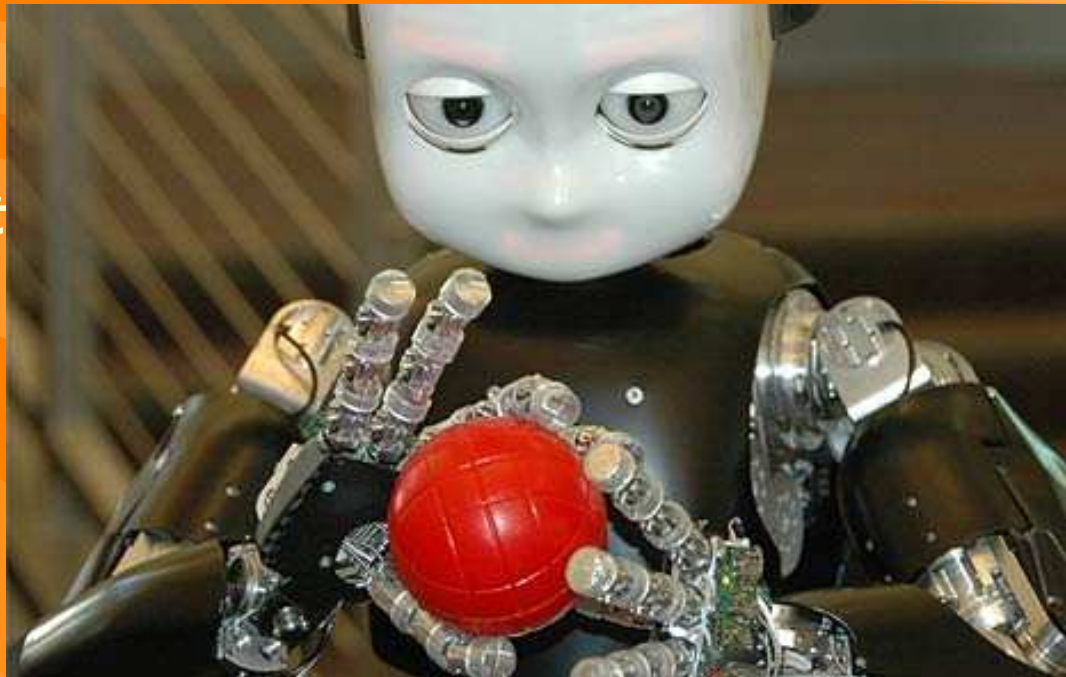


Robotics and Cognitive Systems

ICT FP7 Call 9
Information Day
Madrid, 24 January 2012

Unit


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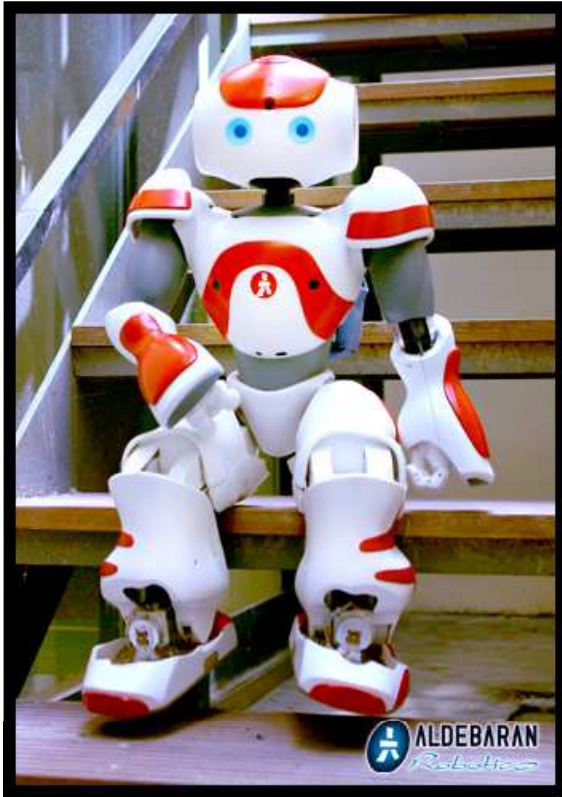


European Commission
Information Society and Media

Agenda

- Robotics and Cognitive Systems
- Program & project portfolio
- Call-9
- Some advices for success

- 
- **Robotics and Cognitive Systems**
 - Program & project portfolio
 - Call-9
 - Some advices for success



out robotics?

