

# Department of Computer Information Science

## Masteroppgaver 2018

Marker valg for å avgrense hvilke oppgaver som skal vises.

### Hovedprofil / Studieretning

#### Datateknologi (503)

- Databaser og søk (62)
- Kunstig intelligens (136)

#### Informatikk (325)

- Programvaresystemer (86)
- Databaser og søk (52)
- Kunstig intelligens (126)
- Interaksjonsdesign, spill- og læringsteknologi (61)

#### Helseinformatikk (14)

- Helseinformatikk (14)

#### Information Systems (71)

- Information Systems (69)

#### Datateknologi (503)

- Digital virksomhetsutvikling (43)
- Interaksjonsdesign og spillteknologi (68)
- Programvareutvikling (90)
- Algoritmer og HPC (43)
- Datamaskiner og systemprogramvare (31)
- Visuell databehandling (28)

### Faglærere (25)

- |   |  |   |  |
|---|--|---|--|
| <input type="checkbox"/> D. Ahlers (1)    | <input checked="" type="checkbox"/> M. Jaccheri (10) | <input type="checkbox"/> H. Nguyen (4)    | <input type="checkbox"/> T. Theoharis (3)  |
| <input type="checkbox"/> T. Dingsøy (1)   | <input type="checkbox"/> M. Jahre (3)                | <input type="checkbox"/> M. Nygård (2)    | <input type="checkbox"/> H. Trætteberg (8) |
| <input type="checkbox"/> M. Divitini (13) | <input type="checkbox"/> J. Krogstie (12)            | <input type="checkbox"/> S. Petersen (5)  | <input type="checkbox"/> G. Tufte (3)      |
| <input type="checkbox"/> A. Elster (6)    | <input type="checkbox"/> J. Li (12)                  | <input type="checkbox"/> G. Sindre (3)    | <input type="checkbox"/> P. Öztürk (7)     |
| <input type="checkbox"/> B. Gambäck (10)  | <input type="checkbox"/> F. Lindseth (5)             | <input type="checkbox"/> M. Själander (6) |  |
| <input type="checkbox"/> J. Gulla (4)     | <input type="checkbox"/> E. Monteiro (5)             | <input type="checkbox"/> D. Svanæs (5)    |  |
| <input type="checkbox"/> S. Hvasshovd (4) | <input type="checkbox"/> L. Natvig (1)               | <input type="checkbox"/> R. Sætre (2)     |  |

Vis oppgaver

Sorter etter: Oppgave ▼

## Oppgaveforslag (10)

### Computational thinking and coding for K-12 education - Co-Supervisor: Sofia Papavlasopoulou

Computational thinking and coding is gradually becoming an important part of K-12 education. Currently, educators are leveraging a variety of digital tools, programming environments and various

making activities that can provide challenging and dynamic learning experiences to students.

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## Distributed interfaces and cooperative gaming. A case study for a storytelling game - co-supervisors Dr. Javier Gomez and Dr. Kshitij Sharma

Ability to empathise with others has been identified as one of the key factors for high quality teamwork and high academic achievement. It has also been identified as a “must possess” quality in various positions in industry (specifically software industry) ranging from the team leader to programmer/tester and quality managers. This projects aims to find the relationship with individuals' empathy levels and their performance in cooperative games like storytelling. The long-term goal of this project is to improve the ability to “walk in other’s shoes” by continuous intervention activities with storytelling.

This project arises from the Tappetina’s Empathy game (a prototype developed by other student at NTNU). In this game, users are asked to cooperate to create a story, based on the cues that the game offers. To do that, mobile phones are employed as displays to follow the story and the instructions.

In this case, the aim is to improve and study the user experience by distributing the information about the different parts of the gameplay among the users’ phones and one shared display.

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## DNV GL Fuel Fighter - software engineering issues

DNV GL Fuel Fighter participates in the international competition Shell Eco-Marathon, where the challenge is to create the most energy-efficient car. This year we have a focus on optimization and want to exploit sensor data and IoT to create an optimized driving strategy.

This is an open problem that can be tackled in many ways and levels of complexity. Data such as power consumption, track position, speed, gearing, regenerative braking power and more can be gathered and sent through telemetry such as FiPy using MicroPython, then optimized with mathematical models or machine learning tools such as SciPy or Tensor Flow, and sent back as directions to the driver dashboard. Further, the optimization can be done to create an optimal driving strategy before the race, but could also include a real-time optimization during the race itself. In writing this project you are also automatically a member of DNV GL Fuel Fighter, and will work in a multidisciplinary team environment.

