



The 2009 virtual CSS consultation: Questions, main report findings & recommendations

COSI-ICT Cluster Workshop Brussels 25th March 2010

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Appendix I: The FET-ASSYST Questionnaire

Q1: Relation and contribution of a potential future call of CS to ICT?

Q2: What makes CS research suitable for FET ICT?

Q3: Can universal concepts in systems be expected that can be applied to/influence future ICT?

- are there steps forward in this direction worth chasing
- what's the progress in the last 10 years towards this unification?
- are there any observables that may be general?
- what (if any) are the reasons to study dynamics of CS?
- can there be a “Thermodynamics” of CS?
- what are the arguments for studying “out of equilibrium” dynamics and what is its relevance for ICT

Q4: What could be an appropriate balance between theory and application?

Q5: How do we make sure if we have a mixed call that theory (or fundamentals) are worked on?

Q6: What should be the priority application areas? On what basis are we selecting ICT relevance?

Q7: Is there value in bringing together CS with other communities, e.g. PERADA?

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Q7: Is there value in bringing together CS with other communities, e.g. PERADA?

Q8: Who are the users and how are they involved (for the research results)?

Q9: What is going to be the tangible output/impact of a call in the theory/fundamentals?

Q10: What is going to be the measure of success of the research in CS?

Main Report Findings

Q2: What makes CS research suitable for FET ICT?

CS Science is the blue sky research lab of ICT

- ICT systems fail when new parts are added.
- ICT system are not adaptive to changing environments.
- ICT systems do not self-repair.
- ICT systems - syntactic with limited success in semantics.
- Automated pattern recognition,
 e.g. machine vision, remains very limited.
- ICT systems often have poor Human-Computer Interfaces.

Q3: Can universal concepts in systems be expected that can be applied to/influence future ICT?

- are there steps forward in this direction worth chasing
- what's the progress in the last 10 years towards this unification?
- are there any observables that may be general? **10¹⁵ data !**
- what (if any) are the reasons to study dynamics of CS?

real systems are far from equilibrium !

- can there be a “Thermodynamics” of CS?

Yes !

- what are the arguments for studying “out of equilibrium” dynamics
and what is its relevance for IC

Need ICT to ‘predict: future of real systems !

Q4: What could be an appropriate balance between theory and application?

50 - 50

Q5: How do we make sure if we have a mixed call that theory (or fundamentals) are worked on?

make this part of the call

Q6: What should be the priority application areas? On what basis are we selecting ICT relevance?

Multilevel systems of systems of systems

Q7: Is there value in bringing together CS with other communities, e.g. PERADA? - Yes, we're doing it.

Q8: Who are the users and how are they involved (for the research results)?

private & public sector applications

Q9: What is going to be the tangible output/impact of a call in the theory/fundamentals?

new theory, especially

new systems that apply the theory

Q10: What is going to be the measure of success of the research in CS?

useful applications

- 1. We recommend that FET fund a new programme of work in complex systems science as essential research for progress in the development of new kinds of ICT systems.**
- 2. We have identified the dynamics of multilevel systems as the area in complex systems science requiring a major paradigm shift, beyond which significant scientific progress cannot be made.**
- 3. We propose a call requiring: fundamental research in complex systems science; new mathematical and computational formalisms to be developed; involving a large 'guinea pig' organisation; research into policy and its meta-level information dynamics; and that all research staff have interdisciplinary knowledge through an education programme.**

Very pleased to learn that there will be a call

DyM CS

Dynamics of Multilevel Complex Systems

