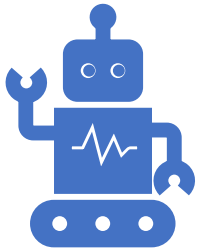
UiO : University of Oslo

institutt for informatikk



# IN5490/IN9490: Advanced Topics in Artificial Intelligence for Intelligent Systems

Course Introduction 2023

Kai Olav Ellefsen and Jim Tørresen

# What will you learn

- Gain insights into novel methods in artificial intelligence (AI) and machine learning (ML)
- Search literature and assess scientific papers
- Apply methods and conduct experiments
- Present scientific work
- Writing a scientific paper

- Understand the scientific workflow

# The approach of the course

- Work in groups of 3
- Disseminate your project as a **paper** and **presentation**
- Get a supervisor from a specialized topic
- 3 weeks of presentations/lectures + a few extra workshops on Fridays

# Who are you?

- Experience with AI/ML?
  - Courses?
  - Projects?

- Experience with reading/writing papers?

# Project Supervisors

- Ivar-Kristian Waarum : ivar-kristian.waarum@ngi.no
- Shin Watanabe : shinwa@ifi.uio.no
- Kyrre Glette : kyrrehg@ifi.uio.no
- Mats Høvin : matsh@ifi.uio.no
- Adel Baselizadeh : adelb@ifi.uio.no
- Katrine Linnea Nergård : katrner@ifi.uio.no
- Zia Uddin : zia.uddin@sintef.no
- Diana Saplacan : dianasa@ifi.uio.no
- Emma Stensby Norstein: emmaste@ifi.uio.no
- Marieke van Otterdijk : marivano@ifi.uio.no








- Jim Tørresen : jimtoer@ifi.uio.no
- Henrik Herrebrøden: henrik.herrebroden@kristiania.no
- Hugh Alexander von Arnim: hughav@imv.uio.no
- Kai Olav Ellefsen: kaiolae@ifi.uio.no
- Frank Veenstra : frankvee@ifi.uio.no
- Tom Frode Hansen: tom.frode.hansen@ngi.no





External lecturers this week:

- Bruno Castro da Silva
- Renan Maffei


# Project Topics

- Reinforcement learning
- Evolutionary computation and evolutionary robotics
- Human-robot interaction
- AI for understanding sound and motion
- Classification and Prediction

… and more …

# Selecting your project

- Each group works with a different project
- Since the time of our supervisors is limited, not everyone can have the project they most want
- But we want as many as possible to get a project you're motivated for. Therefore, we want to know your project preferences.
- But remember: **Your learning outcomes can be excellent, independent of the exact project you work on.**

# Selecting your project

- Wednesday afternoon: We share with you a link to an online form where you can submit your project preferences – as a group or individually
- **Thursday evening: Deadline for filling out the project preference form**
- Friday: We announce the project distribution

# Lecture weeks

Lecture times:

https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/timeplan/index.html

web page:

https://www.uio.no/studier/emner/matnat/ifi/IN5490/

# Course requirements

- Grading: Pass/not-pass
- To pass:
  1. Write and submit a project plan (deadline: Wednesday September 6)
  2. Present a published scientific paper and present your project (Lecture week 2)
  3. Write a research paper of your project (8 pages) (Deadline on last lecture day)

# Course requirements

- To pass:
  4. Peer review a draft of the paper of your classmates (deadline 1-2 weeks before course end)
  5. Give a final presentation of your project (final lecture week)
  - **Attend 80% of the lectures and presentations**

# Workflow

- Submit project preferences (Wednesday/Thursday)
- Pick 1 paper related to your project (next week)
  - You can pick your own papers as well, if you do, make sure to check with your advisor first!
- (1) Plan your project – and submit your project plan (in 1.5 weeks)
- (2) Present a published paper+ your project (in lecture week 2)
- Work on experiments
- (3) Write a paper
- (4) Present your project
- (5) Review a paper of others