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## EMPLOYING BIG DATA FOR INNOVATIVE SOLUTIONS TO SOCIETAL CHALLENGES - Co-supervisor Ilias Pappas

The purpose of this student project (master thesis) is to contribute to with innovative practices, guidelines, and policies, which will help entrepreneurs leverage big data to better design innovative solutions for social challenges.

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## Game-inspired app for recording of outdoor physical activity (walking, hiking) for people with intellectual disabilities - co-supervisor Dr. Javier Gomez

In this MSc project, we want to develop a smartphone app that is able to record the amount of physical activity in outdoor walking, hiking, etc. The goal is to detect the amount of outdoor activity and transfer the activity measurement to the entertainment system.

We are open for different approaches to measuring physical activity, including use of step counters and gps-tracking. We plan to use Fitbit or another type of bracelet. Alternatively a smart belt. Our initial idea is to develop an app that both suggests various hiking tours (mountain tours) and walking tours/trails in urban areas. The app should include rewards / reward functions (symbols, animations, sounds, etc.), and potential gaming-like feedback, as it is important that the user gets some sort of feedback during the physical activity.

The designed setup should monitor parameters such as intensity, type of activity, etc. It is preferable that the setup will be capable of transmitting monitored data wirelessly (and possible in a real-time)

to a control unit.

The first part of the thesis project will be to identify possible software and hardware tools (smartphones, fitness/activity sensors/bracelets). This part will be done in co-operation with the project team affiliated with the project. The solution must offer the possibility for individual adjustment. The second part is to develop and test the system.

The thesis will consist of three parts:

1. Theoretical discussion of

- Existing activity trackers / fitness bracelets / stepcounters / etc. (for the target user group and user groups with reduced function levels) (state-of-the-art)
- Relevant technology (incl. smartphones, physical activity sensors)
- Evaluation criteria
- Review of relevant publications (in the research literature)

2. Specification and design of prototype system

3. Implementation and test of prototype

Co-supervisor: Javier Gomez Escribano <javier.escribano@ntnu.no>

Faglærer: [Maria Letizia Jaccheri](#)

Status: *Valgbart*

Egnet for:   

Lenke: 

## Recording physical activity on exercise bicycles for people with intellectual disabilities - co-supervisor Dr. Javier Gomez

In this MSc project, we want to develop hardware and software modules to record the amount of physical activity on an indoor, stationary exercise bicycle / ergometer bike. The goal is to detect the activity performed on the bike and transfer the activity measurement to the entertainment system. We expect that many of the users already have an ergometer bike. Thus, we cannot assume that we can use built-in monitoring sensors since there will be many sorts of bike in use. However, if a design of such add-on turns out to be too difficult, we will start with a bicycle with built-in sensors for recording the activity (e.g. Kettler C10 [1]) or we will utilize some of the commercially available wheel-on adapters (e.g. Wahoo Kickr Snap [2], Zwift Magnus Wheel-On-Bundle [3]) hooked to a regular outdoor bicycle.

It is important that the user gets some sort of feedback during the physical activity. Therefore, the designed setup will monitor parameters such as speed, cadence and power. It is preferable that the setup will be capable of transmitting monitored data wirelessly and in a real-time to a control unit (e.g. smartphone, single-board computer). The user should be rewarded when selecting heavy load on the bike and for cycling for longer periods of time, proportionally.

If possible, we want to apply computer game functionality to the bicycle, for example, by cycling through a landscape with computer game elements, receiving rewards in the form of symbols, animations, sounds, etc., during the exercise.

The first part of the thesis project will be to identify possible software and hardware tools and components needed to record physical activity on a general ergometer bike. This part will be done in co-operation with the team of engineers affiliated with the project. The solution must offer the possibility for individual adjustment. The second part is to develop and test the system.

