

## TUITION PORTFOLIO

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### Personal Information:

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### Studies and Qualifications:

- PhD (eng) 1999, Lic Tech (1996), MSc Eng (1994), Tampere University of Technology.
- Docent, Biomedical Engineering, Tampere University of Technology 2003.
- Pedagogics / Didactics studies (Cumlaude-level), University of Tampere 2010.
- Pedagogics / Didactics studies, Tampere Polytechnics / Teacher School, 2006.

### Occupation:

- Principal Architect, Nokia Corporation (since 2001)
- Docent, Tampere university of Technology, Biomedical Engineering (since 2003)

### Abstract

This document includes information for my teaching activities and educational development on teaching. I was recognized as a qualified teacher in universities on 2003 and received the title of Docent. Thereafter I have studied pedagogics and didactics in the Tampere Polytechnics (2 year course) from where I received a licence to teach in Vocational schools, Polytechnics, and Vocational High Schools (2006). I continued my studies in the University of Tampere and received the licence to teach in comprehensive/elementary schools, and upper secondary school / sixth form (2010). I have worked as a teacher in the Tampere University of Technology and the Tampere Polytechnics. In addition, I have given several short courses, e.g., in Oulu Medipolis and TUT Edutech. In my current occupation in Nokia Corporation, I have prepared and given numerous presentations and short courses on various topics. My expertise field in teaching covers mainly biomedical engineering, medical imaging, image processing, wireless data communication, and systems engineering.

## Teaching History and Experience

### Lectures in TUT:

- 1998,1999 Processing of Medical Images, part time lecturer
- 2000-2009 Processing of Medical Images, lecturer
- 2010- Processing of medical images, part time lecturer
- 2001- 2003 Processing of Medical Images, exercises
- 2002-2005 Telemedicine, lectures for Bluetooth and Telemedicine
- 2003-2005 Digital Mobile Communication Systems, Bluetooth technology
- 1995-1997 Biomedical Engineering Laboratory Course I, part time lecturer
- 1997 Introduction to Medical Information Systems, exercises
- 1996-1998 Biomedical Engineering Laboratory Course II, part time lecturer
- 1998 Medical Imaging Methods, part time lecturer

### Lectures in Tampere Polytechnics:

- 2002-2006: Short Range Radio Systems and Bluetooth Course, lecturer, 2 courses per year.

### Seminars:

- 1998: 3D computer graphics, Instrumentarium Imaging / Edutech
- 2001: Medical Image Processing, Medipolis Workshop, Oulu, Finland
- 2001- Nokia AV Forum, numerous lectures

### Guidance of Theses

- 2000, Mika Räisänen: Compression of Medical Images for Storage Purposes, MSc Thesis, TUT
- 2002, Jarkko Tulkki: Development of Quantitative Methods for the Follow-up of Tumour Treatment, MSc Thesis, TUT
- 2008, Leena Näppi: Seating pressure measurement for individual seat design, Licentiate thesis, TUT

### Demonstration Lectures

- 2003, demonstration lecture for the title of Docent, TUT / Biomedical engineering.
- 2005, demonstration lecture for applying to a position of a professor in TUT / data communications.

## Generated Lecture Material

- **Heinonen T.**, 1997. Exercises for Medical Informatics Course, Tampere University of Technology, 10 pages.
- **Heinonen T.**, 1999. 3D Image Processing, Edutech/Instrumentarium Imaging; Image Processing 16-17.2.1999, 32 p.
- **Heinonen T.**, 2000. Lecture Material for the Course: Processing of Medical Images, Tampere University of Technology, 300 pages.
- **Heinonen T.**, 2001. Exercises for Processing of Medical Images, Lecture Material, Tampere University of Technology, 20 pages.
- **Heinonen T.**, 2003. Model Answers for the Exercises of Processing of Medical Images, Lecture Material, Tampere University of Technology, 24 pages.
- **Heinonen T.**, 2002. Lecture Material for the Course: Short Range Radio Systems and Bluetooth, Tampere Polytechnics, 150 pages.
- **Heinonen T.**, 2003. Lecture Material for the Course: Introduction to Telemedicine / Bluetooth, Tampere University of Technology, 23 pages.

## Participation in Pedagogics Education:

- 2004-2006, Tampere Polytechnics / teacher school, licence to teach in a vocational school, a polytechnics, a vocational high school, and in a university.
- 2007-2010, Tampere University, basic studies in didactics, licence to teach in comprehensive/elementary school, upper high school/Sixth form.

