

# Thesis Supervisors and Topics in Information Processing Science

Supervisors' email addresses are [firstname.lastname@oulu.fi](mailto:firstname.lastname@oulu.fi)

## Umar Farooq

- Natural Language Processing (NLP)
- Sentiment Analysis, Opinion Mining and Emotional Mining
- Social Media Analytics
- Machine Learning, Deep Learning
- Reputation System, Reputation Model and Recommendation System

## Aryan Firouzian

- Design Science research method (Innovating information and communication technology)
  - Prototyping & HCI design
  - Assistive and Wearable technologies (Navigation Tools, Smart Devices, Telepresence System)
  - Serious Gaming

## Cassandra Grundstrom

- Data: barriers, adoption and diffusion, open data, healthcare data
- Sociomateriality: frameworks, theory, applications, use as a lens
- Information Security Management
- Case studies: in public and government organisations
- User-experiences evaluations: both empirical and theoretical

## Raija Halonen

- e-Inclusion (general topic) (ICT (IT) ja sosiaalinen inkluusio)
- ERP implementation (toiminnanohjausjärjestelmän toteutus/käyttöönotto)
- Challenges in implementing ICT in organisations (informaatioteknologian käyttöönoton haasteet organisaatioissa)
- Serious games / Gamification in different contexts (vakavat pelit / pelillisuus erilaisissa yhteyksissä)
- Health and social wealth supported by ICT in its different forms / ICT in health and/or social wealth sector (ICT:n tukema terveys ja sosiaalinen hyvinvointi eri muodoissa)
- Knowledge creation/support/transfer in organisations (tietämyksen siirtäminen organisaatiossa)
- Inter-organisational information systems (organisaatioiden väliset tietojärjestelmät)

- Social dynamics in ICT projects (ihmisten kokemukset ja yhteistyö ICT-projekteissa)
- Social media (in any context)
- ICT & elderly / ICT & disabled / ICT & minorities (ICT ja vanhukset / ICT ja vammaiset / ICT erilaisten vähemmistöryhmien käytössä/näkökulmasta)
- Challenges in communication with ICT (IT-tuetun kommunikation haasteellisuus)
- “You-name-it” (Ehdota oma aihe)

## Heidi Hartikainen

- Maker movement and digital fabrication, makerspaces, fablabs
  - Making in schools, focus on teachers or children
  - 2D and 3D design (TinkerCad, Fusion360 etc), 3D printers, programming, robotics
- Children and teenagers as IT/Internet users
- Social media and web 2.0
  - Social networks, instant messaging, content creation, virtual worlds (gaming and social)
  - Facebook, ask.fm, WhatsApp, Instagram, Youtube, SecondLife, WoW etc.
- Online safety and information security
- Threats to online safety
  - Content threats (e.g. spam, violence),
  - Contact threats (e.g. bullying, grooming),
  - Conduct threats (e.g. illegal file sharing)
  - Computer threats (e.g. malware, phishing)
- Online safety mediation
  - Industry mediation (e.g. content screening, privacy policies),
  - Technology (e.g. parental controls, adblockers),
  - Policies and educational efforts (e.g. KiVa koulu, Better internet for Children)
  - Social mediation by parents, teachers
- Qualitative research

## Henrik Hedberg

- All topics related to Open Source Software, such as
  - Usability in Open Source Software Projects
  - Quality Assurance Methods in Open Source Software Projects
  - Company Participation in Open Source Software Development
  - Open Source Software Development Communities
- Declarative Programming Languages, Functional Programming
- Constructive / design science research in software engineering discipline

## Juha Iisakka

- Käsitteellinen mallintaminen, ontologia
- Innovaation diffuusio -teoria ja sen soveltaminen
- EU-tietosuojadirektiivin vaikutus henkilörekistereihin.

- Metamallinnus UML:ssä
- NewSQL-tietokannat
- NoSQL-tietokannat
- *Kesätyöstä voi tehdä LuK-työn*

## Netta Iivari

- Children and IT
- Technology-rich everyday life
- User-centered design
- Participatory design
- Usability
- Cultural aspects
- Open source software development
- Community-based design
- User innovation

## Minna Isomursu

- IT based services - combining IS and service design/science
- Validation of IT based services, evaluation of value of IT based services in context
- Specific topics:
  - Adoption/use of digital services during pregnancy and maternity, e.g. adoption barriers in selected areas/for selected target groups, such as families in certain geographic area (e.g. Norway or Brazil or whatever) or mothers with drug addictions etc. This is kind of market analysis/IS adoption type of research. Any ideas for new digital services to be used during pregnancy or maternity – development and validation of your own idea. Design research type of work
  - Use of digital footprint for health (or replace health with you own interest parameter), E.g. use of shopping data for increasing understanding of your health behaviour/some other parameter. For example, you can download your shopping data from S-group, and build visualizations and other constructions to create refined understanding of your behaviour. Design research type of work. You can use also some other data source, or combinations of data sources.
  - Systemic aspects of behavior change. Methods for how to support behavior change through system design, i.e. systemic solutions for tackling loneliness, systemic solutions for supporting health behavior, systemic solutions for decreasing carbon emissions. Focus on system parameters, such as norms, laws, infrastructures...