➤ Industrial robots

- ⊙ 2010: ± 118,000 new units sold
 - ~\$5.7 billions, +97% compared to 2009
- ⊙ World market estimated at \$17.5 billions (2011)
 - Growth estimated ~40% until 2014

➤ Professional service robots

- ⊙ Growth of 7% in 2010
- ⊙ World market estimated at \$16 billions (2011)
 - Growth estimated ~60% until 2014
 - ~90,000 units without domestic and leisure robots

➤ Domestic robots

- ⊙ ~ 4.4 million domestic service robots & 2.8 million entertainment and leisure robots up to end 2009
- ⊙ Growth of 26% in 2010
- ⊙ Growth estimated > 60% until 2015



www.shutterstock.com - 31659025



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Challenges for Europe

- ➔ Europe has a strong robotics industry with world-class research potential and technological knowledge across Europe
- ➔ Fragmentation of research: resources are not used as effectively as they could
- ➔ Saturation of classical (automotive) markets
 - ⊙ Manufacturers need to identify new application areas
 - ⊙ EUROP's (European Technology Platform for robotics) Strategic Research Agenda
- ➔ Need for closer co-operations between industry and academia

- Robotics and Cognitive Systems
- **Program & project portfolio**
- Call-9
- Some advices for success

Support from basic research to industrial RDI



Number of Projects

94

45

9

2 UPCOMING CALLS

COGNITIVE
SYSTEMS,
INTERACTION,
ROBOTICS

&

FACTORIES OF
THE FUTURE

COGNITIVE
SYSTEMS
&
ADVANCED
ROBOTICS

COGNITIVE
VISION

SMARTER, MORE COGNITIVE

- About 150 funded projects
- About 100 ongoing projects
- With about 1000 participants
- Total EU funding over 500 M€

