



UNIVERSITY
OF SKÖVDE



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YEARBOOK

PHD STUDENTS

2015

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FOREWORD

This is the first issue of the University of Skövde's PhD Yearbook featuring individual portraits of PhD students and their research projects. It is an attempt to bring into prominence the wide range of research carried out at PhD level at our university. The Yearbook, which is projected to appear annually, will be accessible to the general public, but at the same time it also represents a useful compendium for university staff where its members can find out more about the ongoing research at our university.

This yearbook also bears witness to the continuous increase in the number of PhD students at the University of Skövde since the early 1990s, when the University started to offer doctoral training. Today, the PhD students' fields of research cover all of the University's specialisations and include automation engineering, biology, biomedicine, business management, informatics, mechanics of materials, philosophy, product design, psychology and nursing science. Since 1 January 2011, the University of Skövde is entitled to award PhD degrees in Informatics and the first students received their PhD degrees at the University's conferment ceremony in October 2014.

I hope that the University of Skövde's doctoral training will offer all our PhD candidates a rich and varied professional career within or outside academia.

Sigbritt Karlsson, Vice-Chancellor



GÖRAN ADAMSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT Technology, Department: Mechatronics Research Centre, DeMontfort University, United Kingdom. University of Skövde, School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Primary Supervisor: Prof. Philip Moore, Faculty of Technology, Mechatronics Research Centre – Visiting Professor, Falmouth University. Second Supervisor: Prof. Lihui Wang, Professor at KTH Royal Institute of Technology, Stockholm Second Supervisor: Dr. Seng Chong, School of Engineering & SD, DeMontfort University. Independent Supervisor: Prof. Patric Eriksson, Falmouth University, CEO of Gothia Science Park.

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Function block-based adaptive control of robots.

BACKGROUND MSc in Computer Integrated Manufacturing, Loughborough University of Technology, United Kingdom.

Adaptive Robot Control as a Service In Cloud Manufacturing.

By using geographically distributed, cooperating shop-floors and manufacturing resources, the evolving manufacturing paradigm Cloud Manufacturing (CM) enables borderless joint ventures in collaborative manufacturing. Following the trend of focusing on company specialised competences and solely performing core manufacturing activities, while outsourcing related and supporting activities, is all in line with the possibilities of CM. Its most prominent feature is seamless and convenient sharing of a variety of distributed manufacturing resources, supporting the complete product development life-cycle. Implemented as cloud-services, they facilitate the realization of the idea of Manufacturing-as-a-Service.

The aim of this research is to describe a cloud service-oriented system for adaptive control of distributed manufacturing tasks in a CM environment. This thesis gives the technological perspective of how this cloud service can be realized and implemented. It is described for robotic assembly tasks, as Robot Control-as-a-Service (RCaaS). (However, the presented control concept is not restricted to assembly only, but is also applicable to other manufacturing applications). Some different manufacturing scenarios are described in which cloud services of different types are combined to complete different tasks. The enabling tech-

nologies within adaptive RCaaS are event-driven Function Blocks (FBs) and the concept of Assembly Features, and their combination into smart and distributable decision modules, AF-FBs. A two level planning structure is presented, which separates generic data from equipment-specific, in which Cloud Supervisory Planning (CSP) performs generic process planning and Local Operation Planning (LOP) performs detailed shop-floor operation planning and execution.



JULIUS ADEBAYO AWE

LANGUAGES English, Swedish

FACULTY OR DEPARTMENT Institute of Biomedicine, Department of Medical and Clinical Genetics, Gothenburg University. University of Skövde, School of Bioscience.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Afrouz Behboudi (University of Skövde), Co-supervisor: Tommy Martinsson (Gothenburg University)

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Prostate Cancer, MYO1C, Circulating Tumor Cells.

BACKGROUND Bachelor of Medicine and Surgery (M:B;B:S), Nigeria, MSc Molecular Biology, Skovde, Sweden..

Circulating Tumor Cells As Surrogate Biomarker of Prostate Cancer State

Prostate cancer, despite its high incidence in men is poorly understood molecularly and inaccurately diagnosed especially in the intermediate risk group of patients. The study of Circulating Tumor Cells (CTCs) has offered a chance to characterize solid tumors including prostate cancer molecularly. However, this opportunity is challenged by the rarity (1 CTC in 1-10 million peripheral blood mononuclear cells) and short life span of CTCs in circulation.

Cancer cells including CTCs are known to exhibit changes in their 3D nuclear organization, including that of telomeres, the protective ends of chromosomes. This study, through three-dimensional (3D) structural analyses, quantitatively measures changes in telomere size, numbers and telomere clusters (aggregates) in CTCs of intermediate risk prostate cancer patients.

Our rationale is that CTCs can be isolated based on their size using a dedicated Screen-CellR filter device and the 3D nuclear architecture of CTCs can be analysed for characterization and prognosis purposes. The size-based CTC enrichment technique takes advantage of the larger size of prostate cancer CTCs (15-25um diameter) as opposed to the

pore sizes (7.5um) that allow lymphocytes to pass. Moreover, this method is non-antibody dependent and has a high recovery rate making CTC enumeration and clinical correlation possible. The filter device also preserves the 3D architecture of the CTCs on the filter, thus allowing 3D quantitative analysis of the cells.

CTCs are dispersed into the blood stream from all parts of the parent solid tumour giving a good representation of the tumour unlike biopsies or any other tissue sampling method would. Our previous study demonstrated the presence of different subpopulations of CTCs in the same prostate cancer patient. This study aims to molecularly characterize these different CTC subpopulations in order to advance our knowledge of prostate cancer and translate this knowledge to earlier diagnosis and improved prostate cancer management in our clinics.



ANNA-LENA ALLERT

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science/Production and Automation.

SUPERVISORS AND THEIR AFFILIATION Main supervisor, Kristina Säfsten, School of Engineering, Jönköping University. Co-supervisor, Lena Aggestam, School of Business, University of Skövde.

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Operation Management, Industrial production, Lean production in SMEs, Assessing improvement initiatives.

BACKGROUND MSc in Technology and Health (KTH), BSc in Automation Engineering (University of Skövde).



MARTIN ANDERSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Amos Ng (University of Skövde). Primary supervisor: Anna Syberfeldt (University of Skövde). Co-supervisor: Sunith Bandaru (University of Skövde). Co-supervisor: Kalyanmoy Deb (Michigan State University).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Evolutionary optimization, Parameter tuning, Parallel metaheuristics, Simulation-based optimization, Discrete event simulation.

BACKGROUND MSc in Automation Engineering, University of Skövde, Skövde, Sweden; BSc in Computer Science, University of Skövde, Skövde, Sweden.

Contextual factors for successful improvement initiatives in SMEs

Summary

The objective of this research is to increase the knowledge and understanding of the internal contextual factors affecting both the implementation and the outcome of improvement initiatives in SMEs in collaboration with a business support agency.

Simultaneously, increased globalization and thereby greater international competition means that companies are facing great challenges today. In order to remain competitive, manufacturing companies have to improve their operations and hence improvement initiatives are common, eg implementing lean production, one of the most influential new paradigms in the industry. Small and Medium Enterprises' (SME) role is important for prosperity in the EU, since they are an essential part of society, contributing to national economy and welfare. Therefore publicly funded support systems aiming at strengthening the competitiveness in SMEs are common in Europe. One example is business support agencies supporting improvement initiatives aiming to enhance profitability and long-term competitiveness, e.g. implementation of lean production. Hence, many SMEs are implementing lean in collaboration with a busi-

ness support agency. But despite numerous research studies of this kind of interventions, there is a lack of knowledge whether the effects are the expected and there is little evidence of the positive effect of firm growth and development. Critical for success in improvement initiatives in general, as well as when implementing lean, is leadership and management involvement and one important leadership task is communication and information. SMEs is mainly defined by the number of employees but Ghobadian and O'Reagan (2000) argue that there are other variables than size that influence leadership, strategic planning and culture in companies. Thus SMEs cannot be regarded as a homogeneous group in all respects and further research is needed to gain understanding of the differences that may exist in the SMEs. A deeper insight in this area would enable business support organizations to improve and refine methods and practice to even better meet the companies based on their needs and their specific circumstances.

