

GORDANA DODIG-CRNKOVIC

PhD Physics, PhD Computer Science

Chalmers University of Technology & University of Gothenburg

Department of Computer Science and Engineering,
Division of Interaction Design

Mälardalen University

School of Innovation, Design and Engineering
Division of Computer Science and Software Engineering

PEDAGOGIC PORTFOLIO

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(Nomenclature established in 2006-2007 had levels: 1. Behörig/Qualified 2. Etablerad/Established 3. Meriterad/Meritorious lärare/teacher. From 2008-2014 three levels have been renamed to

1. Behörig/Qualified 2. Meriterad/Meritorious 3. Exellent/ Excellent lärare/teacher. After 2014 only two levels are given: Meriterad/Meritorious and Exellent/ Excellent lärare/teacher. Important to know that back in 2007 Meriterad lärare was the highest level of three possible, corresponding to professor.)

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I. PEDAGOGIC PHILOSOPHY

Fundamental Stance

“Act in such a way that you treat humanity, whether in your own person or in the person of any other, always at the same time as an end and never simply as a means”.

Immanuel Kant, Second formulation of the categorical imperative, Stanford Encyclopedia

Kant's maxim summarizes the most important aim of my teaching as well as my research – it is human-centered which for my teaching means that the student (and not an abstract goal) is in the center of the educational process.

My ideal is humanist holism, which on an individual level helps understanding the world, and on a group level facilitates interaction between people with different backgrounds. The concrete consequence of this holistic view is that I firmly believe in the need for the students of sciences and technologies to learn about “soft” subjects like ethics and the societal aspects of their profession. Similarly, it is essential for students of liberal arts and humanities to learn about “hard” sciences and technology in order to get state of the art knowledge of the physical world including technical artifacts provided by science and technology. It is of utmost importance to facilitate communication between those two academic worlds and to make possible sharing of common knowledge, and engage all the available potentials in building of the nascent humanist knowledge society. In all of my teaching, values are the basis of the course. I insist on answering not only the question “how?” which in itself is the focus and the most relevant question in many technical and mathematical courses, but also try to discuss the question “why?” (Aristotle, Ethics)

Typical of my teaching is an interdisciplinary and global view. I want my students to feel they are citizens of the world, to create and share their knowledge to benefit humanity. It is becoming increasingly important with the current trend of internationalization of the university. We have new students from abroad, coming from different cultures and it is important for me to create a “world citizen” feeling in my class – that all of the participants feel regardless of their cultural, religious or school background.

In the holistic approach teaching and research are naturally connected. It is the interconnectedness of teaching and research that lies at the heart of the definition of a ‘university’ and informs the professional identity of university teaching. My experience is that nothing makes people more enthusiastic and engaged than the feeling that they are sharing the best and most up-to-date knowledge, and that they can also contribute to its development.

“Truth is a thing of this world: it is produced only by virtue of multiple forms of constraint. And it induces regular forms of power... it is produced and transmitted under the control, dominant if not exclusive, of a few great political and economic apparatuses (university, army, writing, media); finally it is the issue of a whole political debate and social confrontation ('ideological' struggles)”.

Michel Foucault (1980)

As Foucault pointed out, knowledge generation and its institutions are power mediators and the educational system is a social structure for mediating power. Power of logical and scientific argument is a good thing, but the institutional power which certain positions (such as professor) traditionally have, must be handled with great care.

Important for my relationship with my students is the feeling of collegiality.^[1] Not so long ago, starting my third career within computing, I had an opportunity to experience anew how it feels to sit in a bench as an ordinary student. From that perspective one sees very well the power structure of the educational system represented by the teacher with the right answer ("facit") in his/her hand. I do really hope that I will never become an authoritarian and arrogant teacher who looks at the student from above. My deepest conviction is that learning should happen in a friendly atmosphere of sincere mutual respect and without elements of aggression, threat and humiliation. As a pedagogue I have a humble attitude towards both my own and my students' ignorance. It is good to keep in mind that all our "absolute truths" will become obsolete, too narrow or insufficiently well defined in the future. From thinking in terms of power structures of the educational system comes my active engagement in gender and equality questions. I have introduced different strategies to assure both female and male students good results in the course Formal languages, automata and theory of computation, which is basically a mathematical course, in which female students traditionally showed systematically lower results^[2] I also have gender aspects in my courses in Vetenskapsmetodik (Theory of Science), Information - kunskap - vetenskap - etik (Information – Knowledge – Science – Ethics) and Professional Ethics.

