

## Using Artificial Intelligence to Predict Student Performance using Eye-tracking Data and Facial Expressions

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**Place:** Trondheim

### Introduction

The focus of the thesis is to develop artificial intelligence pipelines to enhance the prediction of student performance in individual learning tasks, such as video-based learning, programming, assessment. The challenge is to create pipelines that are better suited for a small number of students but with high frequency data (eye-tracking and facial expressions).

### Thesis Description

In a first step, the student(s) will design and implement the pipeline with existing datasets. Afterwards, they will conduct a small user study in order to test the effectiveness of the pipeline in two different scenarios (**the number of scenarios can be decided later**). Finally, the candidate(s) will analyse the collected data and write up his/her thesis.



### Requirements

The ideal candidate will have a background in basic machine learning and artificial intelligence. Solid programming skills and an interest in hands-on development and experimentation is also a requirement.

Programming skills: Python.

### Expected Project Work Packages

1. **WP:** Small literature review on use of machine learning with eye-tracking and facial features in educational settings.
2. **WP:** Iteratively develop and test the prediction pipeline.
3. **WP:** Conduct a user study to test the effectiveness of the system with unseen data.
4. **WP:** Write-up the thesis.

### Thesis grading scheme

Grade	Description of the evaluation criteria
<b>A</b>	The candidate demonstrates excellent judgement and a high degree of independent thinking. <b>Significantly exceeded expectations</b> with original contribution.
<b>B</b>	The candidate demonstrates sound judgement and a very good degree of independent thinking. A very good performance, <b>the candidate has exceeded expectations.</b>

<b>C</b>	A good performance in most areas. The candidate demonstrates a reasonable degree of judgement and independent thinking in the most important areas, <b>the expectations are met but not surpassed.</b>
<b>D</b>	A satisfactory performance, but with significant shortcomings. The candidate demonstrates a limited degree of judgement and independent thinking.
<b>E</b>	A performance that meets the minimum criteria, but no more. The candidate demonstrates a very limited degree of judgement and independent thinking.
<b>F</b>	A performance that does not meet the minimum academic criteria. The candidate demonstrates an absence of both judgement and independent thinking.