## **Antti Juustila**

- Software engineering
- Mobile systems and programming
- Software architectures

## **Pasi Karppinen**

- eHealth & wellness
- Behaviour change support systems
- Persuasive technology
- Flow experience
- Habit formation
- Ethics
- Qualitative methods
- Design methods for information systems
- Pedagogy

## **Marianne Kinnula**

- (Verkko)pelaaminen / (Online) games
- Lapset ja tietoyhteiskunta / Children in media society
- Verkko yhteisöt/Yhteisöllisyys verkossa / Online communities
- Teknologian suunnittelu lapsille / Designing technology for children
- Children's participation in technology design and adaptation
- Digital natives
- Everyday life in technology-rich (neo-)communities
- Teknologian rooli lasten kasvamisessa aktiiviseksi kansalaisiksi / Technology support in active citizenship (of children)
- Teknologian käyttö arkipäivässä, eri näkökulmista, eri ikäryhmillä (myös aikuiset), eri konteksteissa esim: Lapset/nuoret mobiililaitteiden (tai yleensä teknologian) käyttäjinä / Technology use in everyday life
- Kaikkia aiheita voi lähestyä joko liiketoimintanäkökulmasta tai käyttäjän näkökulmasta / Both business or user viewpoints can be used

## **Olli Korhonen**

- Topics related to service personalisation, such as
  - Personalization in health domain (applications, services, techniques)
  - User experience & evaluation of personalised services

## **Arto Lanamäki**

- Digital transformation of industries, particularly concerning taxi industry / Toimialojen digitaalinen transformaatio, erityisesti liittyen taksialaan
- Digital platforms / Digitaaliset alustat
- Sharing economy / Jakamistalous

- IT and strategic change / Tietotekniikka ja strateginen muutos
- Online communities / Verkkoyhteisöt
- Online participation, social media / Verkko-osallistuminen, sosiaalinen media
- Organizational routines and IT / Organisaatiiorutiinit ja tietotekniikka
- IT-mediated collaboration / IT-välitteinen yhteistyö
- Qualitative studies of IT use / Tietotekniikan käytön laadulliset tutkimukset
- Practice theories / Käytäntöteoriat
- Wikipedia and other wikis / Wikipedia ja muut wikit

## **Jouni Lappalainen**

- Työkaluohjelmistojen arvioinnit
- Henkilökohtaiset ohjelmistoprosessit
- Tietokonepelien genret ja teknologiat
- Oppimiseen ja opettamiseen liittyvät aiheet kuten oppimisympäristöt ja ohjelmoinnin opetus

## **Kari Liukkunen**

- Distributed work and how to support it with communication tools
- Global SW development
- E-Learning
- Educational technology
- Smart environments
- Wellness

## **Jouni Markkula**

- (Personal) data intensive services and systems
- Privacy and trustCrowd intelligence, Crowdsourcing, Social media
- Community knowledge management, problem solving and decision making
- Delphi, Prediction markets, Information markets
- Service innovation in business ecosystems
- Collaborative service design
- Open data, Linked open data
- Data quality
- Organisational knowledge management
- Organisational and community communication methods and tools
- Research methodology
- Design science research
- Empirical software engineering
- Statistical data analysis in software engineering
- Experimental research settings
- Metrics and quantitative analysis methods

## **Tonja Molin-Juustila**

- Lapset ja teknologia (children and technology)
  - For master students interested to make a thesis based on empirical data collected already, please contact asap
  - The data is about brainstorming for tangible interaction with children (3rd graders)
- Teknologiarikaste arki (technology-rich everyday life)
- Osallistuva suunnittelu (participatory design)
- Osallistumisen teknologiat (technologies for participation)
- Draaman soveltaminen (lähinnä kandidityö, review)
- Multidisciplinary human/user centered development
- Activity theory (toiminnan teoria) as a theoretical framework
- Project work in ICT field

## **Mika Mäntylä**

- Bitcoin / Block chain / Cryptocurrencies
- Affective computing
- Sentiment analysis and Opinion mining
- Text mining and clustering
- Natural Language Processing (NLP)
- Software testing. In particular: Software Test Automation, Exploratory testing, Continuous Integration, Crowdsourcing in testing
- Software maintainability / evolvability / modifiability. In particular: Software Refactoring, Bad code smells, Anti-patterns, Software maintenance
- Human factors in Software engineering, e.g. Time pressure
- Software processes. In particular: Root-cause analysis, Rapid Releases
- Success and Failures in Software Engineering

## **Michael Oduor**

- Persuasive systems design and Behaviour change
- Persuasive technology
- Social Web
- Social networks / Online communities
- Use and adoption of digital services
- e-Business (Social marketing, business models etc.)