At the department, I have been active in the planning and execution of the "Gender pedagogical project" addressing the problem of low female representation and gender related issues in computer science and technology (Björkman, 1999) (Bondestam, 2005), (Noddings, 1984) - led by Christina Björkman, see Appendix B. I was a member of the MDH jury that every year selected the best diploma work with respect to gender issues. This gave me an insight in the current diploma work production with its methodological and quality aspects, as well as an opportunity to encourage positive developments towards gender equity.

In recent years I developed strong engagement in environmental issues and digitalization effects on university education, mostly reflected in the course Research Ethics and Sustainable Development, a compulsory course for all PhD students at Chalmers that I am responsible and which I am continually developing.

^[1] Colleagues are those explicitly united in a common purpose and respecting each others' abilities to work toward that purpose.

^[2] Based on the observation that females as a minority in the course were marginalized and never took part in sharing of solutions to the problems and other important information in the class, I introduced "räknestugor" - lectures in problem-solving, where mixed-sex groups were given exercises with the support of teaching assistant. In that way information was evenly distributed in the group, and female students subsequently showed performance results equal to those of their male colleagues

Understanding of Learning as a Process

“The world is unfinished.”

Paulo Freire, *Pedagogy of Freedom – Ethics, Democracy, and Civic Courage*

For me education is a continuously developing field, in the same way as science is always improving and scientific knowledge always growing. The absolute state of ideal education is not only unattainable, but also impossible, and what's more – undesirable! There is always place for everybody to both learn about what is known today and to contribute to the future knowledge. We are continuously re-constructing the world we live in, and I like the idea that all of us have a part in sustaining the existing knowledge and adding our own interpretations and experiences.

As an educator I have a pragmatic view and adopt a combination of different theories of learning. I rely on cognitive theories (especially on Thagard) as well as constructivist developmental theories of Piaget (1960) and Vygotsky (1997). Even some of the elements of behaviorism are still usable in practice exercises based on the principle of positive reinforcement when applied in labs and learning math problem solving techniques.

Piaget and Vygotsky claim that learning takes place through storage and structuring of information. Their view is very close to my own research approach in information semantics. Contemporary theorists suggest that learning is a process where knowledge is constructed both individually and socially with learners actively engaged in a process of integrating new experiences and information with existing concepts and practices. In that way the pre-existing knowledge, skills, beliefs and concepts influence how learners conceptualize the world and how they interpret and organize it. Research shows that education is most effective when used to enhance constructivist strategies because they support interactivity, learner control and student engagement. (Vygotsky, Piaget, Thagard, Bransford et al.)

In short, I agree with Cranton and Carusetta (2002, p169) who define teaching as “a specialized form of communication with the goal of fostering student learning”. In addition to its communicative nature they emphasize that teaching is constructed socially within a specific context and is acquired by “experience, reflection and discourse” (p169). In my view, the teacher plays a decisive role as a catalyst in that dynamic process of knowledge construction as (s)he provides support, motivation and shares the enthusiasm with the students. Emotional setting is a very important factor that influences rational acting, and also our learning, as Thagard clearly shows.

II. DEVELOPMENT OF STUDENTS LEARNING

Goals

My goal as a pedagogue is not just promoting students learning of the subject and developing their technical skills. I am also training students to think critically (which implies using logic and understanding of context), help them learn problem-solving strategies and techniques, and improve writing and argumentation skills. In addition, I encourage students to see the course material in a holistic way by encouraging them to integrate various concepts of the course by applying them in a range of contexts. Those critical thinking and expressive skills will be valuable in the student's future life, both as an individual and as a professional. (Jørgensen Winther & Phillips, 2000), (Freire, 1998), (Bransford, Brown & Cocking, 2000)

One of the most difficult skills to teach, but also a very important one to be aware of when thinking of student's future use of their knowledge in practice, is the ability to make the right judgment in a concrete situation.

"Judgment is the faculty of subsuming under rules; that is, of distinguishing whether something does or does not stand under a given rule . . . judgment is a peculiar talent which can be practiced only, and cannot be taught . . . [an individual] may comprehend the universal in abstracto, and yet not be able to distinguish whether a case in concreto comes under it."

Immanuel Kant, Critique of Pure Reason.

