What is Philosophy of Computer Science?
Experience from the Swedish National Course

Gordana Dodig-Crnkovic

Mälardalen University,

Department of Computer Science and Electronics

gordana.dodig-crnkovic@mdh.se

Abstract. This article presents experience from the Swedish National Course in Philosophy of Computer Science held at MDH University during 2004. Participants from a number of Swedish universities attended this cross-disciplinary course, organized for the first time, with the aim of introducing the research field of Computing Philosophy in Sweden.

The paper describes the organization of a PI - network which discussed the definition of the field of Philosophy of Computer Science (PCS) as well as its relations to Philosophy of Computing / Philosophy of Information, and selected suitable topics to be presented and discussed in the course.

The course consisted of lectures given by specialists within different fields of philosophy and computing, class discussions and the writing of individual research papers. The subjects of the lectures included philosophical issues such as the fundamental nature of computation, the methodology of Computer Science, the scientific ideal of the physical sciences, modeling and simulation issues and ethical, societal and artistic aspects of computing.

The course addressed the conceptual foundations of Philosophy of Computing / Philosophy of Information, examining critically the concept of computing, its models and metaphors, from data types to programming languages, programs to processes, and from architecture to abstraction. The use of the computational paradigm in related fields was explored in several parts of the course.

The results of the course included ten papers which have been published in journals and conference proceedings or are included as chapters in PhD theses. We hope to see the network activity and the course develop in the future, possibly as a distance course, in collaboration with colleagues in other countries. This will certainly broaden our experience and allow us to identify further relevant topics to be included in PCS.

Description of the Course

The project began with the initiation of the PI-network, (Philosophy of Computing and Informatics network) during 2003. Supported by KKS, (the Knowledge Foundation), its purpose was to prepare the Swedish National Course in Philosophy of Computer Science.

The Course in Philosophy of Computer Science was presented during the period January – May 2004, with the following syllabus.

I. PHILOSOPHICAL FOUNDATIONS

Introductory lecture: What is PI?,
Luciano Floridi, Oxford University

Physics as a traditional model of the ideal science for Philosophy of Science,
Lars-Göran Johansson, Uppsala University

Philosophical Foundations of Computation, Gordana Dodig-Crnkovic, MDH

II. METHODOLOGY, MODELING AND SIMULATION

Methodological Foundations of Computer Science, Erik Sandewall, Linköping University
Methodological and Philosophical Aspects of Modeling , Kimmo Eriksson, MDH, and Lars-Göran Johansson, Uppsala University
Critical Analysis of Computer Science Methodology, Björn Lisper, Jan Gustafsson, MDH

III ETHICAL AND SOCIETAL ASPECTS

Ethics, Professional Issues, Gordana Dodig-Crnkovic, MDH
Computers in Society - Culture and Art, Gordana Dodig-Crnkovic, MDH
AI and Ethics, Peter Funk

IV MINI CONFERENCE - Presentations of research papers written by course participants.

More information about the course may be found at http://www.idt.mdh.se/personal/gdc/PI_04/index.html

Discussion of the Course Content and what PCS is/might be

The discussions within PI-network about the course content were based on the books in the list of references, along with the web resources that may be found in the Virtual Library web page of the course, http://www.idt.mdh.se/~gdc/PI-network-library.htm

In this part of the paper we will present the details of the arguments about the definition of PCS.

Conclusions

One of the aims of the PI-network, (Philosophy of Computing and Informatics network) was to organize the Swedish National Course in Philosophy of Computer Science, with funding from KKS (the Knowledge Foundation). Participants from different universities (Blekinge, Dalarna, Mälardalen, Skövde, Uppsala) have taken part in the course and have presented their research papers at the Mini-conference. These have been documented in the Course Proceedings, http://www.idt.mdh.se/personal/gdc/PI_04/proceedings.pdf

The course demonstrated how PCS may be taught to different student groups with heterogeneous backgrounds and brought to light the questions course participants found most relevant in connection to their own research fields. It was found that philosophical foundations and methodology, modeling and simulation are of most interest. The publication, in conference proceedings and journals and as PhD thesis chapters, of ten papers related to the course, confirms the value of the course and its impact on related research fields.

We hope to see the network activity and the course develop in the future, possibly as a distance course, in collaboration with colleagues in other countries. This will certainly broaden our experience and allow us to identify further relevant topics to be included in PCS.

References

T W Bynum and J H Moor, *The Digital Phoenix: How Computers are Changing Philosophy*, (1998)

L Floridi, *Philosophy and Computing: an Introduction*, (1999)

T R. Colburn, *Philosophy and Computer Science*, (1999)

J H. Moor and T W Bynum, Cyberphilosophy: The Intersection of Philosophy and Computing, (2003)

L Floridi (Editor), Blackwell Guide to the Philosophy of Computing and Information, (2003)

The list of published articles, written in connection with the PI course

1. Rikard Land, *Understanding Evolution of Information Systems by Applying the General Definition of Information*, Proceedings of 26th International Conference on Information Technology Interfaces (ITI), Cavtat, Croatia- IEEE, June 2004
2. Sandra Ijeoma Irobi, *Correctness Criteria for Models' Validation - A Philosophical Perspective* Proc. Models, Simulations and Visualization International Conference (MSV'04)], Las Vegas, Nevada, United States.
3. Imad Eldin Ali Abugessaisa, *Ontological Approach for Modeling Information Systems,* Proceedings of The 4th International Conference on Computer and Information Technology Wuhan, China, 2004 and will be published as IEEE CS.
4. Baran Çürüklü, *Early Stages of Vision Might Explain Data to Information Transformation,* Proceedings of the Engineering Of Intelligent Systems (EIS 2004), Madeira, Portugal, 2004
5. Christina Björkman, *Crossing Boundaries, Focusing Foundations, Trying Translations: Feminist Technoscience Strategies in Computer Science*, BTH, Dissertation Series No 2005:02, 2005, (A PhD thesis chapter)
6. Gordana Dodig-Crnkovic, Virginia Horniak, *Togetherness and Respect - Ethical Concerns of Privacy in Global Web Societies*, Special Issue of AI & Society: The Journal of Human-Centred Systems and Machine Intelligence, on "Collaborative Distance Activities: From Social Cognition to Electronic Togetherness", CT. Schmidt Ed., Vol 20 n°3, 2006 (includes elements of Virginia's article).
7. Christina Björkman, *Invitation to Dialogue: Feminist Research meets Computer Science*, in Jacqueline Archibald et al (eds) The Gender Politics of ICT, Middlesex University Press, July 2005
8. Christina Björkman,"*Feminist Research and Computer Science: Starting a Dialogue*", in Journal of Information, Communication and Ethics in Society (ICES), vol 3, nr 4., 2005
9. Carina Andersson, R. Pettersson, *How can a Design process and Scientific process in Information Design collaborate?* Published in R. Rohatynski & J. Jakubowski (Eds.) Engineering Design in Integrated Product Development EDIProD 2004, Polish Academy of Science, Committee of Mechanical Engineering, 2004
10. Pettersson, R., Andersson, C., & Olsson, B. *Philosophy of Information Design Research Methods.* Presented at the 3rd CEPHAD-conference (The Centre for European Philosophy, Art, and Design). March 16th, 2004, Bornholm, Denmark. (2004), PhD thesis chapter.