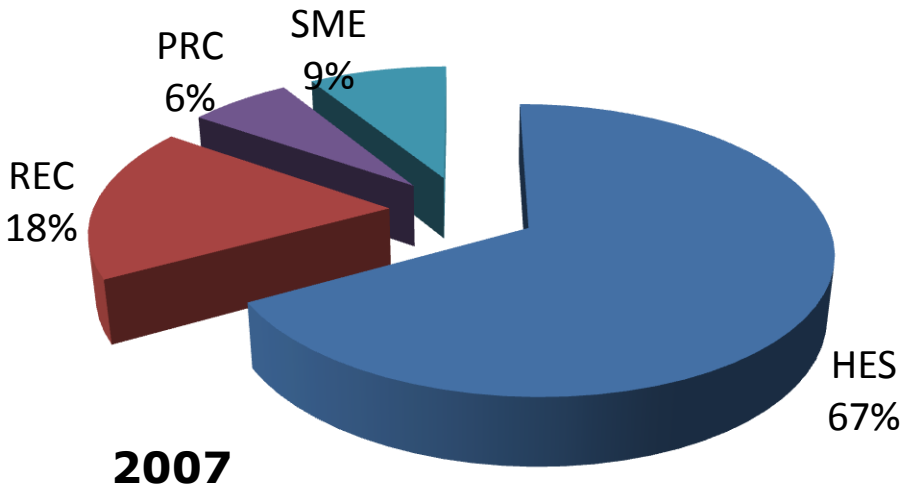
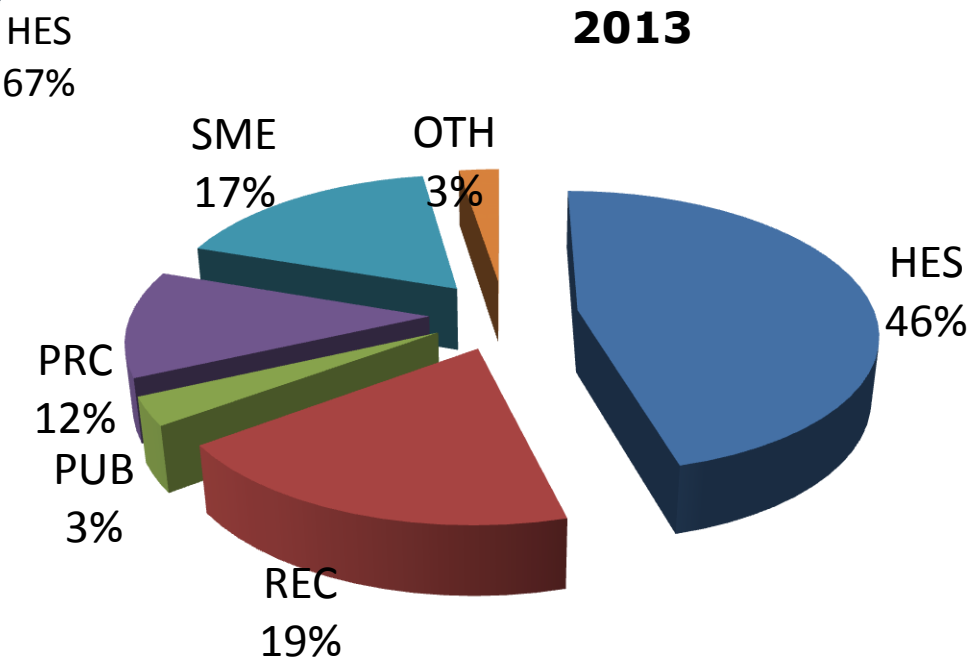
Robotics in FP7
In total more than 550 M€ of investments

- *Evolution: Industry from 15% (2007) to 30% (2013)*
- *SMEs represent 55 % of companies*



Participation evolution





PPP in Robotics - State of Play

- PPP in Robotics officially signed and launched in Dec 2013
- First Partnership Board meeting held in February in Brussels
- First H2020 Work Programme developed in close collaboration with private side (prioritisation of market domains)
- EC engagement up to 700 M€ to support the PPP in 2014-20
  - + additional 150-250 M€ for robotics in other parts of H2020
    - Including FoF, Health and elderly SC, FET, transport etc..

Good cooperative spirit! PPP delivers!

