ECAP09

FULL EXTENDED TRACK DESCRIPTIONS

I. Philosophy of Information: **Patrick Allo**

INFORMATION
- data, information and knowledge (including semantic information and formal epistemolgy)
- logic and information
- competing concepts of information (including unified concepts and criticisms of unified concepts)
- history of the concept of information

METHODOLOGY AND APPLICATIONS
- critical investigation of the methodology of PI (including problems regarding the scope and specificity of the philosophy of information)
- informational perspectives on language, mind, and cognition (including AI-related issues and the symbol grounding problem)
- use of 'information' in the philosophy of science (including causality, problem solving and model-based reasoning)

REPRESENTATION AND ORGANISATION (excluding Ontologies)
- the representation of information (including non-linguistic information and semiotics)
- the organisation of information (including library and information sciences, information on the web, hypertext, tagging and folksonomies)

II. Philosophy of Computer Science (PSC): Raymond Turner.

Preliminary Call for Papers: http://pcs.essex.ac.uk/ecap09/cfp.html

Special issue of Minds and Machines (2010) and Track in the 7th European conf. on Computing And Philosophy—ECAP 2009

THEME

Two special editions of Minds and Machines (2007) and the Journal of Applied Logic (2008) dedicated to the philosophy of computer science have already appeared in print. Another special edition of Minds and Machines is planned for 2010. Papers submitted to the "Philosophy of Computer Science" track in ECAP 2009 will also be considered for publication in the special issue of Minds and Machines.

We invite submissions concerned with philosophical issues that arise from reflection upon the nature and practice of the academic discipline of computer science. In particular we welcome submissions concerned with questions such as the following:

1. What kinds of things are programs? Are they abstract or concrete? (Moor 1978; Colburn 2004)

2. What are the differences between programs and algorithms? (Rapaport 2005a)

3. What is a specification? And what is being specified? (Smith 1985; Turner 2005)

4. Are specifications fundamentally different from programs? (Smith 1985)

5. What is an implementation? (Rapaport 2005b)

6. What distinguishes hardware from software? Do programs exist in both physical and symbolic forms? (Moor 1978; Colburn 2004)

7. What kinds of things are digital objects? Do we need a new ontological category to house them? (Allison et al. 2005)

8. What are the objectives of the various semantic theories of programming languages? (White 2004; Turner 2007)

9. How do questions in the philosophy of programming languages relate to parallel ones in the philosophy of language? (White 2004)

10. Does the principle of modularity (e.g., Dijkstra 1968) relate to the conceptual issues of full-abstraction and compositionality?

11. What are the underlying conceptual differences between the following programming paradigms: structured, functional, logic, and object-oriented programming?

12. What are the roles of types in Computer Science? (Barandregt 1992; Pierce 2002)

13. What is the difference between operational and denotational semantics? (Turner 2007)

14. What does it mean for a program to be correct? What is the epistemological status of

correctness proofs? Are they fundamentally different from proofs in mathematics? (DeMillo et al. 1979; Smith 1985)

15. What do correctness proofs establish? (Fetzer 1988; Fetzer 1999; Colburn 2004)

16. What is abstraction in computer science? How is it related to abstraction in mathematics? (Colburn 2007; Fine 2008; Hale and Wright 2001)

17. What are formal methods? What is formal about formal methods? What is the difference between a formal method and informal one? (Bowen & Hinchey 2005; Bowen & Hinchey 1995)

18. What kind of discipline is computer science? What are the roles of mathematical modelling and experimentation? (Minsky 1970; Denning 1980; Denning 1981; Denning et al. 1989; Denning 1985; Denning 1980b; Hartmanis 1994; Hartmanis1993; Hartmanis 1981; Colburn 2004, Eden 2007)

19. Should programs be considered as scientific theories? (Rapaport 2005a)

20. How is mathematics used in computer science? Are mathematical models used in a descriptive or normative way? (White 2004; Turner 2007)

21. Does the Church-Turing thesis capture the mathematical notion of an effective or mechanical method in logic and mathematics? Does it capture the computations that can be performed by a human? Does its scope apply to physical machines? (Copeland 2004; Copeland 2007, Hodges 2006)

22. Can the notion of computational thinking withstand philosophical scrutiny? (Wing 2006)

23. What is the appropriate logic with which to reason about program correctness and termination? (Hoare 1969; Feferman 1992) How is the logic dependent upon the underlying programming language?

