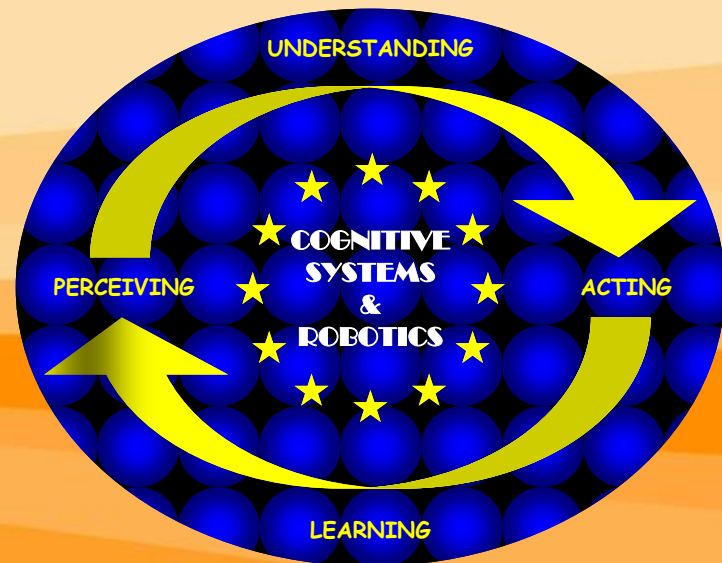


ICT Call 9/Future Internet

NCP briefing

CHALLENGE 2: COGNITIVE SYSTEMS AND ROBOTICS



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Unit E5 - Cognitive Systems, Interaction, Robotics

DG Information Society and Media

European Commission

<http://www.cognitivesystems.eu>

Outline

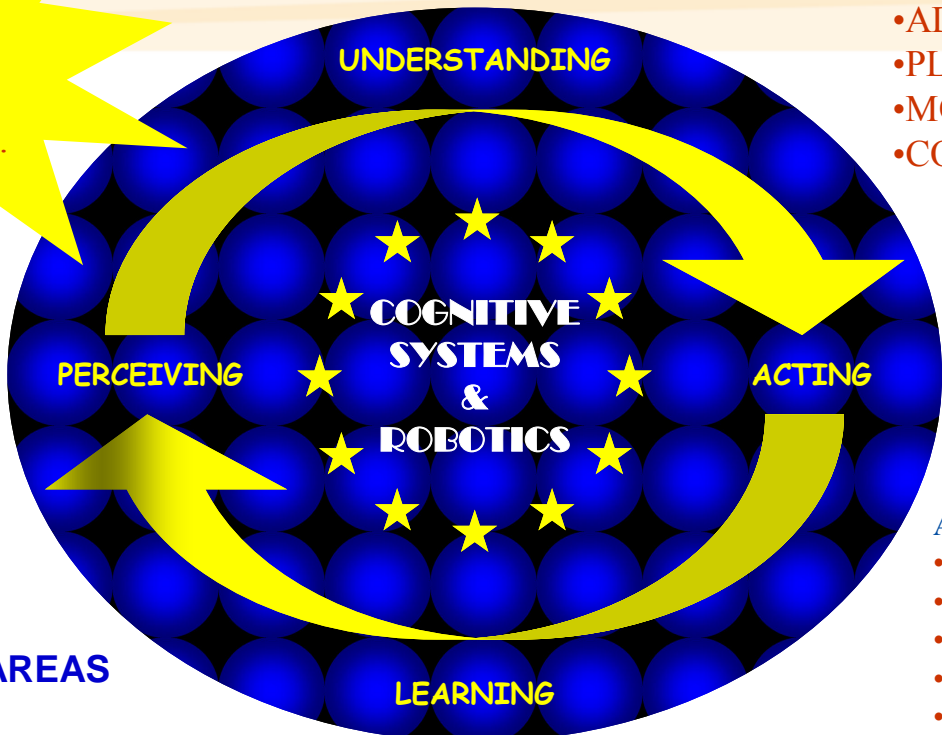
- Background
- Targets open in call9
- Answer to your questions



Cognitive Systems and Robotics: current projects portfolio (*)

ROBUSTNESS
AUTONOMY
ADAPTIVITY
REAL-WORLD,...