Judgment is difficult to teach because it is a result of practice in a concrete context, but what one can learn as a student is to be aware of the crucial importance of judgment, its relationship to abstract knowledge and its essential dependence on the context. If one is to connect all "school knowledge" with the "real life" problems, one needs the ability to make correct judgments.

Methods

In my teaching I use different approaches, dependent on subject (course) and class. In my Formal languages, automata and theory of computation course I use the positive reinforcement approach by encouraging and confirming the proper handling of a problem. Those classes deal with mathematical problems and are for second year students, who need a lot of support and encouragement. In other subjects, such as Ethics, Theory of Science and Research Methodology I often use the Socratic Method where the dialogue with the student leads to her/his own insights in the subject under discussion. The character of the subject and the maturity of the students determine which pedagogical approach will be the most suitable one. Here are examples of some of the methods and tools I apply.

In-class activities. I try to begin each class with a brief summary of the previous class session, and a reminder of where we are in the topic we are currently working on. I usually begin the lecture with a brief outline and a list of objectives. I encourage questions and take time to answer them. In graduate classes I often incorporate class discussion into the lecture. As much as possible, I try to present course material in different contexts.

Co-operative learning. In the past years, I have incorporated more cooperative learning techniques into the class sessions. These usually involve working in pairs or groups on a

specific topic. In Formal languages, automata and theory of computation course we had bigger groups (usually 5-6 students) who worked together on problem solving, and two-student groups in the labs. Seminars in Theory of Science, Research Methodology and Ethics are usually done in groups of two students. Peer review process exercised in groups was part of the Research Methodology course as well as Chalmers course Research Ethics and Sustainable Development. In several courses seminars, or mini-conferences are used for presentations of final course results. Collaborative work has several purposes – in the first place to contribute to better learning of the subject matter, critically discussing, sharing and communicating knowledge and also to prepare students for future collaborative work in their professional life.

Homework. In different types of courses, homework takes different forms. When it comes to Formal languages, automata and theory of computation course, which basically is mathematics, I believe that the only way to learn mathematics is to do mathematics. For this reason, I assign plenty of homework, which afterwards is discussed in groups in the classroom. In Theory of Science course, homework is given in a form of several essays, followed by the subsequent class discussions. In Research Ethics and Sustainable Development homework is given in the form of readings to be done before the class.

Compendia. In some courses, compendia were necessary teaching tools. For Formal languages, automata and theory of computation course and for Theory of Science and History of Computing I have written compendia for students, which are available at no cost on the web. Three compendia in Formal languages, automata and theory of computation course contained exercises with solutions, and some more advanced examples to be solved in the classroom. See Appendix D.

Grading. The purpose of grading in my view is in the first place motivational. The grade in a course is based on a mixture of class performance, results of continuous examination (mid-terms, "duggor"), essay writing, in-class activities, labs and seminars.

Feedback. I have a lively communication with my students. I encourage the use of the web and e-mail. I have a web page for each class, which allows students to access all class information (see the Course Syllabi and Information in the Appendix A1). I make an e-mail list of the class so that I can quickly contact students and I also send this list to the class so that students can contact each other for collaborative study. Also, in graduate courses where I have research paper writing and a seminar, I read the first draft of the paper, correct and comment on them and try to give each student suggestions for improvement. After that improvement is made, I correct and grade the final version of the paper that is presented at the seminar/mini conference.

Availability. For my classes I am available at virtually any time by e-mail. I also tell my students they are welcome to come by my office when they need additional help or want to discuss.

Exams. In my courses I have a continuous examination [essays, labs, seminars, mid-terms ("duggor"), peer-review etc.]. Formal languages, automata and theory of computation is the only course where I also have a classical exam ("salstenta"). Before each exam, we spend one lecture discussing topics to be covered and we solve exercises from an old exam as an example. On the course web page there is a collection of old exams with solutions. Learning is an important purpose of any exam and especially of midterm exams.

Course syllabi and information about courses. At the first class meeting, I present the class with the syllabus that gives the basic information for the course: the homepage for the course, which also contains my contact information. It also informs the students about the prerequisites, text, schedule and planned lectures content, the exams and quizzes, information on homework assignments, grading policy and the latest news. (See Appendix A1)

Use of technology. I use computer for my lectures, also for labs. As mentioned before, each of my courses has a web page, which allows students to access all class information. The syllabus and class results are available on the web, lists of homework assignments and reading assignments, and the literature and web resources needed. I have a "Latest News" section that informs the students of what is coming next, etc.

