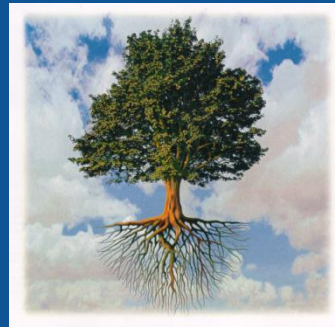




# Future and Emerging Technologies (FET) Work Programme 2014-2015 in H2020



## FETPROACT 2: 'Knowing, Doing, Being: cognition beyond problem solving'

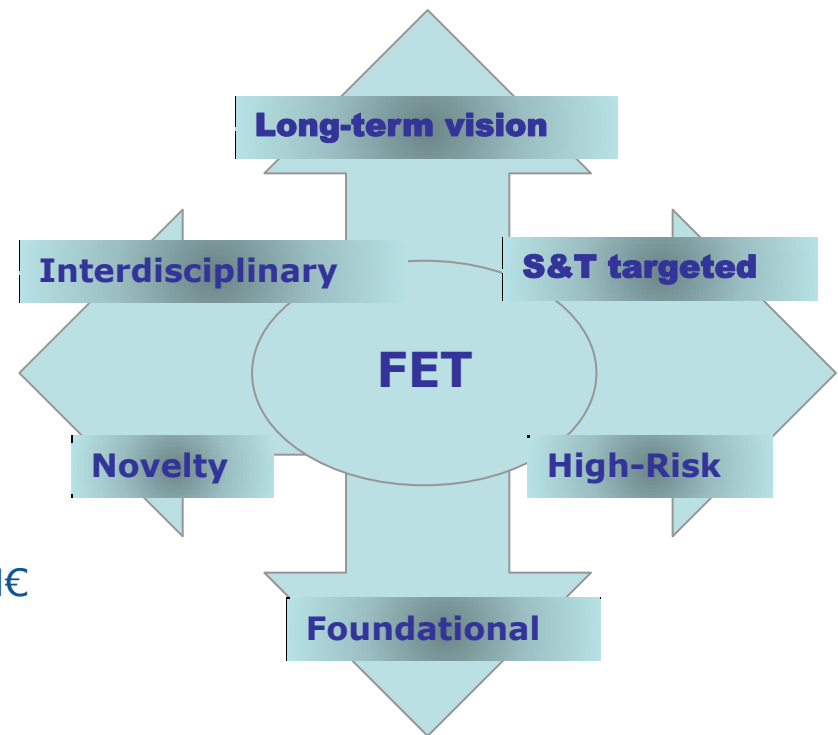
*Future and Emerging Technologies*  
DG CONNECT  
European Commission

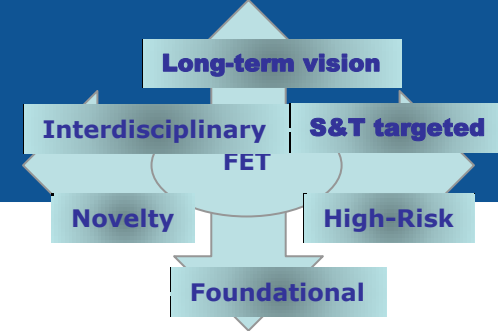
# Agenda

- FET and its proactive initiatives
- Overall characteristics of FET projects
- Three treads in this call define what's 'in' and what's 'out'
- Three subtopics
- Illustrative perspectives on each
- In practice
- Q&A

# Characteristics of FET projects

- *FET gatekeepers define the kind of research that FET is looking for*
  - Scope delimited by the 6 gatekeepers
  - Targeted - not blue sky research delimited by the call text
  - Collaborative research
- *Instrument*
  - Research and Innovation Action - 15M€





**Long-term vision:** a new, original or radical long-term vision of technology-enabled possibilities going far beyond the state of the art

**Breakthrough S&T target:** scientifically ambitious and technologically concrete breakthroughs plausibly attainable within the life-time of the project.

**Foundational:** the breakthroughs must be foundational in the sense that they can establish a basis for a new line of technology not currently anticipated.

**Novelty:** new ideas and concepts, rather than the application or incremental refinement of existing ones.

**High-risk:** the potential of a new technological direction depends on a whole range of factors that cannot be apprehended from a single disciplinary viewpoint.

- This inherent high-risk has to be countered by a strongly interdisciplinary research approach, where needed expanding well beyond the strictly technological realm.

**Interdisciplinary:** the proposed collaborations must go beyond current mainstream collaboration configurations in joint S&T research, and must aim to advance different scientific and technological disciplines together and in synergy towards a breakthrough.



## FETPROACT 2 : Knowing, doing, being: cognition beyond problem solving - 2014

*Specific challenge: This initiative addresses the interdisciplinary fundamentals of knowing, thinking, doing and being, in close synergy with foundational research on future artificial cognitive systems, robots, smart artefacts and large scale cyber-physical systems. It aims at renewing ties between the different disciplines studying knowledge (especially beyond the 'declarative' and static action oriented kind of knowledge), cognition (e.g., perception, understanding, learning, action) and related issues (e.g., embodiment, thinking, development, insight, knowledge as a social construct, identity, responsibility, culture...) from various perspectives (e.g., physical, biological, neuronal, behavioural, social, epistemological, ecological). The aim is to enable new synergies with engineering disciplines on smart and self-organising materials, embedded systems, robotics, hybrid systems or smart infrastructures and cities to take artificial cognitive systems beyond the level of dull task execution or repetitive problem solving.*