PPP in Robotics – SPARC

Industry

Academia

End-Users

Work Programme

Call implementation

From the cPPP objectives

- Establish/maintain a competitive "robotics industry" support the whole economy and address the societal challenges

- Quantified targets: A strong European Robotics industry for a competitive Europe
  - Europe's supply share of the world market in 2020
    - Overall 42% of ~62bn€ by 2020
    - industrial robotics: 35% of 43bn€
    - professional service: 65% of 16bn€ (healthcare, environment, agriculture)
    - consumer service robotics: 20% of 2.4bn€ (vacuum cleaner, lawnmower)

EU funding 2014-15

- €74 million in 2014
- RTD to advance key technologies relevant for industrial and service robotics –
- prioritised domains: manufacturing, agriculture, civil, commercial
- Innovation: Robotics use cases (deployment in real-world environments)
- 17 new projects starting in 2015

EU funding 2014-15

- €80 million in 2015
- RTD to advance key technologies relevant for industrial and service robotics:
  - prioritised domains: healthcare, consumer, transport
- Industry-academia cross-fertilisation
- Robotics use cases
- Pre-commercial procurement in robotics: especially healthcare
- Call for project proposals opened in October 2014, closed in April 2015

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Orientations for WP2016-17

- Support to the PPP roadmap
  - ~ 160 M€
- Advanced robot capabilities

  systems development; interaction; mechatronics and perception / navigation / cognition
  - R&D
    - robots responding flexibly, robustly and efficiently to the everyday needs of workers and citizens

- Innovation:
  - Systems development, human-robot interaction, mechatronics, perception, navigation and cognition.

  - End user-driven application developments

Orientations: WP2016-17

- Robot system abilities

  configurability; adaptability; interaction capability; dependability; motion capability; manipulation and grasping; perception; decisional autonomy

  - R&D
    - dependability, social interaction ability and cognitive ability
    - Multiple actors systems
    - SME & benchmarking actions, safety certification

  - Innovation
    - Pilot installations
    - System development uptake
    - Pre-commercial Procurement
    - Competitions

Examples of interesting projects

European Commission

euRathlon

Support Action for a Targeted Intelligent Autonomous Robotics Contest: The European Roboathlon

Search & Rescue activities

COMPETITIONS – WORKSHOPS

- **Land, 2013**
- **Underwater, 2014**
- **Land + Underwater + Air, 2015**

testing the intelligence and autonomy of robots in realistic mock emergency-response scenarios (inspired by the Fukushima accident)

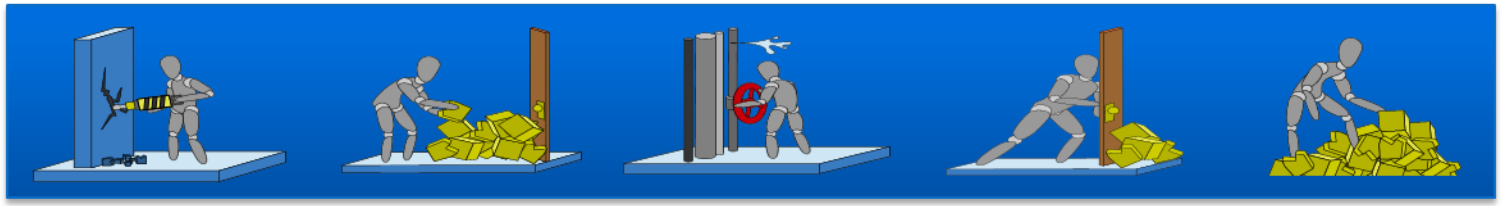
http://www.eurathlon.eu/

euRathlon/SHERPA Summer School 2015 on field robotics
Oulu, Finland, 1-5 June 2015

euRathlon 2015 Challenge,
Piombino, Italy
17-25 September 2015

WALK-MAN
Whole-body Adaptive Locomotion and Manipulation

- *To develop a robotic platform (of an anthropomorphic form) which can operate outside the laboratory space in unstructured environments and work spaces as a result of natural and man-made disasters*



EU-funded Search & Rescue projects – examples

- **SHERPA** - Smart collaboration between Humans and ground-aErial Robots for imProving rescuing activities in Alpine environments [www.sherpa-project.eu]

SMOKEBOT *- Mobile Robots with Novel Environmental Sensors for Inspection of Disaster Sites with Low Visibility [www.smokebot.eu]*

NiFti - *Natural human-robot cooperation in dynamic environments [http://www.nifti.eu/]*

Thank you!