Parallelization and parameter tuning of evolutionary optimization algorithms and their applications

Summary:

Optimization is the process of choosing the best solution among a set of possible alternatives. All possible solutions to a problem form what is called a fitness landscape and the purpose of the optimization algorithm is to navigate this landscape to reach the global optima, while not getting stuck in any local optimum on the way. Earlier work have shown that no optimization algorithm can be better than all other algorithms on all problems. Optimization algorithms have parameters that are used to alter the search strategy for different problems to mitigate this fact. Finding the right parameters for a given problem and optimization algorithm can greatly increase its performance.

Evolutionary optimization algorithms use strategies inspired from natural evolution to evolve a population of solutions towards the optima. Most of these algorithms are sequential in the sense that they only process one solution at a time, although the population can often be evaluated in parallel. There are two main reasons for modifying a sequential algorithm to also process solutions in parallel. First, it allows for novel strategies that utilize cooperation to increase the efficiency of the optimization. It can also enable better

scaling since the parallelization is not limited to the size of the population.

The aim of the thesis is to investigate how optimization algorithms can efficiently utilize parallel computing resources. The approach is to modify existing optimization algorithms and do experimental studies to compare the performance against sequential algorithms. Parameter tuning will be used to maximize the performance of both sequential and parallel optimization algorithms and to gain novel insights into how they operate.



ERIK BERGSTRÖM

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Eva Söderström (University of Skövde), Co-supervisor: Rose-Mharie Åhlfeldt (University of Skövde).

EXPECTED COMPLETION OF PHD 2018

RESEARCH INTERESTS Information security, information security management systems, asset management, information classification.

BACKGROUND MSc in Computer Science, University of Skövde, Sweden.



JACOB BERNEDIXEN

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science, Production and Automation Engineering.

SUPERVISORS AND THEIR AFFILIATION Principal supervisor: Professor Amos H. C. Ng (University of Skövde), Primary supervisor: PhD Anna Syberfeldt (University of Skövde), Assistant supervisor: Professor Kalyanmoy Deb (Michigan State University), Industrial mentor: Senior Manager Productivity Engineering Per Thim (Volvo Cars).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Production system improvement using simulation based multi-objective optimization and simulation modelling and development.

BACKGROUND MSc in Industrial Engineering and Management, Linköping University.

An improved information classification process

Information classification is a vital part of Information Security Management Systems (ISMS), as it serves as the input to the risk assessment. Information classification has been around for decades in the military and governmental sector to value information in an organization, but the adoption of the process in ISMS has not been without problems, and many organizations are struggling to complete their classifications. In this work, several enhancements to the current process, as described by the ISO/IEC 27000-series are proposed, and the information classification process is clarified to simplify the implementation of ISMS.

The first step has been to identify and characterize the inhibitors and enablers in the information classification process, and to develop a process model for the current information classification process.

Enhancements to the current model are proposed by adding usage and lifecycle perspectives to the information classification process and the information classification scheme. Furthermore, a security declaration to complement the information classification process is proposed to better match the classifications of what information a system can handle rather than which information it

contains. The security declaration also brings in an advantage for system owners and administrators as it specifies in terms of functional requirements what the system can handle rather than what the effects of a loss in confidentiality, integrity or availability cause.

Production systems analysis and decision support using simulation based multi-objective optimization.

In this research, the analysis of production systems will focus on ways in which the performance of the production system can be increased and the decision support part of it will help in selecting the best improvement(s).

The global market that most manufacturing companies are operating in is extremely competitive. Their production systems are faced with challenges such as an increasing number of product changes at the same time as the lead-time between these changes is shortened. In addition, the fierce competition also demands that money spent on investments and on running the production is reduced. Therefore, enhancements of manufacturing operations serve a vital part in keeping up with the competition. Pinpointing the correct improvement actions and in which order they should be carried out is crucial. Reduction of cycle times, increases in availability, and quality are some examples of such improvement actions. In determining the correct actions it is also important to consider the level and robustness of the needed improvement. Selection of the most appropriate improvement(s) should also be based on the economic implications they have on the organization.

The overall aim of this research is to enable efficient improvement of the performance of real-world or future complex production systems. This is to be done by the exploration and validation of new, more effective and accurate methods of pinpointing areas within the production system that restrain its performance. The hypothesis behind this aim is that existing methods for pinpointing such areas fall short of suggesting any accurate improvement actions, especially when dealing with complex real-world production systems.



MARTIN BRODIN

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics, Information Systems.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Professor Anne Persson (University of Skövde), Primary supervisor: Professor Jeremy Rose (University of Skövde), Co-supervisor: PhD Rose-Mharie Åhlfeldt (University of Skövde).

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Information Security Management.

BACKGROUND Information Security Consultant.

Information Security Management for Mobile Devices.

The problem addressed by the research is a demand for increased flexibility when it comes to where organisational information can be reached and a wish for new computing devices to be adopted into the organisation. This puts managers in a difficult position, since they want the benefits of mobility and satisfying employees without exposing organisational data to risk. With dual-use computing, a device that is used both private and professional, there is a risk that the organisational data gets mixed with the user's personal data. This may lead to uncertainty about how the organisation's rules should be applied and what impact they will have on the user's privacy. When allowing mobile devices that can be used as dual-use device, managers have to weigh many factors, for instance security vs. privacy, risks vs. benefits and employee demands vs. organisational control.

The main scope of this research is information security management. The research will be technology independent and not look into technical solutions and vulnerabilities. To deal with this problem, Action Design Research (ADR), where the research is practice-inspired and the artefact is theory-integrated, will be conducted. ADR addresses a problem

from practice and then constructs and evaluates an artefact that solves the problem. In this case, it means to theoretically design an artefact and then test it in practice. The artefact will be a set of tools to help with decision-making and implementation in organisations when it comes to device management. The expected result is a framework consisting of a method, supported by a maturity model, which can be used as support in managerial strategy development for introduction of mobile devices based on an information security perspective. The work will facilitate with information security management systems and be related to established standards to narrow the gap between strategic management and information security management.



ANNA BROLIN

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Keith Case (Loughborough University), Co-supervisors: Peter Thorvald (University of Skövde), Gunnar Bäckstrand (University of Skövde).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Cognitive ergonomics, Information design, User centered design, Manual assembly.

BACKGROUND MSc in Product Development, Luleå University of Technology, Sweden..

The road towards a user centred workplace: Strategies for designing information in production systems

Today's complex production systems in the automotive industry put heavy demands on the assembly workers' mental (and physical) capability. An increasing amount of product variants cause an increased information load resulting in the assembler being provided with too much information rather than the right information. The assembler then fails to assemble the correct and required parts in spite of available information as well as leading to unnecessary mental workload. The main focus is to improve the work situation for the assembler by approaching a user-centred view of the manual assembly and investigate how different types of information presentation affect the user.

This thesis mainly explores methods within cognitive ergonomics and information design, research fields that are traditionally applied and used within human computer interaction (HCI). However, the cognitive aspects and findings from the field of HCI are valuable and needed in this research. It is for example important to understand how information is perceived and processed when designing an interface, so that the user is able to perform a correct task based on the given information. Several observations and cases

studies were made regarding current production systems involving factors such as material presentation, information presentation and component variation. The result proposes new strategies to present information at the right time, with the right content and in the right layout.



ERIK BROLIN

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Roland Örtengren (Chalmers University of Technology) Co-supervisor: Dan Högberg (University of Skövde) and Lars Hanson (University of Skövde and Chalmers University of Technology).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Ergonomics, Human Factors, Anthropometry, Digital Human Modelling, User Centred Design.

BACKGROUND Licentiate of Engineering, Department of Product and Production Development, Chalmers University of Technology, Sweden; MSc in Ergonomic design and Production, Luleå University of Technology, Sweden.

Consideration of anthropometric diversity: Methods for virtual product and production development.

Ergonomics and Human Factors address factors important to consider in the product and production development process. This is done through a User Centred Design process where focus is put on human-machine interactions. Digital human modelling (DHM) tools provide and facilitate rapid simulations, visualisations and analyses of the human-machine interactions in a virtual environment. Anthropometry, the study of human measurements, is central in DHM simulations due to the necessity of ensuring intended accommodation levels. Several methods have been described to consider the anthropometric diversity that exists within human populations. Still, many simulations are done with few human models, so called manikins, in industry today due to the time consuming processes when working with many manikins in current DHM tools. Hence, there is a need for better tools and methods. To increase the understanding among DHM users there is also a need to illustrate differences in results when using different approaches, and to evaluate the validity of the assumptions that methods for anthropometric diversity consideration are based upon.

