Presentation of available master topics

Information systems

Finding and choosing a master thesis

- Approach supervisors to discuss potential topics. There may be different angles to approach a theme than what is covered today

- December 1: Deadline for handing in study plan:
  - Which courses to take
  - Progress plan
  - Project description
  - Approved by supervisor

Presentation of available topics

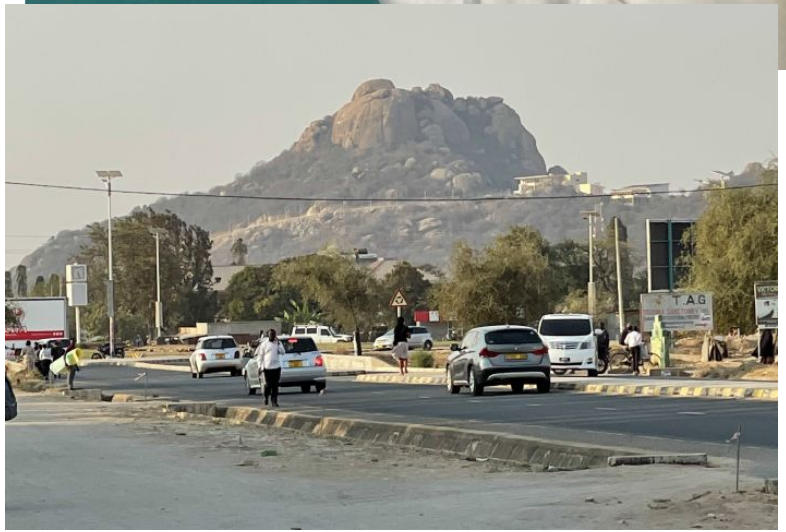
https://www.mn.uio.no/ifi/studier/masteroppgaver/is/

in addition there will be relevant topics with some other research groups

Local routine information use in Tanzania

Despite enormous success in scaling up digital information systems for data collection and reporting globally, we have little knowledge as to how this contributes to the *decision making process*

This thesis will seek to explore practices of decision making, monitoring and evaluation in Dodoma and Bahi districts, and how DHIS2 and other technologies are supporting or not such practices



<u>Supervisors</u>*:*
Johan Sæbø
Troels Mønsted

Human-AI collaboration in healthcare

The purpose of this master project is to explore the potential uses and consequences of AI-based tools in the context of healthcare. The HISP Centre, coordinating development and implementation of the DHIS2 platform, has already began exploring concrete applications of these technologies.

Master projects can engage in both design, development, and experimentation with AI-based tools as well study the use, effects, and consequences of these. Under this theme, there are several research topics available for Master theses

<u>Supervisors</u>
Johan Sæbø
Troels Mønsted
Sune Müller

This is for a group of students

Human-AI collaboration in healthcare

Potential topics:

- How can interactive chat bots, using LLMs such as ChatGPT, provide support for various users groups?
- What is affecting the use of chat bots or other AI-assisted support mechanisms?
- How can such technologies play a role in distributed development in a platform ecosystem?
- What are ethical concerns of applying AI and LLM in the context of HISP, and how can and should they be met?
- Data synthetization

Smittesporing og sykdomsovervåking - post COVID-19

1) Lærdommer og videreutvikling
   a) Hva har aktørene lært?
   b) Hva gjøres i dag?
2) Ulike aktørers behov ifm smittesporing
   a) Andre sykdommer
   b) Andre aktører
   c) I dag, ved en ny krise
3) Sammenlikningsstudie
   a) Ulike typer smittesporingsystemer
   b) Ulike land

Veiledere:
Ragnhild Bassøe Gundersen
Petter Nielsen
Johan Ivar Sæbø

Digital samhandling på tvers av behandlingsnivåer i helsetjenesten

- Et effektivt og pasient-sentrert helsetilbud forutsetter god samhandling mellom primær- og spesialisthelsetjenesten, men ikke alltid slik helsearbeidere eller pasienter opplever det
- Samarbeid med det norske e-helseselskapet Diffia
- Innovasjonsprosjekt: “Sømløs samhandling på tvers av nivåer i helsetjenesten”
- Utvikle både bedre digitale løsninger for samhandling og nye ansvarsmodeller for oppfølging av pasienter på tvers av behandlingsnivåer.

Veiledere:
Alexander Kempton
Petter Risøe (ekstern, Diffia)

Problemstillinger

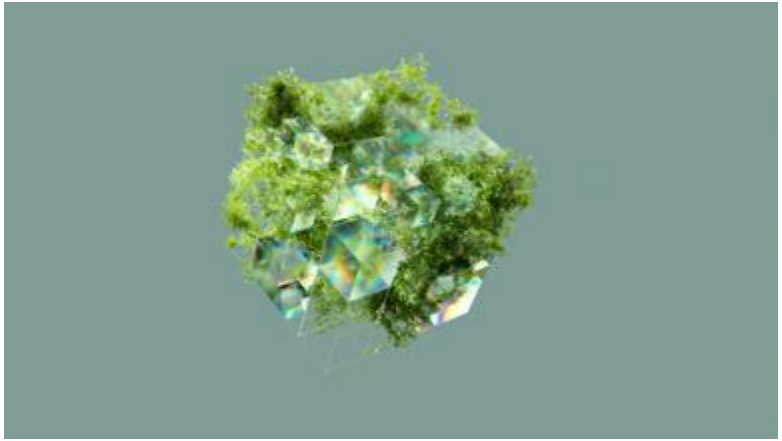
- Utfordringer ved dagens situasjon?
- Hvordan en ny ansvarsfordeling og arbeidsflyt kan forbedre samhandlingen?
- Hvordan forbedret samhandling kan understøttes digitalt?