- PERCEIVING**
- TOUCHING
 - SEEING
 - HEARING
 - DISTRIBUTED SENSING
 - ADVANCED SENSING



- UNDERSTANDING**
- RECOGNISING
 - INTERPRETING
 - ADAPTING
 - PLANNING
 - MODELLING
 - COGNITIVE ARCHITECTURES

- ACTING**
- MANIPULATING
 - NAVIGATING
 - INTERACTING
 - COLLABORATING
 - MONITORING

APPLICATION AREAS

- AERIAL
- UNDERWATER
- INDUSTRY and MANUFACTURING
- PROFESSIONAL AND DOMESTIC SERVICES
- MEDICAL AND REHABILITATION
- MONITORING AND SURVEILLANCE



(*) http://cordis.europa.eu/fp7/ict/cognition/projects/areas-projects_en.html ●●● 3

+ classification at the end of this presentation



OUR GOAL

**IMPROVE EUROPEAN COMPETITIVENESS
AND BETTER SERVE THE COMMUNITY (research community &
European Industry)**

+ to eventually serve the European citizens

- How to demonstrate that the field is **progressing**?
- How to make **sciences meeting the industry** and **industry helping scientific** progress?
 - How to create a **snowball effect** between the offer from sciences and the needs from industry?
 - How to transfer scientific results to real life?
 - How to improve take up of research results (eg: in service robotics)?

SCIENTIFIC EXCELLENCE + STRONG COHESION R ↔ D ↔ I



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

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

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

⇒ Could be ECHORD-Like - <http://www.echord.info/>

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

- GOAL → tool to support science
 - ☞ Objective Comparison of results
 - ☞ Measure & Ensure progress
 - ☞ Share results
 - ☞ VISIBILITY
- 💣 NOT an hacking exercise

What are you looking for?

- STRONGER INDUSTRY PARTICIPATION

3 ROLES:

- Involve their R&D departments
- Provide validation scenarios
- Provide 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 – Acad ↔ Industry



What are you looking for?

AT PROJECT LEVEL - R&D projects

- Clear Objectives: ambitious/realistic
- Contribution: position wrt SoA (literature/funded projects)
- HOW: methodology
- Validation in real-world scenarios
 - Testing/Validation
 - Illustrate capabilities of system
 - Open to any application area
- Define success criteria:
 - Milestones/Metrics/Expected functionalities/capabilities

What do you *NOT* want?

- Pure theoretical projects with only simulation/lab tests
- Pure application/product development
- Double funding -> Same topic can be addressed by several projects but each has to justify its specificity/contribution
- Large effort on literature survey -> bring the right expertise on board
- Re-submission from other challenges artificially re-shaped for this challenge
- **Any ARTIFICIAL ADD-ON** - examples
 - Industry with no clear role / added value or no clear commitment to the project
 - “Good geographical coverage”
 - Huge un-manageable – inefficient IPs with large number of partners
 - Consultant for administration/finance (unless proven the most cost efficient solution)

Who are the leading players?

CATEGORIES OF ACTORS

- Large Robotics manufacturers
- Component providers/User industry
- SMEs (manufacturers, components/users)
- Excellent academic research
- Research Labs/Institutes

BUT WE WANT NEWCOMERS (e.g.: application domains not yet covered, more professional service robotics (DDD), monitoring and control, more multidisciplinary efforts such as control theory & cognitive systems,...)

Is this new or has it been called before?

- Challenge 2 called before BUT
 - New – specific Target on cognition and control in complex system
 - Specific effort Industry-Academia (constant effort but this call – specific target/mechanism)
 - Competition (New)

Is there a key group of actors or ETP driving this?