In this thesis current methods for anthropometric diversity considerations have been reviewed and the differences in evaluation results when utilizing different approaches have been analysed. New methods and functionality have been developed and implemented in DHM tools and the possibilities to include more physical characteristics and in turn consider more aspects of human diversity have been explored. Results shows that the proposed methods are advantageous compared to approaches often used in industry today and will, if used, increase the consideration of anthropometric diversity when using DHM tools for the design of products and workplaces.



CAROLINE BÄCKSTRÖM

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Health and Education, University of Skövde; Research School of Health and Welfare, Jönköping University; Skaraborg Hospital, Skövde, Sweden..

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Lena Mårtensson (University of Skövde), Co-supervisor: Stina Thorstensson University of Skövde), Marie Golsäter (University of Jönköping).

EXPECTED COMPLETION OF PHD 2018

RESEARCH INTERESTS Support during childbirth.

BACKGROUND Registered Nurse, University of Skövde. Registered Midwife, University of Skövde. MSc, University of Skövde..

Experiences and effects of support during childbirth. An explorative and evaluative study.

Thesis summary:

The overall aim of the thesis is to explore and evaluate the support first-time parents receive and are in need of during childbearing. The study will apply both a qualitative and quantitative approach. To explore first-time parents' experience of need for and received support, individual in-depth interviews will be used to collect data in study I, III-IV. Interviews will be analysed using phenomenography and latent content analysis.

To explore the effects of support for childbirth and parenting recording to first-time parents' sense of coherence, quality of dyadic relationship, birth outcome and birth experience, a quantitative approach including repeated surveys will be conducted in combination with medical record review in study II. Quantitative data analysis will contain descriptive and analytical statistics.



KARL DREJING

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Tom Ziemke (University of Skövde). Primary Supervisor: Paul Hemen (University of Skövde). Co-supervisor: Serge Thill (University of Skövde). Co-supervisor: Erik Billing (University of Skövde).

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Biological Motion, Human-Robot Interaction, Motivation theory, Signal detection theory.

BACKGROUND MA in Cognitive Science, Lund University, Lund, Sweden; BSc in Psychology, Lund University, Lund, Sweden.

Attention, Intention and Biological Motion in Human-Robot Interaction.

This research aims to examine how motion kinematics can be used to trace internal mental states, such as attention and intention. More specifically, it is important to look for signs of when attention breaks and what cues are present in that moment.

Traditionally, mental states such as attention have been inferred by eye-tracking. The eyes have been seen as “windows into the mind” from which mental states, such as attention, can be traced. This thesis aims to investigate if motion kinematic data can be incorporated in the metaphor above.

The main aim of this thesis is to examine if kinematic data can be used to trace mental states, such as attention and intention. To achieve this, experiments will be conducted to find “attention primitives”. These primitives can be seen as unique motor patterns special to attention. Finding these primitives can be beneficial in Human-Robot Interaction, since they convey information about internal mental states. This would allow the robot to notice when, for some reason, the interaction partner is no longer attending an object, the robot or the interaction itself. Given this information, the robot can adapt its behavior in order to regain the attention of its interaction partner.



STEFAN ERICSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Professor Thorsteinn Rögnvaldsson (Halmstad University), Co-supervisor: PhD Björn Åstrand (Halmstad University), Co-supervisor: Professor Achim Lilienthal (Örebro University).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Mobile Robot Navigation; Image processing; Visual odometry.

BACKGROUND MSc in Electrical Engineering, University of Skövde.

Visual navigation for mobile robots in agricultural field environment.

Industrial robots have been used in decades for automation in industry, which have resulted in fully automated production lines. The automation level of field operations in agriculture is much lower, even though there are tasks particularly suitable to be automated. One example is weed control in organic vegetable production, which is still done manually. This research is about finding methods to solve agricultural tasks with computer vision and mobile robots.

The thesis presents methods for navigation and positioning of a mobile robot using cameras. The localization problem of a tractor-like vehicle is explored by simulations, lab experiments and field experiments. Specifically, a simulator is developed to generate images of a field, which is used for both detection and navigation. A major part of the thesis is spent on evaluating visual odometry on monocular, stereo-camera and omnidirectional cameras (catadioptric and fisheye lens).

The aim of this research is to increase the knowledge about visual navigation in outdoor field environment to enable automation of field operations by autonomous field robots.



ANDERS ERIKSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT Department Alpha (DRST-group), School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Sten F Andler (University of Skövde), Primary supervisor: Birgitta Lindström (University of Skövde), Co-supervisor: Jeff Offutt (George Mason University).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Model Based Testing, Model Transformation, Static and Formal Analysis.

BACKGROUND MSc in Computer Science, Linköping University, Sweden.



VERONICA FORNLÖF

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Diego Galar (University of Skövde), Co-supervisor: Anna Syberfeldt (University of Skövde), Torgny Almgren (GKN Aerospace Engine Systems).

EXPECTED COMPLETION OF PHD 2018

RESEARCH INTERESTS Maintenance, Mathematical optimization, Remaining Useful Life.

BACKGROUND MSc in Mechanical Engineering, Linköping University, Linköping, Sweden.

Platform Independent Level of Testing

This research aims to provide a general methodology enabling comparison of test requirements that satisfy structural coverage criteria, generated from the same or different design levels where general should be interpreted as not domain specific. Model-Driven Development (MDD) environments often focus on functional testing, enabling the verification of design models against their specifications. Sometimes we must also show that these specification-based tests cover the structure of the implementation.

A platform independent model is a design model that ignores concerns regarding the implementation language, operating system, and target hardware. A model compiler translates a design model to code, directly or via an intermediate platform specific model. A model compiler is free to transform a design model in any way as long as the behavior of the transformed program is the same as specified in the design model. The structure of the code might therefore differ from the structure in the design model. The fact that the structure might differ between design model and code becomes a problem when applying structural coverage criteria for testing, since full test coverage for a design model does not necessarily mean full test coverage for the code.

These potential problems apply to both design models with automatic code generation and manual coding. For safety-critical systems in model driven development the problem is real since structural code coverage often is required.

Improved aircraft engine maintenance optimization using classification of on-condition parts

Maintenance of aircraft engines is an expensive and time consuming operation that typically accounts for 10-20 percent of aircraft related operating costs. In a time when it is important to be more and more competitive, GKN Aerospace Engine Systems (GKN) has decided to finance a research project within the area of improved maintenance optimization.

Today's maintenance planning process is almost completely manual where decisions on what modules and components to maintain are based on heuristic measures. Due to a new tool, that has been developed and launched at GKN, which is used to calculate how much life the Life Limited Parts (LLP) have consumed, the planning process has become more complex and a tool to support the maintenance planning is therefore required. This tool will during the upcoming year be developed within GKN, and will be based on a mathematical optimization model that has been developed in cooperation with Chalmers. To be able to incorporate all components that are important for the maintenance planning process, it is necessary to develop better methods to estimate how much life time the on-condition parts (OC-parts) have left.

The status of OC-parts are, in the current maintenance process, only identified and detected through inspection and non-destructive testing. The remaining lives for the OC-parts, that are to be included in the optimization model, are therefore currently estimates based on historical failure data. This evaluation, as well as the estimation of the remaining life for the OC-parts, could thus be improved if the parts could be divided into different life-length groups using some classification method.

This project proposes to develop a method (a "classification scheme") to divide the OC-parts into classes depending on component status, detected and identified fault modes, and actual life. The classes will then be used to estimate the remaining life for each component, i.e. how long the part can be kept in operation. This is expected to lead to more accurate predictions of remaining lives, which will lead to more reliable optimizations results.



CHRISTIAN GADOLIN

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Business.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Thomas Andersson (University of Skövde), Co-supervisors: Nomie Eriksson (University of Skövde); Ewa Wikström (University of Gothenburg).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Leadership, organizational analysis, institutional logics.

BACKGROUND Master of Science in Management, Graduate School at the School of Business, Economics and Law, Gothenburg University. Master of Science in Business Administration, School of Business, Economics and Law, Gothenburg University. Bachelor of Science in Business Administration, School of Business, Economics and Law, Gothenburg University.