Sample course materials from my courses Formal languages, automata and theory of computation, Vetenskapsmetodik, Transdisciplinary Research Methods and Research Ethics and Sustainable development are given in Appendix A, while Appendix D contains two selected compendia I have written for my courses.

Appendix C gives a detailed example of the Swedish National Course in Philosophy of Computer Science held at MDH 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. I was the examiner and the responsible organizer. 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 results of the course included ten papers, which have been published in journals and conference proceedings or are included as chapters in PhD theses.

To sum up, my conclusion from experiences made so far is that the mixture of different learning techniques makes it possible for a student to develop his/her own learning strategies and approaches to the subject matter, so that they as a rule are capable to fulfill high standards of examination. In order to be sure about the sufficiently high criteria, I compare examination forms in my courses with corresponding examinations at international level. It is also very important for me that students develop independent and creative critical attitude, providing encouragement and help when needed.

III PEDAGOGIC DEVELOPMENT

My Education and Experiences

During my education I have tried to obtain the holistic world view through the study of sciences, humanities and arts. My academic background is in theoretical physics. The first part of my scientific career I worked for ten years as a researcher at the research institute for physics, where I practiced scientific methods as well as traditional academic skills by participation in scientific seminars, conferences, and teaching.

The next ten years period I spent within industry, ABB Atom, as criticality safety analyst, where I learned to apply theoretical results in real-life settings. I have written a Handbook on criticality safety, which is in use to this day, and participated in the training of safety personnel. I found questions of continuous learning and knowledge transfer very essential for high technological organizations. That was an interesting experience, and an excellent opportunity for me to see the complex relationship between a rule-based control system (handbook, theory) and real-life situations (applications).

During the third part of my research career I moved from physics to computing, theory of science and philosophy of science. Throughout that period I gained knowledge about humanities and their different research traditions and cultural heritage. I became more and more aware of the underlying value system and the importance of agency – the step that connects our rational understanding with our practical acting in the world, which led me to the study of ethics.

The fourth part in my professional career started with the move from Mälardalen University to Chalmers University of Technology. My research moved towards cognitive science and my teaching was dominated by the big classes of PhD course Research Ethics and Sustainable Development. At the moment I am part of the Interaction Design division, where perspective is human-centric and focused is on the interaction of a human with the environment which is very useful for the understanding of learning and teaching situation.

My present day teaching philosophy is a synthesis of more than thirty years of teaching and research experience. I have been active within a number of different teaching and learning cultures because of the fact that I worked as a researcher or teacher for extended periods of time in several countries (Croatia [Rudjer Boskovic Research Institute and University in Zagreb], Sweden [Manne Siegbahn Institute Stockholm, Mälardalen University, Chalmers University of Technology and University of Gothenburg], Italy [The Abdus Salam International Centre for Theoretical Physics], Denmark [Niels Bohr Institute Copenhagen]), and Germany [Darmstadt University of Applied Sciences] and I learned from each of them. From being inspired by lectures given by world-renowned scientists and researchers, to being given an opportunity to lecture myself and learn from different kinds of audiences. In the first place, experiences with various teaching cultures for me are the source of new ideas about variety of possible ways to approach teaching. There is no one single recipe for success – there are many factors that play in – from the relevance, interest and freshness of the subject, preexisting knowledge and motivation of the class, different didactical approaches to the open-minded, inclusive and benevolent atmosphere that is precondition for the exchange of ideas and learning.

Throughout my career I have considerably modified my views about the learning process. Gradually I shifted the focus from my own teaching as the presentation of the most important and most beautiful ideas in the most "elegant" manner (very common in physics and mathematics) towards motivating the reasons of formations of these ideas in their context and their mutual relationships. In that process I am moving towards the student's active participation in the learning process. In my teaching I am using a combination of methods and tools (lectures, seminars, laboratories, in-class discussions, role-play, computer simulations, etc.) and from course evaluations I can conclude that the parts of the courses that students value the most are those in which they play an active role.