- **EUROP** the European Robotics Technology Platform <http://www.robotics-platform.eu/>
 - SRA (Strategic Research Agenda for Robotics in Europe)
- **EURON** "EUropean RObotics research Network". <http://www.euron.org/>
 - Network formerly funded by EC – now self-sustaining
 - more than 230 academic and industrial groups in Europe
 - common interest in advanced research and development to make better robots.
- **euRobotics** the European Robotics Coordination Action - <http://www.eurobotics-project.eu/cms/index.php>
 - improvement of cooperation: industry - academia
 - enhancement of public perception of (European) robotics.
- **EUCogII** - European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics - <http://www.eucognition.org/>
 - 792 members
 - network for researchers in artificial cognitive systems and related areas who want to connect to other researchers and reflect on the challenges and aims of the discipline.

Are there any additional/background documents?

- Call9 web-page: http://cordis.europa.eu/fp7/ict/cognition/calls-ict-call9_en.html
 - Pre-proposal check service
 - Presentations given at the infoday!!!

FAQ document!!!:

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

- Summary of funded projects - the results of previous Calls
- See also our projects portfolio:
http://cordis.europa.eu/fp7/ict/cognition/projects/areas-projects_en.html

ANY FURTHER HELP? Contact us

CALL 9 Challenge 2 Contact:

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Directorate-General Information Society and Media

European Commission



Call 6 + FoF mapped to SRA

FOF – CustomPacker/Tapas/Robofoot

SURGICAL ROBOT (ACTIVE – I-SUR)

LOGISTICS (RobLog)

ROBOT BUILDER (Goal-Leaders)

UNDERWATER (NOPTILUS / CoCoRo) Search& Rescue/ Unmanned (EMICAB) UAV – ML (ComPLACs)

flexible object manipulation, packaging industry, medical applications (eg prosthetic devices) (TOMSY)
Robot-arm/ML (ComPLACs)
Assembly (DARWIN/Intellact)

APPLICATION SCENARIOS	ROBOTIC WORKERS	ROBOTIC CO-WORKERS	LOGISTICS ROBOTS	ROBOTS FOR SURVEILLANCE & INTERVENTION	ROBOTS FOR EXPLORATION & INSPECTION	EDUCATION ROBOTS
SECTORS						
INDUSTRIAL						
PROFESSIONAL SERVICE						
DOMESTIC SERVICE						
SECURITY						
SPACE						

CORBYS: MOBILE MANIPULATION / eSMCS / CORBYS REHAB
Xperience: HOUSEHOLD HELPER
NeuralDynamics: HR COOPERATION TABLETOP – robotics arm

VR of Space manipulation(Intellact)

EFAA: Game/table-top
JAMES: social HRI - Bar tender
TOMSY: computer animation
SMCS: Gaming for Rehabilitation
Game Bank: Navigation support

V-Charge: autonomous valet parking eCAR

RUBICON: assisted living /transport of goods

Call 7 outcome - SRA mapping

Manipulation of deformable objects - folding/sorting clothes (CLOPEMA)
 Mobile manipulation in a restaurant (RACE)

Cognitive + Flexible robots for SMEs manufacturing (SMERobotics)

Underwater - cooperative/advanced autonomy (MORPH, PANDORA)

Aerial cooperative manipulation (ARCAS)

Assistive robotics surgery (uRALP, STIFF-FLOP)

APPLICATION SCENARIOS	ROBOTIC WORKERS	ROBOTIC CO-WORKERS	LOGISTICS ROBOTS	ROBOTS FOR SURVEILLANCE & INTERVENTION	ROBOTS FOR EXPLORATION & INSPECTION	EDUTAINMENT ROBOTS
SECTORS						
INDUSTRIAL						
PROFESSIONAL SERVICE						
DOMESTIC SERVICE						
SECURITY						
SPACE						



Outdoor guide navigation in crowded environment + social HRI (FROG)

Intelligent prosthesis (CYBERLEGS)

Object hand-over (CogLaboration)
 Compliance & Modular design (MYROBOTICS)
 Safe Physical HRI (SAPHARI)

Learning domestic tasks from web (ROBOHOW.CO)
 Understanding and carrying out everyday activity generalisation/learn action from spoken instruction/language-action link (POETICON++)