Development work in healthcare – an institutional logics perspective

Development work to improve quality, efficiency and productivity in healthcare has evolved to a major topic both in research and practice throughout the Western world. This type of development work is relatively new for healthcare, being organizational related and often management initiated, compared to traditional development work typically driven by physicians and related to medical and/or technical innovations. In public healthcare, the introduction of this type of development work can be seen as a consequence of New Public Management reforms emphasizing more 'hands-on-management', implying more of a management-initiated and planned approach to development and change.

The healthcare sector has been described as an example of an institution where management reforms have had limited impact on actual practice. The values, behavior, and ultimately the actions of professional actors, have been suggested to constitute the barrier for such reform initiatives to achieve substantial anchoring in practice. Yet, there is a lack of research focusing on actions, approaches and participation on individual and group-level in healthcare organizations.

The aim of this dissertation is to increase the understanding of healthcare professionals' perception, involvement and engagement in development work efforts.



NIDAL GHOSHEH

LANGUAGES Swedish, English, Arabic, Hebrew

FACULTY OR DEPARTMENT School of Bioscience.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Stina Simonsson (University of Gothenburg), Co-supervisors: Jane Synnergren (University of Skövde), Helena Carén (University of Gothenburg).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Stem cell technologies, DNA methylation, Hepatocyte differentiation.

BACKGROUND MSc in Biology, University of Gothenburg, BSc in Biology, The Hebrew University of Jerusalem.

Aberrant DNA methylation patterns in hepatocytes derived from human pluripotent stem cells

Stem cells technology has a great potential to replace animal models in addition to answering the shortage of human tissues and cells used in research, drug discovery and regenerative medicine. Hepatocytes differentiated in vitro from human pluripotent stem cells (hPSC) may provide an unlimited source of hepatocytes with high relevance and high reproducibility, useful in drug development, toxicology screens and regenerative medicine. However, these cells have in some aspects shown limited functionality compared to their in vivo counterparts, which hampers their usefulness. Several studies have shown abnormal DNA methylation during in vitro differentiation of stem cells into different cell type including hepatocytes. These abnormalities may underlie the impaired functionality of the cells. Our recent research revealed that the gene expression profile of pre-hepatic and hepatic markers of different hPSC lines differentiated in vitro into hepatocytes shows minimal variations, while their metabolic activity is highly variable, implying epigenetic regulations. This project is the first to perform detailed studies of DNA methylation and gene expression dynamics during hepatic differentiation of six different hPSC lines

using a robust universal differentiation protocol, in order to reveal clues about the mechanisms underlying aberrant DNA methylation. The results will be used to generate fully functional hepatocytes by applying chemical and/or genetic manipulation techniques.



AINHOA GOIENETXEA URIARTE

LANGUAGES Basque, Spanish, English, Swedish

FACULTY OR DEPARTMENT School of Engineering.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Amos Ng (University of Skövde), Primary supervisor: Matias Urenda Moris (University of Skövde) and Co-supervisor: Kalyanmoy Deb (Michigan State University, USA).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Process improvement and innovation, Lean Production, Discrete-Event Simulation and Simulation-Based Multiobjective-Optimization for healthcare and manufacturing systems.

BACKGROUND Equivalent to MSc in Manufacturing Engineering, University of Mondragon, Mondragon, Spain; BSc in Computer Science & Engineering, University of Mondragon, Mondragon, Spain.

Lean Production and Simulation-Based Multi-Objective Optimization for logistics and healthcare systems

Lean production has become a common approach for process improvement in many industrial and healthcare organizations. But despite all the benefits that this philosophy can offer, it lacks the scientific methods and models to support the evaluation of different improvement alternatives. Many researchers have proposed that simulation is the perfect tool to complement Lean production by addressing its deficiencies. Recently, meta-heuristic optimization has endowed simulation to be an even more powerful technique and particularly, when there exist multiple conflicting objectives. Simulation-based Multi-objective-Optimization (SMO) is a promising approach to generate multiple trade-off solutions, so that the decision maker is provided with the “best” alternatives to consider before taking decisions. The aim of this thesis is to develop a methodology which combines SMO and the lean production approach and to analyze how the implementation of this methodology benefits the company and impacts on its organizational culture.



KRISTENS GUÐFINNSSON

LANGUAGES Swedish, English, Icelandic

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Jeremy Rose (University of Skövde), Co-supervisors: Anne Persson (University of Skövde), Mattias Strand (University of Skövde), Mikael Berndtsson (University of Skövde).

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Informatics, Business intelligence, Information systems, Management.

BACKGROUND MSc in informatics, University of Skövde, BSc in Information Systems University of Skövde, BSc in Business Administration, University of Skövde.

Process orientated Business Intelligence.

The overall focus of the research is to analyze how business intelligence is utilized in small and medium enterprises. Currently, I am researching how business intelligence can be used to help construction companies in Norway to manage their processes and economy. A company can have well defined processes when building houses, and many projects in progress, but still go bankrupt. This is often due to the fact that the companies do not have means to assess the financial consequences of taking on new projects. The focus of the research is therefore to analyze current processes, improve processes that are not efficient and understand what information is needed for management to make sound decisions. The aim of the project is then to create a method (Smallbuild+) based on best practices that can help construction companies to improve their processes, their economic situation and to understand their information needs.



PATRIK GUSTAVSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Lihui Wang (KTH). Primary supervisor: Anna Syberfeldt (University of Skövde). Industrial mentor: Rodney Brewster (VCC Skövde).

EXPECTED COMPLETION OF PHD 2020

RESEARCH INTERESTS Human Robot Collaboration, Robotics, Simulation, Optimization, Artificial intelligence.

BACKGROUND MSc in Automation Engineering University of Skövde; BSc in Automation Engineering.

Human Robot Collaboration using Multi-Modal Communication

This research explores the possibilities of creating a human robot collaborating system. How to work together with industrial robots in a fenceless working space. The research is part of a larger project called Symbiotic Human-Robot Collaborative Assembly: Technologies, Innovations and Competitiveness (SYMBIO-TIC).

The thesis will focus on using multi-modal communication in order to establish human robot collaboration. The different medias that will be used are Visual, Auditory and Haptic. Visual includes image processing or other sensory data to analyze the position of workers, different gestures, motion etc. Auditory covers the speech recognition e.g. to give oral commands to a robot. Haptic involves the touch and pressure sense of the robot e.g. guiding a robot by adding pressure to it. These medias together will provide a fully functional multi-modal communication which will enable human robot collaboration.

The aim of the project is to create a fully functional multi-modal communication system in a demonstrator which will be located at Volvo Cars Corporation in Skövde.



MAGNUS HOLM

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT Faculty: Technology, Department: Mechatronics Research Centre.

SUPERVISORS AND THEIR AFFILIATION Primary Supervisor: Prof. Philip Moore, Falmouth University). Second Supervisor: Prof. Lihui Wang, Professor at KTH Royal Institute of Technology, Stockholm. Second Supervisor: Prof. Amos Ng, University of Skövde, School of Engineering Science. Independent Supervisor: Prof. Patric Eriksson, Falmouth University, CEO of Gothia Science Park.

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Adaptive decision support for shop-floor operators using event-driven function blocks.

BACKGROUND MSc in Automation Engineering, University of Skövde.

Adaptive decision support for shop-floor operators using event-driven function blocks

Sweden is a strongly industrialised nation with a high national trade surplus for the past decades. International competition is constantly increasing, demanding a proactive approach to maintain a leading position as an export intensive nation. All manufacturing companies will be facing big challenges in their further development. These challenges include increasing the knowledge content in the production, which emphasize the importance of developing employees' achievements and increasing production flexibility and productivity. Cooperation between highly skilled employees and production systems with a high degree of both automation and flexibility will be essential when complexity in future production systems increase.

The research is aiming a working environment with increasing complexity and demands where decisions affecting the production output continuously have to be made. The scope of the shop-floor operators has dramatically changed since the modern production industry emerged during the first half of the 20th century. And the transformation will continue bringing even higher demands on excellence, flexibility, holistic view and knowledge for the shop-floor operators. The working en-

vironment faced by the shop-floor operators is influenced by external variables set by demands from the market in combination with internal stochastic variables, such as fixture shortages, missing or broken tools, express orders, down-time for machines and changes in the number of available operators. Such stochastically changing conditions require a shop-floor operator to be able to handle and act in an information intensive environment with an increased degree of uncertainty.

To help the shop-floor operators to keep a high output from the production system event driven function block technology is used to investigate a framework for a shop-floor decision support system.