# (1) Make a project plan

- A 2-4 page document intended to help you start coordinating with your group members early
- Deadline: September 6
- Content: https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/resources/first-deliverable.pdf

# (2) Paper presentation and project presentation (20 minutes total)

- When: Second lecture week (Sept 25-29)
- Each student prepares a paper review presentation (max 5 minutes per paper) with:
  - **Main motivation**: why is the work important?
  - **The methods**: what is the significance of the methods?
  - **Results**: what did the experiments show?
  - **Discussion**: what were the advances, limitations and prospects of the work presented in the paper?
- Present the group project after the papers (just 5 minutes per group):
  - Introduce the project and its challenges
  - Describe your approach and methods

# (3) Write up a scientific paper

1. Write a draft and hand it in
   - *Deadline: November 3rd*
   - Reviews and advisor feedback should allow you to refine the paper before the final hand-in
2. Write up the final version of the paper
   - *Deadline: Final course day (November 17th)*
   - 8 pages **(12 pages for PhD students)**
   - Template: https://no.overleaf.com/latex/templates/ieee-conference-templateexample/nsncsyjfmpxy
   - Include an ethics statement to the paper(300-500 words) https://neurips.cc/public/EthicsGuidelines

# (4) Review each other's papers

- *Deadline: November 10*
- You will anonymously get a paper assigned and will write an anonymous review (details will be given later)
- The reviews will be discussed afterwards and can be used to adjust the final version of the paper
  - Keep it secret. keep it safe.
  - Submitted reviews will be shown to the respective groups (anonymously)!
- See how others write a paper and see what you can learn from it (style, structure)

# (5) Present your project

- *When: Final lecture week (Nov 13-17)*
- 20-minute presentation of your work (every group member should speak)
- Introduce the project and its challenges
- Describe your methods
- Describe the findings
- Highlight why the experiment is relevant

# This week

- Lectures
- You will submit project preferences, and we will make assignments by Friday
  - Groups of 3

# Project Implementation

- Suggested programming language: Python
- Preferred tools: Keras/Tensorflow/Pytorch, Jupyter Notebooks, OpenAI gym, Unity ML agents
- HPC sources

  https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/resources/
- Define project preferences by Thursday!
- Project proposals: https://docs.google.com/document/d/1oExi5N-Ld_V4WHgc-2WYHxaYztuK8eXHjZ63vfZvRDo/edit?usp=sharing

# Important: Get started early

- Try setting up *weekly* meetings with your advisors/co-advisors
- Make sure you complete the weekly deliverables:
  - https://docs.google.com/document/d/1OccSst4jJcHebNsGCYxCi6GF-dLNm14CkFnBRn6L2H8/edit?usp=sharing
- In case your advisor is temporarily unavailable, or if you're stuck with something, contact Kai!

# Staying up to date

- Check the course website and your e-mail
- The weekly deliverable google docs document contains all important deadline information:
  - https://docs.google.com/document/d/1OccSst4jJcHebNsGCYxCi6GF-dLNm14CkFnBRn6L2H8/edit?usp=sharing

# Questions/troubleshooting

- Email Kai or Shin at : kaiolae@uio.no shinwa@uio.no

# Important documents

- Weekly deliverables: https://docs.google.com/document/d/1OccSst4jJcHebNsGCYxCi6GF-dLNm14CkFnBRn6L2H8/edit?usp=sharing
- Project proposals: https://docs.google.com/document/d/1oExi5N-Ld_V4WHgc-2WYHxaYztuK8eXHjZ63vfZvRDo/edit?usp=sharing
- Group project preferences: To appear on Wednesday
- Project plan (first deliverable) description: https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/resources/first-deliverable.pdf
- Lecture times: https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/timeplan/index.html
- Web Page: https://www.uio.no/studier/emner/matnat/ifi/IN5490/h23/index.html
- Paper template: https://no.overleaf.com/latex/templates/ieee-conference-templateexample/nsncsyjfmpxy