24. What is information? (Floridi 2004; Floridi 2005) Does this notion throw light on some of the questions listed here?

25. Why are there so many programming languages and programming paradigms? (Krishnamurthi 2003)

26. Do programming languages (and paradigms) have the nature of scientific theories? What causes a programming paradigm shift? (Kuhn 1970)

27. Does software engineering raise any philosophical issues? (Eden 2007)

REFERENCES: http://pcs.essex.ac.uk/ecap09/cfp.html

Track chair: Raymond Turner
http://www.essex.ac.uk/dces/people/profile.aspx?id=166

Information about PCS: http://plato.stanford.edu/entries/computer-science/

Important dates for Minds & Machines special issue (tentative):
*** Submission deadline: 1 Dec. 2009**
*** Notification: 1 May 2010**

III. Computer and Information Ethics: **Johnny Søraker and Alison Adam**

The track on Information and Computing Ethics deals with all ethical, meta-ethical, social, political and legal issues related to the use and development of computers and information technology.

This includes, but is in no way limited to, issues concerning privacy, intellectual property, robots, Internet governance, artificial agency, data gathering, digital divides, computer-mediated communication, professional responsibility, globalization, cybercrime and foundational issues.

We welcome contributions from not only philosophers, but also scholars of law, social science, cultural studies, media studies and other fields of applied ethics, and encourage contributions from computer professionals working on ethical issues.

IV. Computational Approaches to the Mind: Thoughts and Actions.

Area Chair:
Prof. Dr. Ruth Hagengruber
Universität Paderborn
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Warburger Str. 100
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Fon: *49-5251-602308

www.upb.de/ecap09
www.upb.de/ki09
www.hagengruber.com
https://www.uni-paderborn.de/philosophie/personal/hagengruber/

Download Flyer at http://ia-cap.org/e-cap09/materials/Flyer_CFP_2009.pdf

This track on computational approaches to the mind encompasses various types of computational reasoning, focusing on thoughts and actions.

"Computational Approaches to the Mind" are defined as thoughts and actions which are intended or able to work similarly to mental states, actions and processes in general.

The track encompasses history and philosophical foundations of AI, philosophy of mind and ontology.

We are looking for contributions on issues:

- Metaphysics in Information Science
- Possibilities, Variations, Problems of Analyzability of Mental Processes
- Constraints of Analyzability of Mental Processes
- Processing Structures
- Contributions on System thinking
- Emergent Properties

Welcome are contributions on strong and weak AI as well as to the history and philosophical foundation of AI.
Contributions on Ontology which focus on issues of ordering and taxation – in the tradition of qualitative Logic or historic contributions to Lull's logic are also welcome.

For questions or more information, please contact:
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V. IT and Cultural Diversity: **Jutta Weber, Charles Ess.**

For whom and by who are technologies developed? Who and what are made visible or invisible by the standardisations and categorisations integral to technoscientific processes and artefacts? Who participates and on what and whose terms? Who is included in the construction of technological discourses and artefacts? How do issues concerning gender, class, ethnicity, age etc. and their intersectionality matter? How is the relation between 'the' social and 'the' technical through new technologies reconfigured? And throughout these questions, how do the various practices, beliefs, norms, and worldview(s) that constitute 'culture' further interact with these agents, factors, processes, as well as the conceptual frameworks of analysis we use to respond to these questions? Do new technologies – through their design and implementation, etc. – embed and foster the cultural beliefs and worldview(s) of their designers, thereby threatening cultural diversity with a technologically-mediated cultural imperialism?

These are some of our main questions. We want to bring scholars together who are engaged in opening the black box of new technologies such as computing, AI, etc. and who want to challenge processes of normalisations. We invite research concerning culture, gender and diversity in technology/IT; critical analyses from science and technology studies, feminist/gender research, postcolonial studies and other social and cultural studies of technoscientific practices in general. We are also looking for conceptualisations and ideas with regard to possibilities for intervention, change and alternative technology design, "in the engine rooms of technological production' (Judy Wajcman).

TRACKCHAIR

Jutta Weber http://juttaweber.eu/
Charles Ess http://www.drury.edu/ess/ess.html

VI. Crossroads: David Casacuberta.

In his cult comic xkcd (www.xkcd.com) Randal Munroe imagined Whitehead and Russell working on a list to include all the possible sexual fetishes. Then they met Gödel and have the following dialogue:

> ***Russell:*** **Hey, Gödel — we're compiling a comprehensive list of fetishes. What turns you on?**
> ***Gödel:*** **Anything not on your list.**
> ***Russell:*** **Uh… hm.**

So "Crossroads" is a little bit like that, whatever doesn't fit in the other categories might be well accepted here.

Let me elaborate a little bit more on that.

