

# ***FP7 ICT Call 6: Cognitive Systems and Robotics***

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***<http://www.cognitivesystems.eu>***



# Previous Call for Proposals - FP7 - ICT Call 4

OBJECTIVE: **2.1 Cognitive Systems and Robotics**

PUBLICATION: **19/11/2008**      DEADLINE: **01/04/2009**

BUDGET: **73 M€**

- © New approaches towards endowing **robots** with advanced perception and action capabilities, and towards developing pertinent benchmarks and tests
- © New, scientifically grounded **system architectures** integrating communication, control, and cognitive capabilities
- © A 'Virtual Institute' integrating diverse research areas that contribute to understanding **cognitive systems** and designing useful new ones
- © Coordinated cooperation and communication within a multidisciplinary **robotics community** in Europe

# *Previous Call for Proposals (FP7 - ICT Call 4)*

## *Topics covered in retained proposals*

109 proposals will result in 19 projects:

- ◎ System architectures integrating communications, control and cognitive functions
- ◎ More natural and longer-term social interaction between humans and robotics systems; richer and more adaptive locomotion and manipulation in robots; adaptive monitoring systems.
- ◎ Perception and action capabilities for intelligent robots
- ◎ Manipulation, grasping, human-robot interaction, vision, navigation ...
- ◎ New co-ordination action supporting integration and development of the European robotics community

# Previous Call for Proposals (FP7 - ICT Call 4)

## Lessons learned

### © Most common **reasons of failure**:

- © Insufficient description of methodology (proposals tell **WHAT** they want to achieve but not **HOW**)
- © Unrealistic goals
- © Lack of discussion of state of the art
- © Underestimated **integration**
- © Missing CVs of key personnel, missing references to the most relevant publications
- © Too restrictive dissemination of results

# FP7 2009-10 (Call 4 and ICT Call 6)

## Cognitive systems and robotics

- ⊙ **Continuity and progress:** the long term focus on artificial systems which are:
  - ⊙ More **robust**
  - ⊙ More **adaptive**
  - ⊙ More **effective**
  - ⊙ More **natural**, cooperative etc
  - ⊙ Dealing with **unconstrained, real world** situations
- ⊙ **Important research questions:**
  - ⊙ How pro-active or **autonomous** can / should a robot be?
  - ⊙ Can we **categorise real world behaviour** unambiguously through **sensors**?
  - ⊙ How can a robot recognise and deal with critical **safety** problems?
  - ⊙ How can we endow robots with high - level **cognitive skills**?
  - ⊙ How can we **make sense of raw data streams** in environments not known to the sensors / robots?

# Current Call for Proposals - FP7 - ICT Call 6

OBJECTIVE: **2.1 Cognitive Systems and Robotics**

PUBLICATION: **November 24, 2009** DEADLINE: **April 13, 2010**

BUDGET: **80 M€**

- © New approaches towards understanding and solving key issues related to the engineering of **artificial cognitive systems**
- © New ways of designing and implementing **complete robotic systems**
- © A framework to facilitate **cross-fertilisation between academic and industrial** research efforts in **robotics**
- © Coordinated co-operation and communication within a multidisciplinary **artificial cognitive systems** research community in Europe



[http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.FP7DetailsCallPage&call\\_id=297](http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.FP7DetailsCallPage&call_id=297)



# ***STREP: Artificial cognitive systems***

**New approaches towards understanding and solving key issues related to the engineering of artificial cognitive systems; among these issues are the following:**

- ◎ **Object and scene understanding:** representation / categorization / recognition / interpretation of objects, events, situations, behaviours and affordances in realistically scaled real-world environments;
- ◎ The role and implementation of **memory and learning** in artificial systems;
- ◎ **Adaptive and anticipatory behaviour** within incompletely specified environments;
- ◎ **Goal-setting and strategies** for achieving goals;
- ◎ **Collective behaviour** arising from the interplay of (possibly large numbers of) individual subsystems;
- ◎ **Modelling and design** of (multimodal) interaction, communication and collaboration.

**Hint:** the above list is **non-exhaustive**. Projects are expected to demonstrate significant measurable progress on an appropriate mix of issues (the ones listed and/or others deemed relevant) that can be tackled within the constraints of a STREP.