JULIA KAIDALOVA

LANGUAGES English, Ukrainian, Russian, Swedish

FACULTY OR DEPARTMENT School of Engineering, Jönköping University and School of Informatics, University of Skövde.

SUPERVISORS AND THEIR AFFILIATION Ulf Seigerroth, Jönköping University; Anne Persson, University of Skövde.

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Enterprise modeling, participative enterprise modeling, enterprise architecture, business and IT alignment.

BACKGROUND M.Sc. in Information Engineering and Management, Jönköping University, Sweden; M.Sc. in Information Management Systems and Technologies, National Aerospace University, Kharkiv, Ukraine.

Towards a definition of the role of enterprise modeling in the context of business and IT alignment

Thesis summary: In order to solve a problem of Business and IT Alignment (BITA) it is important to consider various dimensions of it: strategic, structural, social and cultural. In the context of dealing with BITA, Enterprise Modeling (EM) is an acknowledged and widely used practice. On one hand, EM facilitates the creation of integrated models that capture and represent different focal areas of an enterprise, therefore it allowing to obtain a multidimensional view on an enterprise and to integrate these multiple dimensions into a coherent structure. These capabilities make EM a powerful tool for dealing with the strategic and structural dimensions of BITA. On the other hand, solving a BITA problem requires dealing with the numerous points of view of the stakeholders and creating a shared understanding between them, which refers to the social and cultural dimensions of BITA. In this regard EM is also able to provide support to the development of an understanding about the current multidimensional praxis and future vision and strategies. Thus, EM has a high potential for dealing with the strategic, structural, social and cultural dimensions of BITA. Julia's thesis aims to investigate the applicability of EM in the light

of BITA and proposing a framework that allocates intentions of EM application within the frame of the Strategic Alignment Model. The framework positions EM conceptually in the context of BITA and identifies a number of EM challenges and recommendations to suggest how EM can be used to facilitate BITA.



PETRI J. KAJONIUS

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT Department of Psychology, University of Gothenburg, School of Health and Education, University of Skövde

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Ali Kazemi (Skövde University), Co-supervisor: Boo Johansson (University of Gothenburg; Director of the PhD-program).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Work psychology, Personality trait psychology, Happiness studies, Cognitive development, Gene-environment interaction, Personality disorders (DSM-5).

BACKGROUND MS in Social Psychology, Lic. in Work Psychology, adv. level in Pedagogy, bach. level in Philosophy. Book published (2011). Publications in Psychological Reports (Ammons), Personality and Individual Differences (Elsevier), as well as the Gerontologist (Gerontological Society of America) and Health and Social Care (Wiley). Main teaching interests are within the behavioral sciences (group psychology, social psychology, personality psychology, work- and organizational psychology, abnormal psychology). Current research, parallel to the thesis, are Big Five traits, Dark Triad traits, psychopathy, empathy, universal values, morality, which has been presented at for instance European Conference of Personality (ECP17) and International Society for Intelligence Research (ISIR).

Predictors of Satisfaction with Elderly Care.

This research project stems from the Swedish National Board of Health and Welfare (Socialstyrelsen), and investigates why care units in home care and nursing homes, as well as municipalities, differ regarding satisfaction with overall elderly care and care process variables (treatment, safeness, information, respect, influence). Responses from N = 95,000 older persons is the platform for the research, complemented with over 100 hours of field studies and 50 interviews with key persons within elderly care, as well as a planned data gathering from care workers in various municipalities all over Sweden. So far the research has shown that resources such as money, personnel, or educational level has minimal or no impact on satisfaction with care. Furthermore, older persons' variables such as levels of anxiety, health conditions, or susceptibility to loneliness, can be counterbalanced by successful elderly care (publication in press, Gerontologist). Also, in a Karolinska Institutets outlet, Socialmedicinsk tidskrift, we have in a peer-reviewed article informed the public on the flawed ranking system between municipalities. Currently, the thesis is looking to report on the most impactful process variables for satisfaction with care, which has attracted much interest from policy makers and media. The thesis

will include 4-5 internationally published articles, as well as an appendix of 2-3 for the thesis relevant articles.



CHRISTINA KARLSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT University of Skövde, School of Health and Education, Department of Nursing science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Ingrid Bergh (University of Skövde), Co-supervisor: Marie Ernsth Bravell (University of Jönköping), Kristina Ek (University of Skövde).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Nursing, neuroscience, instrument development, quality improvements, implementation research.

BACKGROUND MSc in Nursing, University of Skövde, Sweden; BSc in Nursing, University of Skövde, Sweden.

Identification, assessment, and measurement of pain in people with cognitive impairment and dementia: experiences from municipal dementia care practice

This thesis includes four empirical studies, exploring and describing Swedish municipal registered nurses' and certified nursing assistants' experiences of assessing symptoms of pain among older people who have intellectual impairment and difficulties to verbalise their pain problems. Multiple methods including interviews, systematic observation and instruments for data registration are used to explore how pain is identified, assessed and measured by nurses working in municipal dementia care practice, what their judgements are based on and, whether there are any challenges involved in the pain assessment situation. An observational behavioural pain assessment scale is tested and evaluated in order to investigate whether such a tool may help and assist municipal nurses in pain assessment situations among people with cognitive impairment and dementia. Language translation, staff training, systematic observation and data registration is included in the thesis. Both qualitative and quantitative analyses are applied.

The overall aim of the thesis is to explore and describe registered nurses' and certified nursing assistants' experiences of identifica-

tion and assessment of pain in older people with cognitive impairment and dementia. A further aim is to evaluate the Abbey pain scale-SWE (APS-SWE) in older people living in special housing accommodation.



INGEMAR KARLSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Amos Ng (University of Skövde). Primary supervisor: Anna Syberfeldt (University of Skövde). CO-supervisor: Sunith Bandaru (University of Skövde).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Simulation-based optimization, Cloud computing.

BACKGROUND M.Sc. in Automation engineering, University of Skövde; B.Sc. in Computer science, University of Skövde.

Interactive and intelligent decision support in manufacturing using simulation-based innovization and cloud computing

Achieving the best overall performance of a manufacturing system is a complex task because it involves the selection of the design with the optimal combination of all design variables. To help with this it is possible to build a simulation model depicting the manufacturing system. A simulation model is a tool widely used for answering questions based on what-if scenarios. To answer more complex questions, i.e. how to achieve a certain goal, other techniques in addition to simulation are needed. Using data mining to analyze the results from simulation-based optimization has shown promising results for doing more complex knowledge extraction from a simulation model. In simulation-based optimization a simulation model is combined with an optimization algorithm. The optimization algorithm searches for the best input parameters by evaluating them in the simulation model. This process can generate a large amount of data which can be analyzed with a data mining algorithm to extract knowledge about a manufacturing system.

The process of performing a post-optimality analysis of Pareto-optimal solutions from multi-objective optimization is called Innovization. This research will explore how a deci-

sion support system using Innovization can be designed. There are inherent issues with both simulation-based optimization and data mining with for example computational requirements. The research will also study how a decision support system using Innovization can be applied in a cloud computing environment to make use of the scalable and elastic properties.



ARI KOLBEINSSON

LANGUAGES English, Icelandic, Swedish

FACULTY OR DEPARTMENT School of Engineering Sciences.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Dan Högberg (University of Skövde). Supervisor: Peter Thorvald (University of Skövde). Co-supervisor: Jessica Lindblom (University of Skövde).

EXPECTED COMPLETION OF PHD 2018

RESEARCH INTERESTS Usability design and cognitive ergonomics/human factors of high stakes environments, cognitive coping strategies for interrupted tasks.

BACKGROUND CPL/ATPL from Icelandic Flight Academy; BSc in Cognitive Science, University of Skövde; MSc in Informatics, University of Skövde.



ERIK LAGERSTEDT

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Serge Thill (University of Skövde). Co-supervisor: Maria Riveiro (University of Skövde). Co-supervisor: Paul Hemeren (University of Skövde).

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Trust, Interaction, Artificial agents, User interface.

BACKGROUND MA in Cognitive Science, Lund University, Lund, Sweden; BSc in Theoretical Physics, Lund University, Lund, Sweden.

Context awareness in industrial notification systems

This research aims to find ways of minimising the effect of interruptions on workers who get information updates through computerised information systems. Such systems notify users immediately when a message is received without regards to the task that the user is performing. This prioritises the interruption over the current primary task. The current research aims to create a framework that explains when and why to immediately notify and when to wait with notifications, as well as finding more appropriate points at which to interrupt the user.