The thesis will consist of three parts:

1. Theoretical discussion of

- Existing exercise bicycles (for the target user group and user groups with reduced function levels) (state-of-the-art)
- Relevant technology (incl. physical activity sensors)
- Evaluation criteria
- Review of relevant publications (in the research literature)

2. Specification and design of prototype system

3. Implementation and test of prototype

Co-supervisor: Javier Gomez Escribano <javier.escribano@ntnu.no>

Faglærer: [Maria Letizia Jaccheri](#)

Status: *Valgbart*

Egnet for:   

Lenke: 

## Studying the relation between empathy levels and the storytelling gameplay - co-supervisors Dr. Javier Gomez and Dr. Kshitij Sharma

Tappetina's empathy mobile game provides a framework to study the relation between empathy levels and storytelling gameplay. In this project, the idea is to study how different variables affect the game outcome, for example:

Variations on the story by changing the emotions provided by the game as cues

User engagement and story quality related to the number of turns and their emotion (positive, neutral, negative)

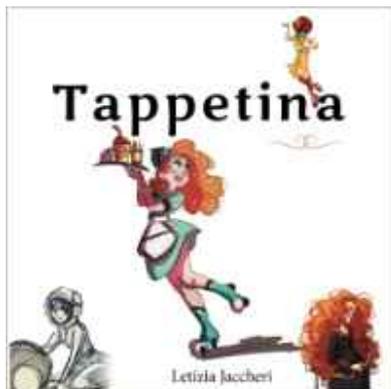
Fixed personalities (use the three personalities as an independent variable)

Different team size

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## The Little Doormaid - an interactive a fairy tale about social innovation



The [Little Doormaid](#) is a fairy tale about social innovation. The practical goal of this project is to develop and test a prototype of an interactive experience that conveys the message of the fairy tale. Development encompasses the choices of which technology and which hardware and software to use. The scientific goal of this work is to produce 1) a state of the art description of related efforts; 2) relevant research questions; 3) evaluation of the produced artefact. More information [here](#)

This thesis is connected to the IPIT (<https://ipit.network/>) project. There are possibilities to apply for grants for spending time in US at the University of Michigan.

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## TV control unit for converting physical activity reported from indoor exercise bicycles and outdoor walking/hiking app to access time to TV/movies for people with intellectual disabilities - co-supervisor Dr. Javier Gomez

In this MSc project, we want to develop a TV control unit for converting physical activity reported from indoor exercise bicycles (project 1) and outdoor walking/hiking app (project 2) to access time to TV/movies (entertainment system) for people with intellectual disabilities.

The control unit must convert the data on physical activity received from the indoor, stationary exercise bicycle / ergometer bike (project 1) and the smartphone app for recording of outdoor walking, hiking (project 2) to access time to the TV / entertainment system.

It should be possible to follow the accumulated time on the control unit and potentially also present other data like type of activity, intensity, rewards received, physical locations / whereabouts, etc. The control unit must also include functions to remotely control the TV access, etc. (This will be based on feedback from the stakeholders during the developments process.)

The first part of the thesis project will be to identify possible software and hardware tools and components needed to develop the control unit. This part will be done in co-operation with the team of engineers affiliated with the project. The solution must offer the possibility for individual adjustment. The second part is to develop and test the system.

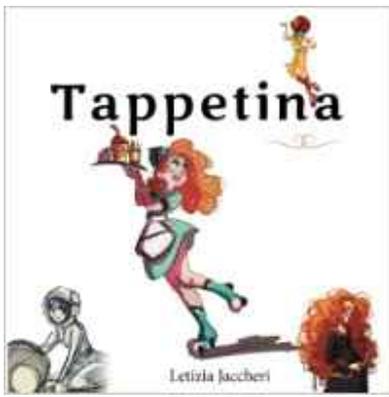
The thesis will consist of three parts:

1. Theoretical discussion of
  - Existing and relevant technology (state-of-the-art)
  - Evaluation criteria
  - Review of relevant publications (in the research literature)
2. Specification and design of prototype system
3. Implementation and test of prototype

Co-supervisor: Javier Gomez Escribano <[javier.escribano@ntnu.no](mailto:javier.escribano@ntnu.no)>

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eget for:  Lenke: 

## Zen and the Art of Storytelling - Tappetina goes to China



The [Little Doormaid](#) is a fairy tale around which a set of workshops, books, and computer games have been developed.

[ [Vis hele beskrivelsen](#) ]

Faglærer: [Maria Letizia Jaccheri](#) Status: *Valgbart* Eignet for:  Lenke: 