# IP: *New ways of designing and implementing complete robotic systems*

- ⊙ Operate **largely autonomously** in loosely structured dynamic environments and, where necessary, in **close co-operation** with people.
- ⊙ May be **distributed**
- ⊙ Should integrate rich **sensory-motor skills** (for example, grasping, manipulation, locomotion) with **high level cognitive competencies** (for example, reasoning, planning and decision-making).
- ⊙ As appropriate, they should be demonstrably **more robust**, dependable, flexible and adaptive, and safer than it is possible today, and **improve their performance through learning**.

**Hint:** a complete robotic system integrates all functionalities needed to carry out a **given set of tasks** in the **chosen environment**. The environment should be **sufficiently rich**; it should provide for situations that cannot be completely specified at design time and in which a robot would nonetheless continue to operate in a sensible way.

# *IP: A framework to facilitate cross-fertilisation between academic and industrial research efforts in robotics*

- ⊙ Through widespread **experimentation with industry-strength platforms** in academic research labs
- ⊙ Through the joint definition of **longer term scenarios** and requirements to direct robotics research towards common goals
- ⊙ To assure a **comparative assessment of performance** through definition of suitable metrics and through benchmarking (supported by competitions or otherwise)

## **Hints:**

- ⊙ The proposers are expected to define and argue for **topics of relevance to both industry and academia**. Experiments are expected to use industry platforms and reflect the research needs and interests of the robotics industry as well as the research community.
- ⊙ The proposals are expected to show **support from industry** and indicate how the proposed project could secure the availability of industrial robotic platforms for the planned experiments.

# *Source of inspiration: Strategic Research Agenda for Robotics in Europe*

- © RTD **strategy** document developed by EUROP members in the CARE project (FP6)
- © **Industry-driven**, based on extensive analysis of market development and future opportunities
- © **Commitment** of all European stakeholders
- © Short-term (2010), mid-term (2015) and long-term (2020) vision
- © **Public release** in Brussels on July 7

<http://www.robotics-platform.eu>

## *SRA Extract - example of “Product Visions” Robot Assistant in Industrial Environment*

- ⊙ Robot Assistant in Industrial Environments
  - Direct interaction with the worker
  - Shared workspace without security fences
  - ...
  - The developments of the product vision over time are:

**Short term  
(2010)**

**Safe interaction  
(actively supervised);  
passively compliant  
arms (pneumatics)**

**Mid term  
(2015)**

**Intuitive interaction,  
passively compliant  
arms (mechatronics)**

**Long term  
(2020+)**

**Cognition (co-worker  
modelling); avoiding  
critical situations by  
situation assessment  
/prediction**

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## *CA: Co-ordinated co-operation and communication within a multidisciplinary artificial cognitive systems research community in Europe*

- ⊙ With concomitant outreach to potential industrial applications
- ⊙ Help create stronger cohesion among relevant communities;
- ⊙ Build awareness among wider (including non-professional) audiences of the potential of the technologies at issue
- ⊙ May also touch on ethical, socio-economic issues related to the design, deployment and operation of cognitive systems

With emphasis on practical actions such as:

- ⊙ workshops, conferences, courses,
- ⊙ training (summer schools, tutorials...)
- ⊙ networking within the research community and between the projects
- ⊙ online resources
- ⊙ and much more ...

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## Some tips...

### DO:

- ⊙ Target the **key goal** of this Call
- ⊙ Make clear **what** you want to do and **how** (your methodology)
- ⊙ Make clear the **added value** compared with **state of the art**
- ⊙ Match the **human resources** and **management** to the proposal
  - ⊙ Tip: cite references of key personnel
- ⊙ Have commensurate resource estimates
- ⊙ Explain the **expected impact**, whether on:
  - ⊙ Science and technology research
  - ⊙ Markets / applications / industry / engineering

### DO NOT:

- ⊙ Add partners just for the sake of it
- ⊙ Assume IPs or NoEs have always to be huge
- ⊙ Assume STRePs always have to be very small
- ⊙ Describe a large number of diverse goals without describing clearly how they tie together
- ⊙ Promise something too far beyond the state of the art or something already done
- ⊙ Use of keywords from the call (which are deliberately broad), rather than more specific terminology that describes your detailed intent

# FP7 - ICT Call 6 ... and finally...

## DO ALSO:

- ⊙ Consult the call page
- ⊙ Consult our website
- ⊙ Consult the Q&A document
- ⊙ Consult us (send us a short pre-proposal outline)

[INFSO-CHALLENGE-2-1@ec.europa.eu](mailto:INFSO-CHALLENGE-2-1@ec.europa.eu)

<http://www.cognitivesystems.eu>

THANK YOU!