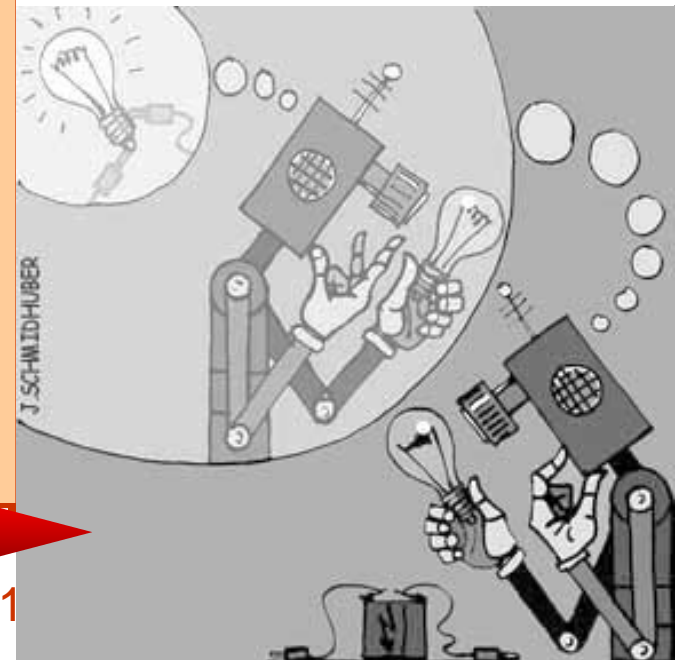


1998

2002

2006

2011



Project portfolio

**Robustness
Autonomy
Adaptivity
Flexibility
Effectiveness
Real-world...**

PERCEIVING

- Touching
- Seeing
- Hearing
- Distributed sensing
- Advanced sensing

APPLICATION AREAS

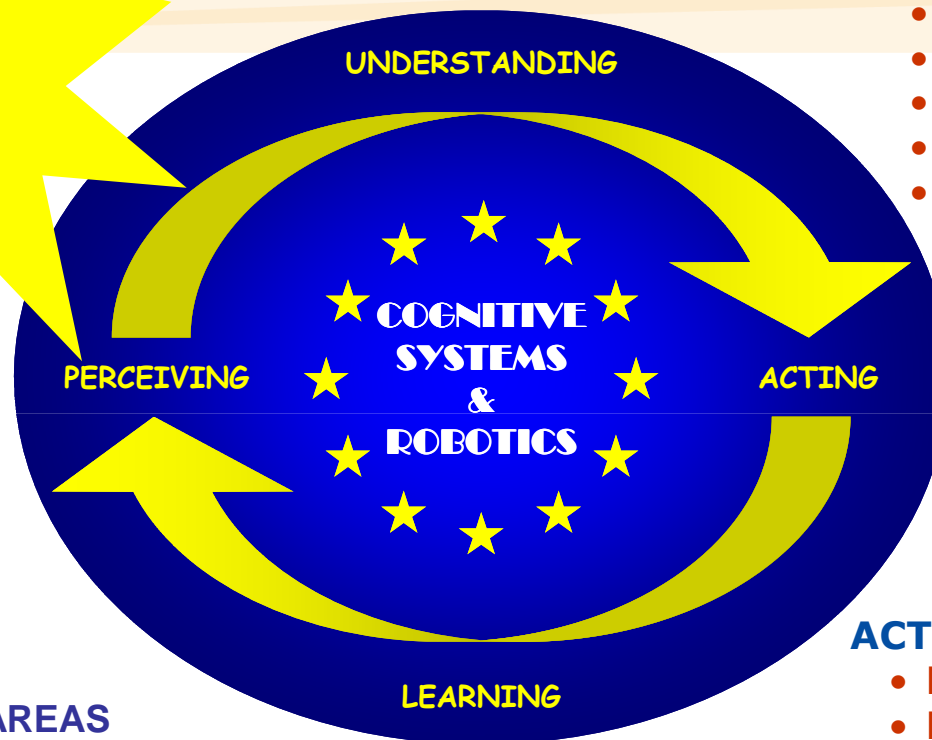
- Aerial
- Underwater
- Industry and manufacturing
- Professional and domestic services
- Medical and rehabilitation
- Monitoring and surveillance

UNDERSTANDING

- Recognising
- Interpreting
- Adapting
- Planning
- Modelling
- Cognitive architectures

ACTING

- Manipulating
- Navigating
- Interacting
- Collaborating
- Monitoring



Support to networking & community-building

- ➔ **EUROP** - European Robotics Technology Platform
 - ⊙ SRA (Strategic Research Agenda for Robotics in Europe)
- ➔ **EURON** - European RObotics research Network
 - ⊙ Network formerly funded by EC - now self-sustaining
 - ⊙ More than 230 academic and industrial groups in Europe
- ➔ **euRobotics** - European Robotics Coordination Action
 - ⊙ improvement of cooperation: industry - academia
 - ⊙ enhancement of public perception of (European) robotics.
- ➔ **EUCogIII** - European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics
 - ⊙ 800+ members
 - ⊙ Network for researchers in artificial cognitive systems
- + **Echord** - European Clearing House for Open Robotics Development
 - ⊙ Closer collaboration between robot manufacturers & research institutions

- Robotics and Cognitive Systems
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FP7 - ICT Call 9

OBJECTIVE: **2.1 Cognitive Systems and Robotics**

PUBLICATION: **18/01/2012**

DEADLINE: **17/04/2012**

INDICATIVE BUDGET: **82 M€ (80M€ (STREPS + IPs) - 2M€CAs)**

- ➔ Target (**b**) Cognition and control in complex systems - STREPs + IPs
- ➔ Target (**c**) Gearing up and accelerating cross-fertilisation between academic and industrial robotics research - IPs
- ➔ Target (**e**) Speeding up progress towards smarter robots through targeted competitions - CAs

Call 9 - Target (b): Cognition and control in complex systems (STREPs + IPs)

- ➔ Acquisition and application of **cognitive capabilities** (e.g., perception, conceptualisation, reasoning, planning)
- ➔ Enhance performance and manageability of **complex** multi-component and multi-degree-of freedom **artificial systems**
- ➔ **Synergies:** cognitive systems ↔ systems control engineering

Call 9 - Target (c): Gearing up and accelerating cross-fertilisation between academic and industrial robotics research (IPs)

- ➔ Joint industrially-relevant scenarios
- ➔ Shared research infrastructure
- ➔ Experimentation with industrial platforms
- ➔ Benchmarking

⇒ Can be inspired by ECHORD <http://www.echord.info/>

Call 9 - Target (e): Speeding up progress towards smarter robots through targeted competitions (CAs)

❖ GOAL - instrument to support science

- Not just 'nuts-and-bolts' engineering

👉 Objective Comparison of results

👉 Measure & Ensure pro

👉 Share results

👉 VISIBILITY



Call 9 - What are we looking for?