Interaction with artificial agents

This research is focused on interaction with artificial agents. Initially it is more specifically the interaction between a human that is driving a car and the car, and the effects of manipulating this interaction that are studied. Apart from generally exploring the effects of manipulations of that kind of relationship, the specific case of trying to improve eco-driving by manipulating the design of the interface of other parts of the system is examined.

At a later stage, other constellations of interactions will be looked into. For example, interaction between artificial agents, or groups with more than two agents might be taken into consideration. The research will focus in particular on trust as an aspect of interaction. For example, questions regarding if, and in that case how, trust is relevant in different kinds of interaction will be considered. Additionally, differences between the agent and correlations with the agents roles in the interaction are of interest.



CARINA LARSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science, Production and Automation Engineering.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Professor Kristina Säfsten (Jönköping University), Co-supervisor: Anna Syberfeldt (University of Skövde).

EXPECTED COMPLETION OF PHD 2019

RESEARCH INTERESTS Performance measurement; Continuous improvements.

BACKGROUND MSc in Civil Engineering, Luleå University of Technology, 1993.

Performance measurement communication supporting lean production in small and medium-sized companies.

Small and medium-sized enterprises today meet tough competition from low-cost countries. To survive, many of them try to implement lean production, but not all of them succeed. Evaluation of the performance and communication of targets and results have proved to be critical success factors in the implementation of lean production. This research shows that although all existing research in performance measurement, the research in performance measurement communication supporting lean production is rare, especially for small and medium-sized enterprises.

The purpose of this research is to explore how and when performance measurement communication can support lean production in small and medium-sized enterprises (SMEs). This is done in two phases, starting with the licentiate study. During this first phase of the research, the focus is on understanding current situation of performance measurement communication supporting lean production in SMEs, including how the communication changes. Three research questions (RQs) are formulated:

RQ1: What is the current practice concerning performance measurement communication

supporting lean production in SMEs?

RQ2: What is the current practice of performance measurement follow-up to support lean production in SMEs?

RQ3: What is the role of performance measurement communication when improvement initiatives are formed to support lean production in SMEs?

The second phase of the research is the doctoral study, which continues on the licentiate study. The research questions for the doctoral thesis are for the time being preliminary, and can be adapted to the result of the licentiate research. Also this part is divided into three questions:

RQ4: How and when should performance measurement be communicated to support lean production in SMEs?

RQ5: How and when should performance measurement be followed-up to support lean production in SMEs?

RQ6: How should performance measurement results be connected to improvement initiatives to support lean production in SMEs?



YU LIU

LANGUAGES English, Chinese, Swedish

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Anna Syberfeldt (University of Skövde), Co-supervisor: Matias Urenda Moris (University of Skövde), Mats Jägstam (Jönköping University).

EXPECTED COMPLETION OF PHD 2020

RESEARCH INTERESTS Environmental impact assessment, Life cycle assessment, Production flow simulation.

BACKGROUND MSc in Energy and Environmental Systems and Technology, Chalmers University of Technology, Göteborg, Sweden. BSc in Environmental Science, Tianjin University of Science and Technology, Tianjin, China.

Production Flow Simulation based Life Cycle Assessment.

The aim of the project is to develop a methodology to evaluate the environmental performance of production processes by means of Life Cycle Assessment (LCA) approach. The project contributes to sustainable development and intend to support reduction of the environmental impact in production.



BJÖRN BERG MARKLUND

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Henrik Engström (University of Skövde), Co-supervisor: Per Backlund (University of Skövde).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Game development, serious games, research methodologies, educational games, game design, children's gaming behavior.

BACKGROUND 1 Year Msc in Serious Games, University of Skövde, Sweden. BSc in Game Design, University of Skövde, Sweden.



IMAN MORSHEDZADEH

LANGUAGES English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Amos Ng, primary supervisor: Jan Oscarsson.

EXPECTED COMPLETION OF PHD 2020

RESEARCH INTERESTS Product lifecycle management (PLM), Product and process development, Virtual manufacturing, Product data management (PDM), Automation engineering.

BACKGROUND MSc in Automation engineering, University of Skövde, Sweden; BSc in Industrial engineering, Azad university of Kerman, Iran.

Games in Formal Educational Settings: Obstacles for the development and use of learning games

My thesis focuses on understanding how educational games work when they are actually put inside of formal educational environments. During the research that led to my licentiate thesis (defended in November, 2013), I found that there were many incongruities between the literature on educational games and developers' and educators' experiences working with them. The research on educational games I was reviewing was rarely backed by empirical findings, and seldom discussed the obvious problems inherent in trying to use games in formal education. During my own field work, the issues I encountered were rarely described in previous research, which led me to direct my research efforts into understanding them better.

As a result of this change in direction, my recent publications has primarily focused on describing the challenges of catering to the heterogeneous classroom audience, the practical considerations one needs to be aware of when either developing or using educational games, and the responsibilities that classroom gaming places on teachers. The general outcomes of the research so far has been to identify the challenges that formal education presents for game usage – for example the

often lacking technological infrastructures of schools, the low gaming literacy of teachers, and the challenge of creating games and game assignments that can simultaneously engage both novice and expert game players. My doctoral thesis will continue describing the details of the identified challenges of educational games use and development, but will also describe how deliberate accommodation for the conditions encountered in formal education as a gaming space can lead to successful educational games projects – both for educators and developers.

Efficient use of product lifecycle management (PLM) for integrated product and process development

Integrated product and process development is one of the main issues in a live business, and companies try to shorten product development time. This not only to reduce costs, but also to catch market opportunities. Different varieties of products make the product development more complicated, and product life cycle management systems try to shorten the time to market.

For this research, the process phase of product lifecycle will be surveyed, and the role of process data in product development will be clarified. Process data has been generated in different engineering software programs and this research tries to clarify them as the first step, and specify their roles and effects in product development.

This research tries to use the PLM system as a platform to improve an integrated product and process development, according to the mentioned data.

The aim of this project is to introduce an applicable procedure, to use process data for the optimization of product development.



ULRIKA OHLANDER

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Göran Falkman (University of Skövde), Co-supervisor: Maria Riveiro (University of Skövde).

EXPECTED COMPLETION OF PHD 2018

RESEARCH INTERESTS Team collaboration, team efficiency, distributed decision making, data visualization.

BACKGROUND MSc Mechanical Engineering, Industrial PhD-student from Saab Aeronautics in Linköping.

Methods to Design and Develop Pilot Decision Support Systems Contributing to Enhanced Team Performance

The overall aim with this research is to contribute to enhanced team performance in the fighter aircraft domain. This will be achieved through establishing methods for the design and development of Decision Support Systems (DSSs) that better support team performance in this domain. The research aims for two deliverables that will contribute to better design and evaluation of DSSs for team performance. The receiver of these deliverables is a design and development organization of DSS for fighter aircraft. The first deliverable will be a set of design guidelines to be used early in the design process. The second deliverable will consist of a tailored evaluation method that will be used during evaluation of DSSs in a tactical flight simulator. The evaluation method will probably consist of a variety of measurements, such as individual assessments, observations, logging of data and events etc. In order to be useful in an industrial setting the method need to be as unobtrusive as possible and simple enough to apply.



ANNA PFISTER

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Bioscience.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Afrouz Behboudi (University of Skövde), Co-supervisor: Björn Olsson (University of Skövde), Pierre Aman (University of Gothenburg).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Tumor Biology, Bioinformatics, Genetics, Method development.

BACKGROUND MSc in Biomedical Sciences, Linköping University, Linköping, Sweden.

Identification and characterization of novel biomarkers in tumorigenesis of endometrial cancer

The motor protein myosin 1C has recently been shown to have tumor suppressor activity in vitro and is implicated in the development of endometrial carcinoma in vivo. This research will explore how this might be possible and will therefore analyze the different ways in which myosin 1C affects the regulatory pathways of the cell. To this end the mRNA for myosin 1c will be knocked down in a cell line and the overall mRNA expression will be examined on a microarray platform. The changes in expression will be monitored over time and analyzed bioinformatically for patterns of change relating to specific pathways and gene ontologies. Furthermore, bioinformatics tools will be used to identify possible biomarkers which are differentially expressed in the absence of myosin 1C and may have an effect on tumorigenesis.