"Crossroads" is devoted to interdisciplinary research in the field of information philosophy. It can be applied proposals like philosophers and graphic designers working together in order to analyze how to improve visual affordances in a genetic engineering lab. It can also be theoretical work, trying to find whether Husserlian phenomenology applies to the way autonomous robots process information.

In order to decide whether a proposal fits within "crossroads" territory we'll use the following criteria:

1) Proposals have to be interdisciplinary, implying combining knowledge, data and methodologies from two or more disciplines. Papers focuses in questions related to just one discipline should find other category that fits best to them.

2) Proposals should be able to generate further discussion, present bold ideas, finding unexpected ways to connect concepts. We prefer that to very accurate models tracking a very specific problem, as they will probably fit better in other categories.

3) Proposals coming from interdisciplinary teams are greatly appreciated. However, if an author is good enough and can master a couple of disciplines well enough to produce interesting resultst that would be more than fine too.

4) Both applied projects as well as speculative proposals are accepted.

5) Because proposals are going to combine knowledge from different disciplines, it is expected from authors to present this knowlege in a way that people not into that discipline can however follow arguments and proposals.

VII. Robotics, AI & Ambient Intelligence: Thomas Roth-Berghofer

Track chair: Thomas Roth-Berghofer, German Research Center for Artificial Intelligence DFKI, GmbH, Kaiserslautern, Germany, http://thomas.roth-berghofer.de

In line with the general E-CAP conference theme - computing and philosophy - this track is open to contributions from all disciplines, but has a particular focus on robotics, artificial intelligence and ambient intelligence.

Possible topics include (but are by no means limited to):

- The role of artificial intelligence in ambient intelligence

- The role of ambient intelligence in robotics

- Semantics and knowledge representation for embodied agents

- Phenomenology, tacit and implicit knowledge

- Individualisation of knowledge in ambient intelligence and robotics

- Human interactions with robots

- Explanation generation and ambient intelligence

- Applications of ambient intelligence

- Capabilities ("Fertigkeiten") vs. abilitities ("Fähigkeiten")

- Epistemology and ambient intelligence / robotics

VII. Biocomputing, Evolutionary and Complex Systems: Gordana Dodig-Crnkovic & Søren Brier

Gordana Dodig-Crnkovic http://www.idt.mdh.se/personal/gdc
Søren Brier http://www.brier.dk/SoerenBrier/index.htm

Track description

Bio-inspired computing is a branch of *natural computing* which studies complex problems using computational methods informed by design principles of living nature. We can learn a great deal by observing nature and adopting biological approaches to problem solving. Biological organisms cope with the demands of their environments by adaptation, self-organization, self-configuration (auto-configuration), self-optimization, self-healing, context-awareness, learning etc.

Organic Computing has emerged as a vision of future information processing systems, as a result of large and constantly increasing numbers of autonomous information processing systems, equipped with sensors and actuators, aware of their environment, communicating, and organizing themselves in order to perform actions and services. In such systems complexity is a main problem and a solution is found in organic systems. *Autonomy-oriented computation* paradigm uses artificial systems imitating collective behavior of social animals (such as ant colony optimization) to solve hard computational problems. Biological methods and systems found in nature are also used in the study and design of engineering systems in Bionics (biomimetics, biognosis, biomimicry, or bionical engineering).

The goal of new computational methods is to produce information processing tools with enhanced robustness, scalability, flexibility and which can interface more effectively with humans. Bio-inspired computing is based on Biology, Computer Science, Informatics, Cognitive Science, and robotics, and similar fields.

We aim at philosophical reflection over the state of the art of the research in the Bio-inspired computing, Evolutionary and complex systems including (but not limited to) the following:

- Organic computing;
- Dynamic aspects in terms of emergence and evolution of norms or organization;
- Adaptivity, reconfigurability, emergence of new properties, and self-organization;
- Autonomic Computing;
- The problem of growing complexity and its solutions by autonomic and biocomputing;
- Bio-inspired computing and AI;
- Bio-inspired computing and robotics;
- Bionics;

- Biocybernetics;
- Biosemiotics;
- Bio-cognition;
- Evolutionary robotics;
- Biocomplexity;
- Computational aspects of complexity and emergence;
- Relation between cognition and communication in biological systems;
- Networks of living agents, intersubjectivity;
- Ideal functioning of living systems and possibility of computational cognitive aids/enhancements;
- Limits of computational approaches to living organisms, including humans.

VIII. E-learning, E-science and Computer-Supported Cooperative Work: **Annamaria Carusi**

This track will consider a wide range of computational, information and communication technologies for conducting scholarly research; for learning, and for work.