*Project size: 2 to 4M€*

*Budget & Deadline: 15M€ -> Deadline: 1/4/2014*

# Knowing, doing, being: a progression

*Disembodied intelligence (closed world AI,  
software agents)*

OUT

*Embodied intelligence (autonomous robots,  
robotic assistants, say)*

IN

*Be-ings, not do-ings*



# System 'change'-span

*Static, repetitive or limited flexibility*

OUT

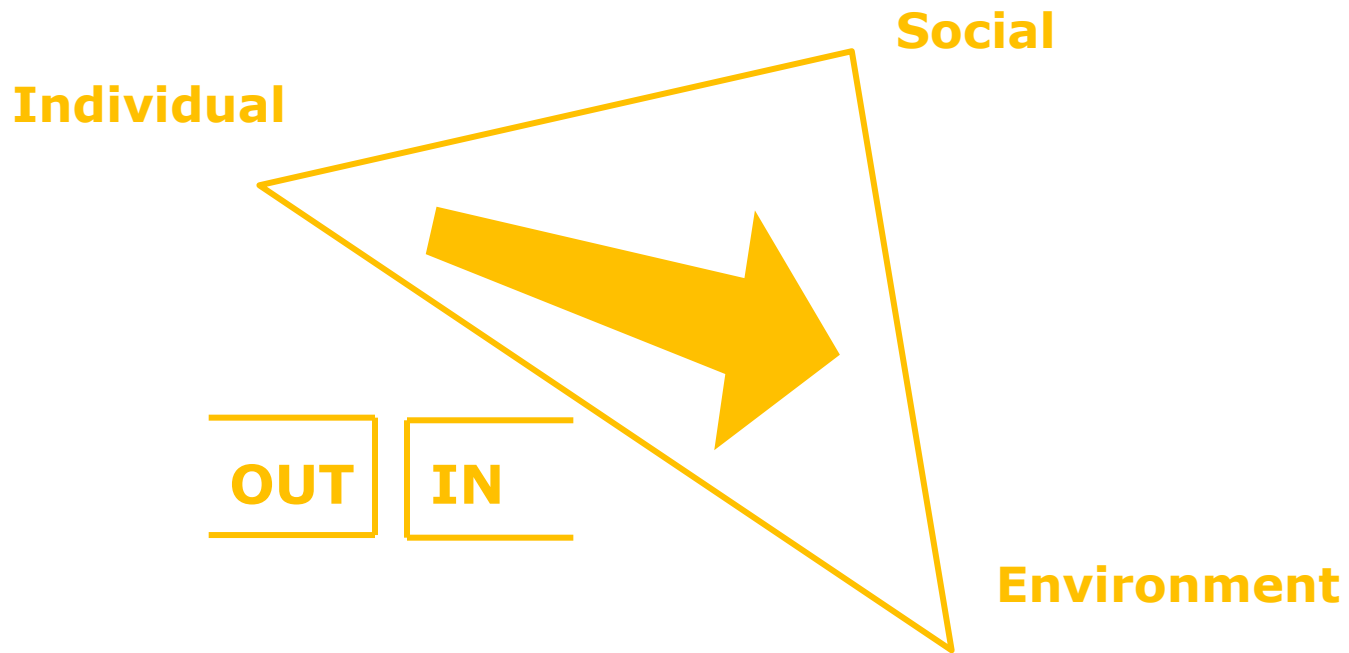
*One shot, fast learning and adaptation*

IN

*Slow, enduring change and development*



# System embedding





## Three subtopics ('at least one')

- *New concepts and paradigms, their technological implications and proof-of-concept for long time-span, open-ended viability.*
- *Integrative studies and technological approaches for understanding the 'slow' aspects of 'being'.*
- *Coupling back the long-term social and environmental embedding in technologically enhanced environments to cognition.*

Proof-of-concept

Deepening evidence

Complexity

# Subtopic 1

*New concepts and paradigms in cognitive systems such as new approaches to embodiment, learning, motivation, autonomy, knowledge and mind, not limited to prior anthropocentric or bio-mimetic models. Proposals will aim to demonstrate these paradigms in robust performance of future robotic systems (possibly nano-, micro-, multi-, hybrid- or unconventional ones) in challenging changing environments, possibly co-habited with or linked to biological systems, and over long periods of time.*

## Subtopic 2

*Integrative studies of knowing, thinking, doing and being that bridge between low-level (e.g., neuronal, physiological) and high-level (e.g., belief, intention, identity) descriptions. These multidisciplinary studies are expected to go well beyond addressing the perception-action loop, and to tackle issues such as development, experience, understanding, empathy, memory, attention, the emergence and development of self, social belonging and culture. They are to be researched in close synergy with technological experiments, for instance in computational neuroscience, intelligent materials, robotics, cyber physical settings or large scale simulations that incorporate, test and refine insights gained.*

## Subtopic 3

*Approaches for understanding the long-term development of individual and social knowledge and identities, especially in highly heterogeneous and dynamic settings (reflecting aspects of e.g., diversity, urban change, migration, social and gender divides, multiculturalism, inter-disciplinarity, etc.). Proposals are expected to take into account the role of technologies and infrastructures in this, as well as how these facilitate or hamper societal changes.*

# Some illustrative perspectives

*How some of you see this call,  
But don't feel limited by this.  
(names and bullets)*

# In practice

- *Deadline*
- *Strict page limitation*
- *Template*
- *Focus on S&T. Impact and implementation less important.*
- *Less is more: it's the idea that counts, not the coverage of everything*
- *Show that it is plausible (even if high-risk – if, if, if...) to achieve it (and what that would mean).*
- *Write for 'you' (the S&T world), not for 'us' (the Commission)*



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# Q&A