➔ Stronger industry participation

- Involving R&D departments
- Providing validation scenarios
- Providing platforms

-> Demonstrated commitment to the projects and genuine interest in the project outcome

➔ Scientific Excellence

- R&D - Target b) multidisciplinary: control/cognitive systems
- Competition - demonstrate S&T progress

➔ Increased visibility of European robotics:

- R&D - Competition - Academy ↔ Industry

Typical research questions

➔ **Continuity and progress:** the long term focus on artificial systems which are:

- ⊙ More **robust, adaptive, effective, natural**, cooperative etc
- ⊙ Dealing with **unconstrained, real world** situations

➔ **Important long-term research questions:**

- ⊙ How pro-active or **autonomous** can / should a system (esp. robot) be?
- ⊙ Can we **categorise real world behaviour** unambiguously through **sensors**? Collective vs. individual behaviour
- ⊙ How can systems **make sense of raw data streams** in environments not known to them?
- ⊙ How can we endow systems with high - level **cognitive skills such as reasoning, planning, learning and decision-making**?
- ⊙ How can systems recognise and deal with critical **safety** problems?

Broader issues

→ Technology transfer / exploitation of research results:

- ⊙ ECHORD academia to industry (robotics)
- ⊙ Benchmarking, patents,

→ Economic

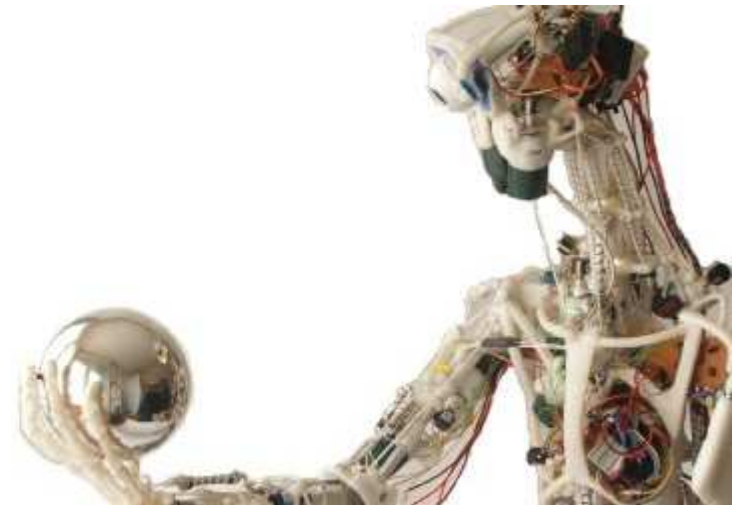
- ⊙ Market barriers
- ⊙ Cost - performance ben

→ Legal

- ⊙ Liability

→ Societal :

- ⊙ Acceptance by humans (especially as interlocutors)
- ⊙ Haves and have-nots
- ⊙ Ethical issues (e.g. vulnerable sections of society)



- Robotics and Cognitive Systems
- Program & project portfolio
- Call-9
- **Some advices for success**
(although we cannot promise it!)

What works 1

Target the **key goal of the Call**

Follow-up: explain clearly the new added-value.

Partial or full **resubmissions** of previously rejected proposals are allowed, and treated like all other (new) proposals

Ambitious yet realistic objectives

What fails

➔ Deliberately using **keywords** from the (broad) call, rather than more specific terminology in line with the specific intent

➔ Re-submission from other challenges **artificially re-shaped** for this challenge

Mere continuation of an existing project

Not taking into account comments from previous Evaluation Summary Report

Describing numerous diverse goals without clarifying how they tie together

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What works 2

Precise position with respect to the **State-of-the-Art** (literature/funded projects)

- ⊙ Where it stands
- ⊙ How it will be advanced

Justify the specificity / contribution in the “FP7 landscape”

- ⊙ Situate the proposal in reference to ongoing projects
- ⊙ Build on them
- ⊙ Identify potential synergies and/or possible cooperation
- ⊙ Identify gaps

Convincing description of **methodology**: make clear **what** you want to do and **HOW**

What fails

- ➔ Lack of discussion of SoA
- ➔ Promising something too far beyond SoA, or already done
- ➔ Proposing a large effort on literature survey within the project

Apparent “Double funding”

Insufficient description of methodology, proposals tell **WHAT** they want to do but not **HOW**

What works 3

Challenge 2 is a **scientific** challenge,
NOT an application challenge

Validation in **real-world scenarios**

- ⦿ Testing/Validation
- ⦿ Illustrate capabilities of system
- ⦿ Open to any application area

Clearly specified **success criteria**

- ⦿ Milestones/expected functionalities/benchmarks/metrics

Need for **integration** well taken into account

What fails

➔ Pure application/product development

➔ Pure theoretical projects or with only simulation/lab tests

Vague promises to solve all the open issues

Underestimated integration

What works 4

➔ Spell out the **management risks** and the **specific technological risks** in a realistic and concrete way.

➔ Provide a credible **contingency plan**.