Typical technologies include Cyber-infrastructures; Virtual Research Envirnoments; Virtual Learning Environments; Virtual Worlds/ Second Life; Grid Technologies; Cloud Technologies; Web 2.0 / 3.0; Semantic Web; Social Semantic Web. Computational technologies for conducting research across the sciences, social sciences and humanities include tools for text mining, annotation, automaticed analysis, simulation, visualisation and many others. Access to people and institutions is as important as access to information and tools, and there are several infrastructural and communicational tools geared specifically to facilitating inter-personal and inter-institutional communication, including Access Grid, but currently also a huge number of Web 2.0 technologies geared towards the formation of groups or communities.

Papers on all aspects of the relation between knowledge and computational technologies are:

- How is knowledge mediated, constructed or constituted through the computational technologies used for e-science ?
- What is the nature of knowledge in computational domains? What are data and information in learning, research, working contexts mediated by computational means?
- What is the nature of community, groups and collaboration?
- How is the knowing/learning/professional subject positioned, constituted or constructed through these technologies?
- Is the relationship between professional and amateur being reconfigured?
- How are research domains being reshaped by these technologies?
- How are the differences between knowing that and knowing how, between explicit and tacit knowledge, etc. played out in these computational domains?
- What is the role of trust and how does trust emerge in e-science, e-learning and cscw?
- Are e-mediated routes to knowledge and learning the way to open science, democracy and transparency?
- In what way do institutions and power make themselves felt through cyber-infrastructures?
- What is the role of the different media and forms of content available through, for example, Web 2.0 technologies?
- What is the epistemological nature of computational simulations and / or visualisations? Are they something entirely different, requiring a new epistemology? Are they akin to thought experiments? What is their relationship to what they simulate?
- How are the new technologies for conducting scientific and social scientific research reconfiguring the relationship between quantitative and qualitative research methodologies?

- What are the ethical, social and political implications of e-social science?

And lastly, but very importantly for us:

what do the e-science and e-learning methodologies mean for the teaching and doing of philosophy?

IX. Technological Singularity and Acceleration Studies: **Amnon Eden**

Track chair: Amnon H. Eden, School of Computer Science and Electronic Engineering, University of Essex, UK and Center For Inquiry, Amherst NY

Papers submitted to the TECHNOLOGICAL SINGULARITY AND ACCELERATION STUDIES track in ECAP 2009 will also be considered for publication in a special issue of Technological Forecasting and Social Change (Elsevier).

THEME

Historical analysis of broad range of paradigm shifts in science, biology, history, and technology--in particular in computing technology--suggests an accelerating rate of progress. This observation has led Ray Kurzweil to attempt to unify the predictive power of biological evolution, cultural evolution, and technological evolution under the Law of Accelerating Returns, a hypothesis which can be taken to be a generalization of Moore's Law (the cost/performance of computing machines doubles every 18-12 months).

Amongst the most important consequences of this law is the notion of Technological Singularity, which was described in 1950 by John von Neumann as an "essential singularity in the history of the race beyond which human affairs as we know them could not continue". Expected to take place by the middle of the 21st century, this notion of Singularity coincides in time and nature with Alan Turing (1950) and Stephen Hawking's (1998) expectation of machines to exhibit intelligence on a par with to the average human. John Irving Good (1965) and Vernor Vinge (1993) expect it to take the form of an 'intelligence explosion': the process by which ultraintelligent machines design ever more intelligent machines. Transhumanists suggest a parallel process of explosive progress in human intelligence and physique emanating from the enhancing humans with silicon-based computers and prostheses. Many refer to projected progress in robotics, nanotechnology, and genetic engineering, amongst others, to determine the nature of the Technological Singularity. Unfortunately, the very term 'Singularity' also suggests the presence of an 'event horizon', an epistemological barrier on our ability to understand the events that may follow it.

We invite abstracts examining the following issues from a philosophical, mathematical, scientific, computational, and technical points of view:

1. Empirical assessments of the Law of Accelerating Returns
2. Estimating the reliability of a technological forecasts
3. Historical analysis of the Law of Accelerating Returns
4. The impact of acceleration on science and society by 2050
5. Hazards of technological acceleration and preventative measures
6. The nature of the Technological Singularity
7. The nature of an intelligence explosion
8. Beyond the 'event horizon' of the Technological Singularity

Papers submitted to the TECHNOLOGICAL SINGULARITY AND ACCELERATION STUDIES track in ECAP 2009 will also be considered for publication in a special issue of Technological Forecasting and Social Change (Elsevier).