## Research/Reporting in Teaching

Identification of Top-down and Bottom-up learners and applying systems engineering tools in teaching. Research was conducted at the Tampere Polytechnics during courses on Bluetooth technology. Reported at the Tampere University / Courses of Didactics.

## Personal View on Teaching and Learning

People are unique – there are no two similar persons. Personality depend highly on genotype, parenting, experience of life, and random events. Even if it is possible to categorize properties of various people, the complete person is never fully understood. Parts of human properties are inherited from the process of evolution, and are maintained in a collective memory of humankind. Some of these properties benefit us, some are disadvantageous. Modern people have to process more choices in a day than their ancient ancestors during their entire life. Some involves learning; mental pressure and compulsory studying stress people – some adapt easier to this condition than others. Even if a human is unique, he/she is social; Society and culture guide the personal development during the entire lifespan. Deep and objective understanding of own state requires very wide perspective, because our life is guided by our needs for safety and vested interests. Some people experience studying offensive because they have to step out from their *comfort zone*. Little child enjoys all the new learning while an adult enjoy only learning such topics that she/he is interested in (e.g., hobbies, special interests). The social pressure and fear for failure force people to study such issues that do not interest them. Learning such issues is always more difficult than learning interesting issues. Information can be classified to theoretical information, and to hand-on information. Hand-on information represents such information that is obtained from experiences, or it is pre-programmed to our consciousness. Hand-on information is easy to learn. Theoretical information is obtained only via studying, researching, and thinking. Human brain stores huge amount of information that are networking; contexts are connected to each other. Separate *information cells* in our brain are not so useful, but the completeness where this information is connected to each other is an enormous resource. The most optimal way of learning takes place when a human combines theoretical information and hands-on experience; this leads to a profound understanding. Theoretical information alone is difficult to apply in practice. A human is stigmatized also with beliefs and assumptions that are based on intuition or experience. Quite often the beliefs are not connected to concrete information, and therefore leading to irrational operation. Less a human has gathered concrete information, more he/she has beliefs and assumptions. These assumptions and beliefs emerge every day; therefore we have active mechanisms to analyze our thinking. A human learns something new every day – usually by doing and communicating. This kind of learning (without efforts) is pleasant to us. If we have to struggle to learn something, we need to have a motivation. The motivation is often due to social pressure for success and personal interests. Teachers are responsible for motivating their students, especially if the students are not interested in the topic. Combining hand-on information with theoretical information seems to be very efficient method. Repeating the key issues and efficient visualization enables linking information elements to each other. In this way, it is possible to understand complex systems. Learning is a slow process – fast learning is usually short term. Therefore, learned issues need to be refreshed frequently in order to maintain them, and access them fast.

## Estimate for My Own Teaching

*"I am like the students, I am learning in my own lectures – I just target to share what I have learned this far"*

### How do I experience myself as a teacher?

- I target to clear structure and chronology.
- I use lots of humor.
- I am not infallible, I may even ask the opinion of students.
- I try to be as visual as possible; I draw pictures, I illustrate abstract concepts, and include lots of figure in my lecture material.
- I aim for interactivity, I urge students to participate the lecture..

### How do I experience the students?

- Students are all unique. I respect them. Some students who just arrive to the lecture without any motivation to learn something are challenging.
- Some students are impugning and they try to emphasize their knowledge. Quite often these students are most active ones, and have pressure in succeeding in the exam.
- Active students are the best, because they participate the teaching. However, many quiet person may pass the exam with top grade.
- Every student should be taken into account, but this is challenging especially in large groups.

### Feedback from others

I have received feedback from my students, because I usually ask them to anonymously fill an interview form during the examination. I have also asked feedback from my colleagues. In addition, my teaching was analyzed during my pedagogics studies. Following table lists the most common findings on a SWOT-table:

<p><b>Strength:</b></p> <ul style="list-style-type: none"> <li>- Clear struture on teching</li> <li>- Repetition</li> <li>- Visualization</li> <li>- Interactivity</li> <li>- Contact to students</li> <li>- Self confidence</li> <li>- Examples</li> <li>- Humor</li> </ul>	<p><b>Opportunity:</b></p> <ul style="list-style-type: none"> <li>- Apply different methods on teaching different topics</li> <li>- Creativity</li> </ul>
<p><b>Weakness:</b></p> <ul style="list-style-type: none"> <li>- Sometimes lack of preparation</li> <li>- Sometimes problems in describing complex issues in english language</li> </ul>	<p><b>Thread:</b></p> <ul style="list-style-type: none"> <li>- Lack of preparation</li> <li>- Teaching issues that are not completely understood</li> <li>- Developing cources further</li> </ul>