The biomarkers will be validated experimentally using the golden standard methodology on both the original cell line and on tumor material from endometrial cancer tissue in different stages of development. This approach will allow us to make a systematic validation of our previously identified candidate markers, as well as to identify new cancer regulatory markers.

The aim of this research is to elucidate which pathways are affected by the deprivation of myosin 1C and therefore involved in its signaling pathways as well as identifying novel biomarkers that are important for cancer progression in endometrial cancer.



AMINUR RAHMAN

LANGUAGES English, Bengali, Swedish

FACULTY OR DEPARTMENT School of Bioscience, section Molecular Biology.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Abul Mandal, (University of Skövde), Co-supervisor: Jana Jass, (Örebro University).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Genetic Engineering, Bioinformatics, Environmental pollution, Bioremediation of toxic metals.

BACKGROUND B. Sc in Biochemistry and Molecular Biology (2008), University of Rajshahi, Bangladesh. M. Sc in Molecular Biology (2010), University of Skövde, Sweden. M. Sc in Biomedicine (2011), University of Skövde, Sweden.

Bioremediation of toxic metals and other pollutants for protecting human health and the ecosystem.

Bioremediation is the utilization of biological processes for detoxification of various environmental hazardous wastes. Constant release of toxic metals (such as arsenics, chromium, lead etc.) in water by anthropogenic activities contributing to global environmental pollution is a severe threatening for human health and the ecosystem. The majority of the chemical substances is human carcinogens and can severely impact human health, resulting in neurological and vascular disorders, and system-wide organ damage or failure. Therefore, the practical impact of this project is to protect millions of people and their environment from lethal contamination with the effluents disposed from the industries.

The main objective of this research is to develop sustainable and cost effective methods for the degradation of toxic chemicals originating from anthropogenic sources such as industrial wastes, and thus protecting people worldwide from severe lethal diseases. The PhD project relies on directed evolution to develop novel bacterial strains that can be used for degradation or reduction of the toxic substances in the ecosystem. Directed evolution is the gradual selection of individual organisms to further proliferate, and thus evolve to cope

with particular environmental stresses.

In addition to human health and its socio-economic consequences resulting from exposure of human to toxic chemicals, my thesis affect many other important environmental issues world-wide. The thesis also attempts to contribute to the health of wild and domestic animals from consuming contaminated fodder (straw, grass, vegetables etc.), and thus contributing to further protection of human health from severe poisoning through meat-milk pathway.



HANIFE REXHEPI

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Informatics, Information Systems.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Professor Anne Persson (University of Skövde), Co-supervisor: Rose-Mharie Åhlfeldt (University of Skövde).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Health Informatics; Knowledge Management; Patient Empowerment; Business Process Management; Internal medicine.

BACKGROUND MA in Information System Development, University of Skövde; BSc in Nursing, University of Skövde; BSc in Information System Development, University of Skövde.

Process-Oriented Information Systems to Support Evidence Based Medicine.

Delivering good quality care is a complex endeavor that is highly dependent on patient information and medical knowledge. When decisions about the care of a patient are made they must as far as possible be based on research-derived evidence rather than on clinical skills and experience alone. Evidence based medicine (EBM) is the conscientious and judicious use of current best medical evidence in conjunction with clinical expertise and patient values and preferences to guide healthcare decisions. Practicing EBM is, however, challenging. One of these reasons is the absence of information systems that support a seamless flow of patient information along the care process. This is highly disturbing since, the traditional single doctor-patient relationship is increasingly being replaced by one in which the patient is managed by a team of healthcare practitioners, each specializing in one aspect of care. Such seamless and shared care depends critically on collaboration and on the ability to share information easily between care providers. The practice of EBM is further complicated as it is nearly impossible for practitioners to search and evaluate current evidence in everyday clinical care. Care questions often remain unanswered because

clinicians cannot find answers during the patient encounter. Therefore, this thesis aims to provide solutions for how a future healthcare information system can support the practice of EBM by improving the availability of patient information and medical knowledge in a way that seamlessly integrates with healthcare practitioners work practice. Since safety and quality of care are strongly related to patient engagement, this thesis also aims to find solutions to how patient engagement can be enhanced through improved provider-patient communication.



BERNARD SCHMIDT

LANGUAGES Polish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Lihui Wang (KTH and University of Skövde), Primary supervisor: Diego Galar (University of Skövde).

EXPECTED COMPLETION OF PHD 2017

RESEARCH INTERESTS Condition-based Predictive Maintenance, Cloud Manufacturing, Human-Robot Collaboration.

BACKGROUND MSc in Automatics and Robotics, AGH University of Science and Technology, Cracow, Poland.

Condition Based Maintenance of Manufacturing Asset for Failure Prediction and Prevention.

Maintenance of assembly and manufacturing equipment is crucial to ensure productivity, product quality, on-time delivery, and a safe working environment.

This research analyses how Predictive Maintenance activities for one machine can be improved by utilising information from multiple similar machines. This include investigation of what data and information are required and how the data and information from different sources and of different kinds can be integrated in a useful way for the predictive maintenance purpose.

The main aim of the research is to improve condition-based Predictive Maintenance by context awareness using the largest information content possible – a maximum content in a factory or in-between factories. However novelty is not in the amount of data but in the variety of data sources and the approach to gathering, processing and utilising the information according to the Cloud-based concept. It could also be a better solution economically compared with existing working manner based on multiple stand-alone systems and island type of data collection and decision making.



FLORIAN SIEGMUND

LANGUAGES German, English, Swedish

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Primary supervisor: Kalyanmoy Deb (Michigan State University), Main supervisor: Amos H.C. Ng (University of Skövde).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Nature-inspired heuristic optimization algorithms, Noisy optimization, Simulation, Decision Support.

BACKGROUND MSc/BSc in Computer Science, Operations Research/Business Administration, Karlsruhe Institute of Technology, Germany.

Dynamic Resampling for Preference-based Evolutionary Multi-objective Simulation Optimization of Stochastic Systems.

This research analyzes the application of Dynamic Resampling algorithms in stochastic Simulation-based Optimization. Models of complex real-world systems are often stochastic and require long simulation times. Reliable quality assessment of system configurations is often done by simulating and evaluating them multiple times, using expected performance values. Since this Dynamic Resampling procedure of stochastic models requires many time-consuming simulation runs it is crucial to stop the repeated evaluation of configurations when the required objective accuracy is reached. In other words, the purpose of a Dynamic Resampling algorithm is to achieve an optimal distribution of the available samples among the competing system configurations. In multi-objective Simulation-based Optimization the available number of configuration evaluations is limited, and if preference information is given by a domain expert, guided multi-objective optimization algorithms can be used. These algorithms focus on the preferred area in the multi-dimensional objective space and can thereby achieve a better result within the available optimization time.

The thesis will explore the possibilities to define Dynamic Resampling strategies that exploit the extra information that is available in guided Evolutionary Multi-objective Optimization (EMO), given by the preferences of a decision maker. In Preference-based EMO algorithms, the distance and progress of the solution population to the preferred area in the objective space are promising resampling criteria. The research work includes the implementation of a Dynamic Resampling framework and the integration of the proposed algorithms in an existing optimization cluster software. The algorithms are evaluated on real-world simulation optimization problems in production automation and logistics applications.

The aim of the research is to develop Dynamic Resampling algorithms for Preference-based EMO algorithms, that allow for distance and progress-based sampling allocation. For this purpose, existing Preference-based EMO algorithms are extended to cooperate better with Dynamic Resampling algorithms and to make their application more beneficial. In addition, adaptive Preference-based EMO algorithms are created that can focus better and converge faster on the area preferred by the domain expert and decision maker.



PILLERIIN SIKKA

LANGUAGES English, Estonian, Finnish

FACULTY OR DEPARTMENT Department of Cognitive Neuroscience and Philosophy, School of Bioscience, University of Skövde and Centre for Cognitive Neuroscience/Department of Behavioral Sciences and Philosophy, University of Turku, Finland.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Antti Revonsuo (University of Skövde and University of Turku, Finland); Co-supervisor: Dr. Katja Valli (University of Skövde and University of Turku, Finland).

EXPECTED COMPLETION OF PHD 2016/2017

RESEARCH INTERESTS Psychological and neural basis of altered states of consciousness (dreaming and hypnosis); Psychological and neural basis of positive states of consciousness (happiness and well-being).