Learning from Course Evaluations

Among the most important impulses to the improvement in my teaching are course evaluations. (For examples see Appendix A2). The precondition for a helpful course evaluation is a trustful contact between the teacher and the class. The class must feel that their opinions are important and that they can make a difference – this means serious and sincere effort on the part of both students and teachers to think at the same time critically and constructively. I have received excellent evaluations in PI- Swedish National Course in Computer Science and in graduate courses in Ethics, and good evaluations in other courses. See enclosures for a detailed listing of my course evaluations. My explanation of the higher evaluation results in specialized courses is that those courses attract very motivated students who are ready to work hard and enjoy challenges, while some of the courses were compulsory, which means that some of the students were not interested in the subject. However, even the lowest course evaluation was above 3.5, and typical results were always above 4 on a scale 1-5, which I consider to be good.

For me even more important than the average evaluation grade for the course are the specific comments, suggestions and opinions that students express. See attachments for a more extensive collection of student comments. Here are some of the changes I have incorporated into my classes as a result of course evaluations:

- The basic principle in my courses is that all course materials (readings, lectures, lab instructions, programs) are freely available on the web. We have Virtual Libraries with resources that student can use for essay writing and further own studies.
- More discussions and students work and less lecturing; Group work on assignments, peer reviews and in seminars.
- Detailed comments on draft papers in higher-level theory classes.
- More feedback from students' mid-semester examination.
- The workload more evenly distributed during the whole semester.

Work with PhD students

Thorough the years I have been working with many hundreds of PhD students in my courses. During one semester PhD course Research Ethics and Sustainable Development at Chalmers has typically two (spring term) or three (autumn term) classes with over 30 students each, about 150-180 students during one year and it means for me as the course responsible a lot of contacts, planning, organisation and grading, essays reading and organisation of "mini-conferences" that are the final examination in the course. Work with students in courses very often leads to either common publications or publications that I supervise but without being a co-author. From my courses students have published in international conferences and journals, see the lists in the Appendix A.

In work with individual PhD students as supervisor I learn a lot on the long journey from the first steps into the graduate education until the PhD degree. Up to now two of my PhD students obtained Licentiate degree and their PhD is planned for the next year. I have been co-supervisor and examiner and those experiences are much closer to the mutual learning process.

As the Vice Head of the Department of applied IT for graduate education I had opportunity to work with students and their supervisors and to understand graduate education from the top organizational and strategic level.

Development Priorities

Apart from the direct contacts with students and course evaluations, I improve my courses by learning from experiences of similar courses at well-reputed universities. What I find important for me as a teacher is the following:

- Enthusiasm for my subjects and command of the subject matter, including the integration of recent research results and methods in teaching
- Ability to stimulate curiosity, critical thought and independent learning in students
- Creativity in the organization, design and presentation of course materials
- Collegiality and respect in contact with students
- Prompt feedback to students on their learning and prompt answering of student's mails
- Sensitivity for equality and gender aspects of learning; Help for students from minority groups
- Systematic approach to teaching development
- Interdisciplinary, crossdisciplinary and transdisciplinary approach whenever possible
- Holistic, global view and ability to manage diversity
- Values and Ethics incorporated into all courses in various ways

An important source of inspiration and new insights comes as a result of participation in pedagogic courses, seminars, conferences, lectures, and other contacts with professionals dedicated to pedagogical work. From the first introductory course in 2000 until today I have met people who inspired me in my own work, and reinforced my own ideas about what is good pedagogy and how it is achieved. (See Appendix B) Research in computational cognitive modeling, information semantics, theory of science and ethics is in many cases closely related to epistemology – theory of knowledge. It makes me observant of my own and students ways of constructing knowledge, search for knowledge, reinforcement mechanisms, value systems and similar. Lately, reading Thagard (2005-2007) I started to reflect over the emotional aspects of learning, and I apply that knowledge in my everyday work with students.

One of the ways for me to develop as a pedagogue is to publish articles about my teaching experiences and expose my work for critical peer review of my colleagues. I have got an opportunity to both share my own knowledge and to learn from my colleagues that way.

Frequent topic on my presentations on technical conferences education tracks and popular public lectures was why and how Ethics should be integrated with technical curricula. Having experiences of Ethics courses for students of computer science and engineering, other technical and natural sciences, and occasionally even business students, I typically present results of my courses in Ethics, I have started, developed and taught from year 2003 until now at Mälardalen University and since 2014 at Chalmers University of technology.

IV CONTRIBUTION ON THE ORGANIZATIONAL LEVEL

I am trying to make a contribution at the level of the University, nationally and internationally, by establishing structures that promote values and ideas which I consider central for the future development. Here are the activities that I participate in, and some of them I have initiated and realized myself in collaboration with colleagues.