Diffia

- Problemstilling vil defineres av student i samarbeid med intern veileder på UiO og ekstern veileder fra Diffia
- Rammene for studentenes prosjekt vil være avhengig av hvor langt det overordnede prosjektet har kommet.
- Veileder: Alexander Kempton, ekstern: Petter Risøe (Diffia)
- 1-2 studenter fra DigHel

Machine learning and climate health: Building on predictive potential?

- Climate changes pose “the biggest health threat facing humanity”.
- Help solve it through IS and machine learning research!



Supervisors:
Silvia Masiero
Sune Müller
Geir Kjetil Sandve

Machine learning and climate health: Building on predictive potential?

Master thesis project ideas include how to use machine learning to predict and mitigate:

- outbreaks of climate and waterborne diarrhea and Dengue fever
- extreme weather events (e.g., drought and flooding) and associated problems with nutrition
- sudden changes in Malaria cases due to changing weather patterns

And how to make the resulting information accessible and actionable through digital technology and the people working with it.

We welcome both non-technical and technical IS students.

Machine learning and climate health: Building on predictive potential?

With regard to the technical aspects of climate health, we are interested in developing core computational resources that can streamline the initiation, development and quality control of specific analysis in the climate health domain. Such generic computational resources include:

- Flexible simulation frameworks for generating climate health data that can guide and stress test current and future machine learning methodologies
- Software libraries for handling common tasks in climate health (machine learning) analysis
- Software platforms for integrating climate health machine learning solutions in a way that improves accessibility, interoperability, and reproducibility of the integrated solutions
- Automated benchmarks for machine learning methods in the climate health field, with appropriate selection of data sets and evaluation metrics for benchmarking

Digitalisering av gravferd i Norge

Vetle Utvik
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Statsforvaltaren
i Vestfold og Telemark

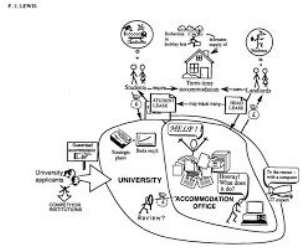
Situasjon

Digdir

- Statsforvalteren i Vestfold og Telemark og Digitaliseringsdirektoratet har ansvaret for å lage lage en digital løsning for gravferdsmelding (DGM) i Norge - skjer på papir i dag!
- DGM skal være en informasjonsplatform mellom innbygger og offentlige/private aktører (gravferdsmyndighet, gravferdsbyråer, etc)
- Er en del av regjeringens digitaliseringsstrategi
- Pilot med Oslo og Vestfold starter våren 2024

Potensielle tema (design og dighel)

- **Digitalisering i praksis** - inkludering, brukertesting, sosioteknisk design, etc
- Bruk av **digitale platformer og designsystem** i digitalisering (Altinn)
- **Sosioteknisk kompleksitet** - økosystem, interessenter, konflikt
- Fleksibel **praksis** i sykehus/sykehjem/krematorier møter **standardisering**
- Det **digitale i sorgprosesser** (innbyggere, palliative enheter/avdelinger)
- **Utforske muligheter!** (lage prototyper, utforske bruk av ulik helsedata, analysere muligheter for bedre sammenhengende tjenester,



Dette **foregår nå!**
Bidra til forskning og praksis

1-4 studenter

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Organisering av software utviklingsteam i offentlige sektor

Satsningen på intern IT-kompetanse i offentlig sektor har økt kraftig de siste årene. Eksempelvis oppgir Digitaliseringsdirektoratet “økt digital kompetanse i offentlig sektor” som ett av sine innsatsområder og flere offentlige organisasjoner har begynt å bygge opp egne IT-avdelinger som utvikler digitale løsninger basert på organisasjonens behov. Fra både praksis og forskning ser vi at software utvikling blir gjerne organisert etter agile metoder og autonome team. Men hvordan passer dette egentlig inn i offentlige organisasjoner?

Disse og lignende spørsmål er aktuelle for denne masteroppgaven:
Hvordan bør software utviklingsteam organiseres i offentlig sektor?
Hvilke utfordringer møte software team i offentlig sektor?
Hvilke roller i teamet oppstår når offentlig sektor selv utvikler digitale løsninger?
Hvordan kan tjenestekompetanse integreres i software utviklingsteam?

Mulige case: Offentlige kommunale, regionale og nasjonale organisasjoner.

Oppgaven passer for **1-2** studenter (som gjerne kan skrive sammen) fra design eller dighel.