BACKGROUND MSc in Neuroscience, University of Oxford, UK; MSc in Psychology, Tallinn University, Estonia; BSc in Psychology, Tallinn University, Estonia.

The Neurocognitive Basis of Dream Emotions

Emotions are of great importance in dream research, as dreaming, especially REM sleep dreaming, is characterized by an increased amount and intensity of emotions. Moreover, emotion plays a central role in a number of functional theories of dreaming (e.g., Revonsuo, 2000). The overall aim of the PhD project is to investigate the psychological and neural basis of dream emotions. More specifically, the objective is to study (1) the effects of methodological differences in how dream emotion data are acquired and analyzed on the emotional content of dream reports; (2) the specific neurophysiological correlates of emotional content of REM sleep dreaming; and (3) the relationship between waking state mental well-being and dream emotional content.



DANIEL SVENSSON

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Ulf Stigh, Co-supervisor: Svante Alfredsson.

EXPECTED COMPLETION OF PHD June 2015

RESEARCH INTERESTS Fibre compressive failure and delamination in carbon/epoxy composites.

BACKGROUND B.Sc. Mechanical engineering (University of Skövde). One year M.Sc. Applied mechanics (University of Skövde). Lic. Eng. Applied mechanics (Chalmers University of technology).

On Cohesive Modelling of Carbon/Epoxy Composites – Delamination and Fibre Compressive Failure

Carbon Fibre Reinforced Polymers (CFRP) are widely used in engineering applications where weight saving and high mechanical performance are key factors. However, an inherent weakness of laminated CFRP's is their relatively low resistance to delamination. That is, the plies of the laminated CFRP separates from each other. Delamination growth is a major concern in the aeronautical industry since it is difficult to detect during a routine inspection and it may severely reduce the load carrying capacity of the laminate.

The first part of this thesis is devoted to methods to extract cohesive laws associated with delamination. The method is based on fracture mechanical tests and measurement of the displacement field close to the crack tip. Pure mode cohesive laws are determined by an optimization procedure involving finite element (FE) simulations. An initiation based formulation allows for a straight forward determination of the mixed mode cohesive law. FE simulations show that the fracture loads and local displacements are in good agreement with the experiments.

The second part of the thesis is concerned with mixed mode cohesive modelling under small scale yielding conditions. Under such loading conditions, a robust cohesive model should conform to the predictions of linear elastic fracture mechanics. Both isotropic and orthotropic adjacent continua under plane stress or plane strain are treated. By analytical derivations, it is concluded that two conditions are sufficient for mixed mode cohesive laws to achieve this property.

The third part of the thesis focuses on a failure type entirely different from delamination: longitudinal compressive failure. The objective is to extract the cohesive law associated with kink-band formation. Equilibrium of configurational forces is used for this purpose. Identified configurational forces are continuously measured by monitoring the displacements field on the specimen's lateral surface. The kink-band is formed in the intended region of the specimen and the evaluation shows a peak stress and fracture energy in the anticipated ranges.



BENJAMIN ULFENBORG

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Bioscience.

SUPERVISORS AND THEIR AFFILIATION Main supervisors: Karin Klinga-Levan and Björn Olsson (University of Skövde).

EXPECTED COMPLETION OF PHD 2016

RESEARCH INTERESTS Cancer, biomarker discovery, non-coding RNAs, machine learning, algorithm development.

BACKGROUND MA in Molecular Biology, University of Skövde, Sweden.

Computational approaches to discovery of biomarkers for cancer diagnosis and prognosis

Cancer is a complex disease, which derives from inappropriate behavior of cells in an organism. By sustaining various genomic alternations, e.g. mutations and chromosomal rearrangements, cells experience changes to the processes regulating their life and death decisions. These changes may endow the cells with proliferative advantages over normal cells, such as self-sufficiency of growth factors, evasion of cell death and infinite replicative potential. The accumulation of genetic changes over several cell generations may culminate in the formation of an abnormal cell mass called a tumor that eventually spreads to distant parts of the body through metastasis.

To complement current approaches to diagnostics and prognostics, one current focus of cancer research is to find biomarkers. A biomarker is a biological molecule found in tissues or body fluids and is indicative of a normal or abnormal process, such as a disease. Cancer is caused by genetic aberrations, which results in altered expression of proteins and other molecules in the cell. Since these perturbations are responsible for the transformation of normal cells to cancer cells, the presence of mutations and altered expression

levels can be indicative of tumor presence, progression and therapy responsiveness. New cancer biomarkers serve as a promising complement to current diagnostic and prognostic practices with the prospect of earlier and less invasive diagnoses, prediction of response to therapy and more confident prognoses.

The aim of this thesis is to develop computational methods for the discovery and analysis of novel cancer biomarkers. This is motivated by the fact that, with the development of new technologies to measure genomic changes and biomolecular levels, the amount of biological data available has dramatically increased. The large datasets generated require the application of computational methods to be analyzed systematically and comprehensively. One of the methods developed in the thesis is called the Decision Trunk Classifier and is designed to identify potential biomarker candidate genes from large gene-expression datasets.



TOMAS WALANDER

LANGUAGES Swedish, English

FACULTY OR DEPARTMENT School of Engineering Science, University of Skövde, Applied Mechanics Chalmers University of Technology.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Ulf Stigh (University of Skövde), Co-supervisor: Anders Biel (University of Skövde).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Mechanics of materials, Strength of adhesive layers, Finite Element simulations.

BACKGROUND B.Sc. Mechanical engineering (University of Skövde). One year M.Sc. Applied mechanics (University of Skövde). Lic. Eng. Applied mechanics (Chalmers University of technology).

Influences of temperature, fatigue and mixed mode loading on the cohesive properties of adhesive layers

The thesis is about strength of adhesive layers. It deals with influence of temperature, fatigue and mixed mode loadings. The results of the studies are used to create finite element models that can be used to simulate the mechanical behaviors of adhesives under these considerations.



KITTICHATE VISUTTIJAI

LANGUAGES English, Thai, Swedish

FACULTY OR DEPARTMENT School of Bioscience.

SUPERVISORS AND THEIR AFFILIATION Main supervisor: Afrouz Bebouli (University of Skövde), Co-supervisor: Karin Klinga Levan and Katarina Ejeskär (University of Skövde); Anders Oldfors (University of Gothenburg).

EXPECTED COMPLETION OF PHD 2015

RESEARCH INTERESTS Tumor biology, cell biology, cell signaling, human genetics.

BACKGROUND BSc (Pharmacy) Chulalongkorn University, Bangkok, THAILAND.
MS (Biomedicine) University of Skövde, Skövde, SWEDEN.

Molecular and functional characterization of INPP5K and MYO1C candidate tumor suppressor genes in cancer

A minimal region of recurrent deletion/allelic loss at the neighborhood of the Tp53 gene was identified in an experimental model for endometrial carcinoma (EC). This finding was intriguing, since similar observation of deletion at the homologous position on human chromosome 17 unassociated with TP53 mutation has been reported in quite a few human tumor types. An important tumor suppressor activity located close to, but distinct of TP53 is thus suggested. In a comparative genomic approach the candidate region was narrowed down to a smallest segment harboring 16 known and three predicted genes. Using quantitative real-time PCR for all the 19 genes in a panel of experimental ECs and control samples, Myo1c (myosin 1C) and Inpp5k (inositol polyphosphate-5-phosphatase K) were singled out as the best candidates. In light of these findings, my PhD research project aims: (1) to assess role(s) of INPP5K and MYO1C tumor suppressor gene candidates in cellular function, and (2) to examine molecular pathway(s) through which these genes may contribute to tumorigenesis.

To address the first goal, this thesis investigates functional significance of INPP5K and MYO1C in cellular phenotypes such as cell

proliferation, migration, and adhesion. To address the second goal, the potential crosstalk between these two candidate proteins and PI3-kinase/AKT cell proliferation and survival pathways is analyzed by looking into the influence of up- and down-regulation of INPP5K and MYO1C on the protein expression of members of these pathways in cell lines and clinical cancer samples. In addition, to explore potential effects of MYO1C expression on other cancer-related pathways, in a transcriptomics approach, a recently developed 3D microarray platform is used to study time-dependent expression pattern of 25,000 genes in response to MYO1C knock-down during 0 to 72 hours post siRNA transfection. Taken together, for the first time, the proposed work has a very good potential to provide supporting evidence for tumor suppressor features of INPP5K and MYO1C.

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