Bring the **right partners** on board from the start

One single rule: **three** mutually independent partners from **three** different Member States or participating countries

➔ IPs don't have to be huge

➔ STREPs don't have to be small

What fails

Claiming that a research project is almost risk-free.

Artificial Add-on:

- ⊙ Industry with no clear role / added value or no clear commitment to the project
- ⊙ Attempt at "Good geographical coverage"
- ⊙ Un-manageable / inefficient IPs with large number of partners
- ⊙ Consultant for administration / finance (unless proven cost efficient)

What works 5

CVs of key PIs and references to most relevant publications

Match the human resources and management to the proposal

Creative dissemination of results

- ⊙ Potential impact for the EC
- ⊙ Use of modern media, social networks, summer schools...

Explain the expected concrete impact:

- ⊙ On S&T
- ⊙ On business & society...

What fails

- ➔ Missing CVs of key PIs or references to most relevant publications
- ➔ “Big names” without any real involvement

- ➔ Over or under-estimation of the budget
- ➔ Management too complex or too generic

Dissemination too restrictive or generic

... and finally CONSULT...

Our website : www.cognitivesystems.eu

➔ The call page

http://cordis.europa.eu/fp7/ict/cognition/calls-ict-call9_en.html

➔  The Q&A document

<http://cordis.europa.eu/fp7/ict/cognition/docs/call9faq.pdf>

➔ Projects portfolio

http://cordis.europa.eu/fp7/ict/cognition/projects/areas-projects_en.html

➔ US! (send us a short pre-proposal online)

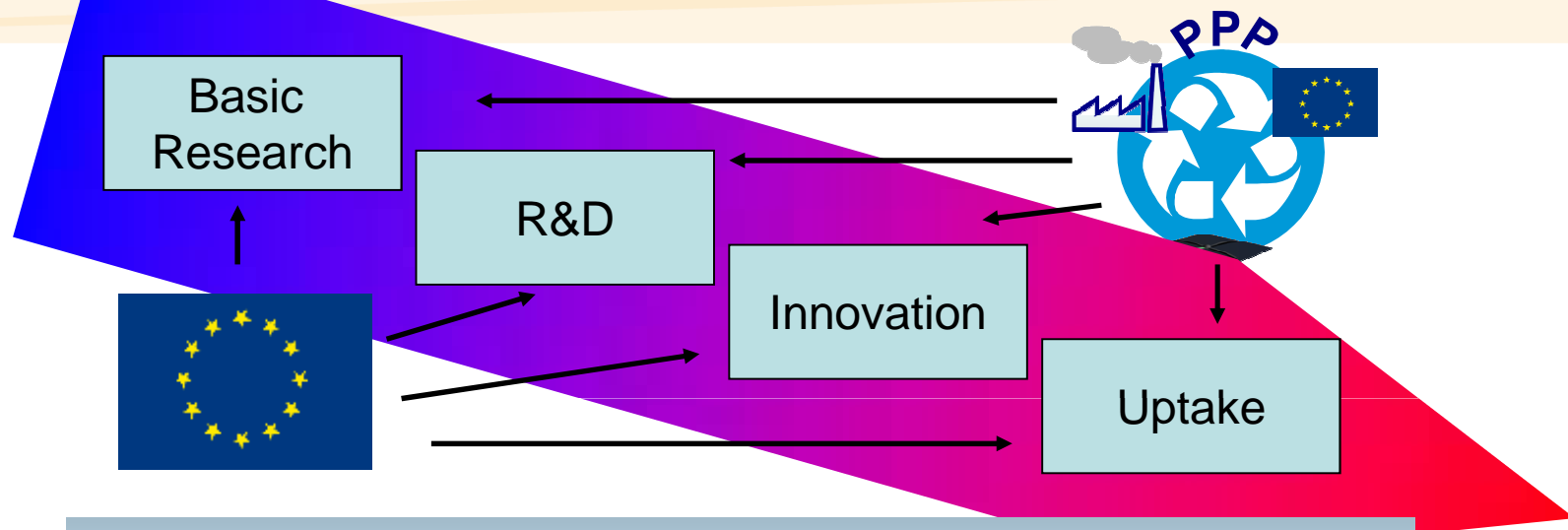


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¡Gracias!

Horizon 2020 - possible scheme for robotics (and Smart Spaces)



STANDARDISATION
REGULATION/ LEGAL ISSUES /POLICY

COMPETITIONS

ETHICAL & SOCIETAL ISSUES

CROSS-BORDER MO

INTERNATION

+ Open scheme

Open to a broad
range of ideas, open
submission

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