Veileder: Johanne Thunes,
johanthu@uio.no

Making climate health data actionable in Malawi
Supervisor: Silvia silvima@ifi.uio.no

- The problem: climate change yields **cross-border effects**, but national actors need to be able to act locally to mitigate and adapt to its effects.
- Effects felt across **multiple domains**, such as vulnerability to extreme heat, climate-sensitive infectious diseases, population displacement and mobility, emergency response and preparedness.
- **Food security**: "all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life" (IFPRI, 2021)
- Wide body of research evidencing the effect of **extreme weather events** including drought, floods, erratic rainfalls, and dry spells on local, country-level and international food security.

The case: NAMIS, Malawi Ministry of Agriculture

- NAMIS (started 2019) is a platform that uses climate data to make country-wide, as well as regional and local assessments down to the household level
- **Agricultural Extension Development Officers** (AEDOs) collect the readings of weather stations and enter the data into NAMIS, using specially configured tablet devices running a custom rainfall data collection tool
- The same data is also shared with the Department of Climate Change and Meteorological Services (DCCMS) within the Ministry of Natural Resources and Climate Change, with manual registers submitted monthly
- The DCCMS relies on these records, data from other weather stations across the country and satellite data to collect and analyse statistics on rainfall, temperature, humidity and wind dynamics
- Data used to make **projections** and forecasts, which are shared as reports for specific periods: the 5-day; weekly; and seasonal weather forecasts.

The project: Making Climate Health Data Actionable

- RQ1: What is the status of current **data use practices** within NAMIS, especially in relation to the integration of climate and food security data?
- RQ2: How can the necessary climate data best be **integrated and visualised** through DHIS2 in order to support climate health action?
- 4-6 week fieldwork in Malawi – focus on the direct experience of actors, primarily Agriculture Development Officers and Agriculture Managers
- Expected contribution: discovering paths to **making climate health data actionable** through work conducted through digital platforms.

Improving work processes and logistics at a hospital using visual data simulations

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The SIMS4
WILLOW CREEK
HOSPITAL

The case and project

Problem: Improvements of logistics and collaborative procedures at Sunnaas is dificult and time consuming, as it requires hefty amounts of data analysis and experimentation with new ways or organizing work.

Purpose of project: To support Sunnaas Sykehus in developing a novel approach to improving logistics through data visualizations (e.g. through a game like The Sims).

Partner: The project will be supported by the innovation department at SunnaasSykehus.

Suggested methods: User-driven needs analysis, design, and testing of a prototype of the solution.

Who is this project for: Students with a strong interest for the healthcare domain and pre-existing skills within data visualization.

SUNNAAS SYKEHUS

Design of patient-centered eHealth and self-care technologies

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monsted@ifi.uio.no

Project

Topic: The purpose of patient-centered eHealth is to offer patients with chronic disease support in interacting with health professionals and/or managing their condition.
However, many eHealth interventions fail because of a lack of understanding of (a)the underlying clinical principles, (b) technological opportunities and constraints, and (c) the patient's lived experience.

Purpose of project: To conduct *either..*

•User-driven design of patient-centered eHealth/self-care system, *or*

•A critical investigation of an existing system through a case study.

Bring your own case: This type of project can be conducted through a case of your own choosing – e.g. a case from your own workplace..

Examples of ongoing projects

Digital home follow-ups in primary care: Participatory Design of a digital systems for remote follow-ups of patients going through behavior change in general practice. Conducted in collaboration with private company.

Patient information needs: Investigation of information for women receiving inconclusive test results for cervical cancer to inform to design of an information platform. Conducted in collaboration with the SINTEF project VisMeg.

Digital mental health in Mozambique: Needs analysis for a system aimed at supporting monitoring mental health conditions in Mozambique.

Do you want to help improve education data use with innovative digital solutions and facilitate better and equitable utilization of education sector resources?

Education management information systems in the Gambia

Supervisor
Terje Aksel Sanner

Study points: 60

Education management information systems in the Gambia

Development Apps, focus on aspects of design, or document and reflect on the production and use of education data.

Possible themes for master topics include:

- Follow the pilot implementation of a software module for enrolment and management of learners and teachers in two schools in the Gambia
- Study the use of DHIS2 to record teacher attendance and support the national teacher posting process
- Pilot VPN connections as a way for school managers to access education management information systems
- Impact study of data use by planners at the district/regional offices in the Gambia
- Investigate the recording and use of daily learner attendance data. Is it possible to develop an "early warning" system that predicts learner drop out and informs action?
- Design of school inspector workflow tool/worklist
- Digitalization of teacher/classroom observation tool (for pedagogical training)

Up to four master students on topics listed above.
Travel to the Gambia to do fieldwork.
Work on projects in pairs if this is desirable.

Supervisor
Terje Aksel Sanner

Study points: 60

Bring your own Thesis Topic!

For students in Digitalization in the Health Sector we will organize a "bring your own topic" ***workshop***

- You have opportunity, through your workplace, or other contacts, to carry out a research project.
- You have a real-world problem, but need help to translated it into a research project.

Coordinator
Terje Aksel Sanner

Supervisors
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Alexander Kempton
Silvia Masiero
Sune Dueholm Müller
Petter Nielsen
Johanne Thunes

Study points: 60