Contribution to Curriculum Development

My contribution to the curriculum development consists of introducing, developing, organizing and teaching the following courses:

- Professional Ethics and Research Ethics at MDH
- Computational Thinking Tools courses (DVA403 - DVA416 - DVA417), one of them at the University of Applied Sciences in Darmstadt
- In the Swedish PI network that I lead, we developed, organized and taught courses Computing and Philosophy (Swedish national graduate course) supported by KK foundation grant
- I revised and further developed as the course responsible, together with a team of colleagues, Research Ethics and Sustainable development course at Chalmers from year 2014 on.
- Transdisciplinary Research Methods, supported by IT faculty grant that made it possible to invite international and national guest lecturers. Jan Jonsson and Pär Mailing have been participating in both preparations for the application for the grant, as well as responsible for class activity in the course.

Contribution through Dissemination of Ideas

An efficient mechanism for disseminating new ideas and propagating new initiatives are public talks. Here is the list with my recent talks in which I propagate the idea of "Bildning", inter-disciplinarity and ethics.

- Supply Chain Social, Ethical and Knowledge Aspects - 2017 04 25 (Guest lecture)
- Digitalisation as a Strategic Choice at University – Challenges in Research and Education ECSS 2016 Budapest. Informatics Europe. European Computer Science Summit. 23.10.2016.
- Forms of Disciplinarity - SCCIIL (SSKKII) University of Gothenburg seminar. 18.04.2016.
- Preparing Next Generation of Software Engineers for Future Societal Challenges and Opportunities - IEEE Croatia Section Systems, Man and Cybernetics. 21 September 2015. Osijek. Croatia
- Ethics courses preparing next generation of engineers and researchers for future societal challenges and opportunities. ECSA 2015, Dubrovnik, ITS-EASY doctoral school workshop, September 2015
- Teaching Ethics to Engineering Students - Chalmers 17.04.2015
- ShanghAI Lecture: Information, Computation, Cognition. <http://shanghailectures.org> November 13 2014 ShanghAI global course is led by Rolf Pfeiffer from ETH Zurich https://cast.switch.ch/vod/clips/2lo0lccpcp/link_box (video recorded)

- Participating and Anticipating Actors and Agent Networks. Social Computing Understanding complexity: systems, emergence and evolution. University of León (Spain) 28. 01. 2014.
- Research Ethics - ITS-EASY PhD School Workshop Wien, March 25 2014
- The World Unfolding through Computation for an Embodied Cognitive (Epistemic) Agent. Ecocritical Forum/ Ekokritiskt forum, MDH 27 02 2013
- Ethical Challenges in Research and Supervision, Gordana Dodig Crnkovic and Nicklas Månsson, ITS-EASY post graduate school workshop in Paderborn, 2013 May 29 - June 1
- Contemporary Research and Knowledge Production. MDH PHD Course 19 02 2013
- Bildung & Computing. Invited talk on Swedish National Conference of University Teachers in Computing, (Ämneskonferens i datavetenskap och numerisk analys), Royal Institute of Technology, Stockholm, Sweden, June 14, 2006
- Professional Ethics in Software Engineering Curricula. Cross-disciplinarity in Engineering Education, 3rd CeTUSS workshop, Uppsala University, Sweden, 6 Dec 2005
- Professional Ethics in Science and Engineering. Invited talk on Annual Workshop of CUGS (The Swedish National Computer Science Graduate School) 2004
- Om vikten av att undervisa datavetare och datatekniker i professionell etik. Den femte nationella kvalitetskonferensen - Högskoleverket, Malmö högskola, 2003
- Professional Ethics in Computing and Intelligent Systems on SCAI 2006, Espoo, Finland, October 25-27, 2006. AI -Finland conference
- On Introducing Courses in Professional Ethics, E-CAP 2004 Pavia

Contribution as a member of the Research-Ethics Committee

Ethics is one of the fields I research in, so taking part in this committee was a natural consequence of that interest. The Ethics Committee's role is to promote ethical conduct among students and work proactively on implementing ethical approach in courses, diploma work and other educational activities. In 2005 I gave a brief introductory "crash course" in Ethics for the members of MDH Research-Ethics Committee. From 2009-2012 I was chairing this committee which gave me even more opportunities to act through organisation of popular lectures, giving lectures for PhD advisor courses and working on a daily basis with ethical issues concerning the whole of MDH.

