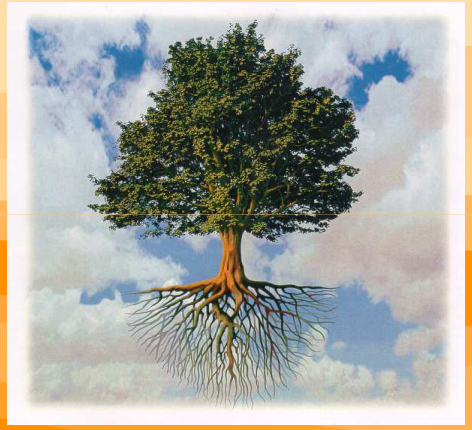
Future and Emerging Technologies
Proactive Initiatives in FP7 call 6
National Contact Point Meeting on ICT theme
Brussels 20 October 2009



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Brain Inspired ICT
Origins

- 'Beyond-the-horizon'
  - Thematic Group 4: 'Bio-ICT Synergies', (March 06)
- Topical workshops
  - 'Neuro-Information Science', (January 08).
- Public consultation, ISTAG FET group, …
- related FET proactive initiatives in FP5 and FP6:
  - Bio-inspired Intelligent Information Systems
  - Neuro-IT in FP5 (eg ALG, LPS)

Brain Inspired ICT
rationale and objectives

Rationale

The way the brain works present many advantages over current ICT systems:

- Vastly more adaptable
- Much lower power
- Fault tolerant
- …

General objective

to exploit advances in ICT and neuroscience in order:

1. **to better understand how the brain processes information and/or how it communicates with the peripheral nervous system (PNS),**
2. **to pave the way for future information technologies and potential applications including healthcare**

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Brain Inspired ICT **research topics (1)**

1. Development of multi-scale models of information processing and communication in the brain and/or PNS.
   - combining recordings/imaging of brain activity on several spatial and/or temporal scales simultaneously.
   - could address higher level cognitive processes
   - should foster joint progress and synergy in ICT and the bio- and neuro-sciences.

Brain Inspired ICT **research topics (2)**

2. Hardware Implementations of Neural Circuits that mimic information processing in the brain or PNS.
   - implementations should demonstrate either the emulation of significant functionality of a neural system or the performance of specified processing tasks.

NB. IPs should address both research topics, 1 and 2.
STREPs can address either topic 1 or topic 2.

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Expected Impact

The research should lead to:

- Improved design principles for bio-hybrid artefacts involving engineered components that directly communicate with the nervous system.
- Computational systems that emulate human skills or exploit underlying principles for new forms of general purpose computing.
- Contributions towards improved diagnosis/treatment of neurological disorders
- Experimental data archived with sufficient appropriate meta-data to facilitate re-use in another research context.

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interdisciplinarity and ethics

- The topics in this objective require close collaboration between researchers in many disciplines from both technological domains and the life-sciences.
- Proposers should carefully read the "FET Proactive Guide for Applicants" before writing a proposal.
- Particular attention should be paid to the sections dealing with ethical issues, eg if the research involves the use of animals then this should be carefully justified

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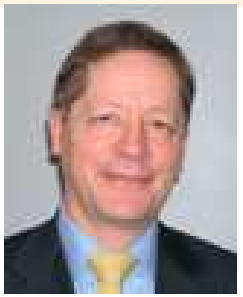
ICT-2009.8.8, Call 6



- Budget: 15 M€
- Funding schemes:
  STREPs (RT 1. or 2., >30%), IPs (RT 1. and 2., >50%)
- Contact: pekka.karp (at) ec.europa.eu
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- Background documents
  - 'Neuro-Information Science' workshop, Jan. 08
  ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/fet-proactive/nis-01_en.pdf
  - nEUro-IT.net roadmap, 2006
  http://www.neuro-it.net/pdf_dateien/Roadmapv2.0.pdf
- Web page on Cordis:
  http://cordis.europa.eu/fp7/ict/fet-proactive/brainict_en.html

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