## **Harri Oinas-Kukkonen**

- Data analytics to understand user behaviors
- Artificial intelligence solutions for behavior change
- Gamification and serious games
- User behaviors
- Behavior change
- Persuasive design

- Social influence
- User experience
- Human-computer interaction
- Social web / media
- Humanized technologies
- Emerging technologies
- Medical / health informatics
- Health applications
- Sustainability / Green IT
- Open innovation
- Crowdsourcing
- Dark side of IT
- Historical research method
- For further topics, see the book "Humanizing the web: Change and social innovation."

## Markku Oivo

- Ohjelmistotuotanto
- Ketterät menetelmät (agile)
- Lean Software Development
- Prosessien arviointi ja kehittäminen
- Laadun kehittäminen ja laadunvarmistus
- CMMI, SPICE/ISO 15504
- Mittaaminen ohjelmistotuotannossa, GQM
- Hajautettu tuotekehitys
- Teknologijahtaminen
- Ohjelmistotuotannon ulkoistaminen
- Cloud software Survey in Lean and Agile Software Development
- Agile adoption survey in Finnish industry
- Startup companies
- Evolution of goal-oriented measurement approaches: literature survey
- Evolution of goal-oriented measurement approaches: interviews of main authors of GQM+Strategies
- Systematic literature surveys and mapping studies

## Petri Pulli

- Tietoliikenne- ja mobiilijärjestelmät, ohjelmistot ja palvelut
- Tuotteisiin sulautetut järjestelmät ja ohjelmistot
- Ubiikkiasiat
- Virtuaalitodellisuus ja lisätty todellisuus
- Immateriaalioikeudet, patentointi

- Vanhusten älykäs elinympäristö – tutkimusteemassa Talvi/Kevät 2014-2015 (Petri Pulli & Zeeshan Asghar)
  - Smart Glasses (Navigation, Smart Kitchen, communication situations)
  - Telepresence based guidance
  - Smart Kitchen
  - Workflow engine
  - Secure privacy-protected cloud
  - Oldbirds networked virtual environment
  - Service Robot as a home assistant
  - Social network support for elderly
  - Co-production of community services
  - Service gamification
  - Technology/UI design with elderly (Eeva Leinonen & PP)
  - Quick prototyping with elderly (Eeva Leinonen & PP)

## **Dorina Rajanen**

- For up-to-date information see: <http://interact.oulu.fi/dorina-rajanen>
- Climate change communication and action
- Sustainability topics in ICT and information systems
- Business intelligence: data mining, text mining, data visualization, and gamification in business contexts (computational and/or application aspects), data analytics, visual analytics
- Media experience: study of attention to media contents and formal features (colors, shapes, etc.), emotional appraisal in media contexts (video, games, news reading, etc.)
- User evaluation in business, media, and human-computer interaction contexts (theoretical and empirical studies)
- User experience and usability: evaluation and practices
- Psychophysiological research
- Software as a service, cloud computing: theory and applications, development, adoption, recommendation, evaluation
- Models of adoption and acceptance of technology (e.g., for wearable computing, smart homes, e- and m-health, mixed reality, etc.)
- Quantitative methods as well as design science and qualitative research methods
- Research methodologies in ICT and information systems
- Safety culture (e.g., in digital fabrication, adoption of safety culture in organizations, evaluating safety as part of usability evaluation, ergonomics)
- Instructional design



## Mikko Rajanen

- Käytettävyyteen ja peleihin liittyvät aiheet / Topics related to usability, HCI and games

## Ilkka Räsänen

- Ohjelmointia, ohjelmistotekniikkaa tai ohjelmistojen testaamista sivuavat aiheet

## Piiastiina Tikka

- Behaviour change and persuasive technology
- Web and social media: human behaviour and actions in the Web
- Design science research, particularly on persuasive technology
- Persuasive systems design
- Gamification
- Experimental research

## Ari Vesanen

- Matemaattisluonteiset aiheet tai sopimuksen mukaan.
- Kokoavat jäsentäjät (LR parsers): Ohjelmointikielen jäsentäjä (parser) toimii ohjelman syntaksin tarkistajana. Tutkielmassa selvitetään LR-jäsennyksen toimintaperiaate ja verrataan sitä osittavaan jäsennykseen.
- Lukkiutumistilanteiden käsittely käyttöjärjestelmissä.
- Rinnakkaisten ohjelmien suorituskyvyn mittareista: ([http://www.tol.oulu.fi/~avesanen/Rinn\\_Ohjelm/Luennot/Kalvot/JohdantoRO.pdf](http://www.tol.oulu.fi/~avesanen/Rinn_Ohjelm/Luennot/Kalvot/JohdantoRO.pdf) - Suorituskyvyn mittareita).
- Lineaarinen ohjelmointi: Lineaarisessa ohjelmoinnissa on kysymys optimointiongelmasta, jossa maksimoitava tai minimoitava arvo on monen muuttujan lineaarinen funktio annetuilla reunaehdoilla.

## Karin Väyrynen

- Topic area 1: Software business (e.g. marketing in sales, management and leadership, business models, ...)
- Topic area 2: Global virtual teams
- Topic area 3: Business process management
- Topic area 4: Knowledge management, social media, online collaboration
- Topic area 5: ICT and organizational change
- Ohjaus myös suomen kielellä.