For a more extensive list with my pedagogic publications and popularization work, see Appendix F.

Grants for Pedagogic Work

- 2015 GU grant for the development of the course Transdisciplinary Research Methods
- 2012 Guest lectureship at the Darmstadt University of Applied Sciences for teaching of the Computational Thinking course
- 2007-2009 NSH grant PIFF project connecting diploma work (ex-jobb) with research and industry in collaboration with Lund University and Blekinge Institute of Technology.
- 2004 KKS grant for the Swedish National Course in Philosophy of Computing.

Collaboration with Colleagues, National and International

I find the collaborations with my colleagues, at Chalmers, University of Gothenburg and the MDH, in Sweden and internationally absolutely essential in my work.

Research Ethics and Sustainable Development PhD course, for which I am responsible, is compulsory for all Chalmers PhD students. The core team has been changing, and last edition consisted of me, Magdalena Svanström and Sven Andersson with invited speakers Erik Bohlin and Claes Strannegård.

Transdisciplinary Research Methods consisted of invited lectures by well-known national and international researchers such as Wolfgang Hofkirchner, Søren Brier, Palle Dahlstedt, Jens Alwood, Elisabeth Ahlsén, Staffan Björk, Morten Fjeld, Christian Berger, Aarne Ranta, Peter Ljunglöf and others.

Collaboration in PI network and development of Computing and Philosophy Swedish National Course engaged the following colleagues: Ulla Ahonen-Jonnarth and Jan Odelstad from Gävle University; Björn Lisper, Peter Funk, and Jan Gustafsson from MDH; Torbjörn Lager, Göteborg University and Joakim Nivre, Växjö University. Also Kimmo Ericsson, MDH, Luciano Floridi, Oxford University and Lars-Göran Johansson from Uppsala University contributed as invited speakers.

Philosophy of Computing was a continuation of Computing and Philosophy was organized in collaboration with Peter Boltuc of Illinois University (see Appendix G). Lectures have been given by colleagues from USA (William J Rapaport, The State University of New York), Spain (Jordi Vallverdú, Universitat Autònoma de Barcelona), Greece (Vincent Müller, American College of Thessaloniki & Princeton University), Italy (Teresa Numerico, University of Bologna and the University of Salerno and Gaetano Aurelio Lanzarone, Department of Informatics and Communication, Varese).

In my courses in Vetenskapsmetodik (Theory of science) and Professional Ethics I have guest lectures from different disciplines and departments. Some of my invited speakers include: Jan Gustafsson, Ylva Bäcklund, and Ivica Crnkovic IDE, Kimmo Eriksson, Sten Lindstam and Hillevi Gavel, IMA, Birgitta Bergsten and Sture Packalén, IHu, Tord Heljeberg, Library, Lennart Harnefors, IEL, Kersti Malmsten-Gedda, IVF, Monica Eiborn, SKI and Vincent C. Müller, American College of Thessaloniki; Visiting Fellow at Princeton University, USA.

To sum up, I believe that both national and international collaboration is not only good and inspiring in the pedagogic work, but also inevitable. One of the processes we are witnessing today is the emergence of a new global networked society, which starts to show up as a result of information technology. The sooner we learn to collaborate, also internationally, the better our prospects to contribute to the development and to influence forming of nascent global knowledge society.

Future plans

My future plans include:

- Developing Transdisciplinary research methods course to be a common PhD course for the whole of Chalmers. At the moment it was a small class at Chalmers/GU, and an individual study course for my PhD students at Mälardalen University
- Start teaching Interaction Design courses
- Learn more about natural computation, adaptive systems, interactions and agent-centric constructive frameworks in cognitive science to apply in teaching
- Distance courses in Philosophy of Computing with the University of Illinois new development with inclusion of new collaborations
- Leading my two graduate students to PhD next year.
- Taking new doctoral students. Work with doctoral students is rewarding and inspiring and I am looking forward to share my knowledge and enthusiasm for learning with several more graduate students. One of them, with the thesis topic in Interaction Design is starting soon.
- Next year I will be co-chairing the international conference INFORMATICS EUROPE ECSS <http://www.informatics-europe.org> Each year on this conference some of the leading decision makers, deans and other leaders, in the Informatics research and education in Europe meet and discuss the most important current issues with relevance for the future of the discipline. This will give good opportunity to work on the issues of future of education in Europe on all levels.

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