

*By submitting this portfolio the authors certify that this is their original work, and they have cited all the referenced materials properly.*

Preliminary Machine Learning report

[name, student number, email address]

[name, student number, email address]

[name, student number, email address]

Minor: [Name of the minor]

Group: [Group nr]

Date: [kies een datum]

**When submitting your report, follow these steps:**

1. **Rename this file** 
   * **Replace {YOUR GROUP\_NUMBER} with your group number**
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Contents

[1 Introduction 3](#_Toc98927319)

[2 Problem statement 4](#_Toc98927320)

[3 Data acquisition and exploration 5](#_Toc98927321)

[4 References 6](#_Toc98927322)

# Introduction

|  |  |
| --- | --- |
| Assignment | Introduce your ML report  Explain how it fits in the minor program  Describe the importance of ML in your areas of interest  Show how ML relates to your main project in the minor  List your learning objectives |
| Acceptance criteria | ML relation to the minor is discussed.  ML portfolio relation to main project in the minor is discussed. |
| Size | Max 1 A4 |

# Problem statement

|  |  |
| --- | --- |
| Assignment | 1. Choose one of these options:    1. Hand gesture classification (Recognize at least 3 gestures)    2. Object classification (Recognize at least 3 objects)    3. ML objective in your EVML project (Replace the classifier in step 5 of the conventional vision train)   Your project must cover these subjects: Data acquisition, Data exploration, Data preparation, ML model selection, Model training, Model fine-tuning, Model deployment, Model testing   1. List and prioritize requirements: 2. Functional requirements: List what your system must do Include measurable criteria, such as:  - gestures or objects to recognize - performance levels to achieve - frame rate needed 3. Non-functional requirements:  List technical constraints, such as:  - camera angles - operating distances - hardware limitations - environmental conditions |
| Acceptance criteria | Problem definition is specific and measurable [1].  Functional and technical requirements are listed and prioritized. |
| Size | Max 1 A4 |

# Data acquisition and exploration

|  |  |
| --- | --- |
| Assignment | 1. Make an image set Set up a controlled test area Take photos Label each photo Make visual representations of your data Assess data quality: - Does the data represent all cases? - Is there enough data? - Are all classes equally represented? - Is the data free from bias? 2. Compute, visualize, and check feature data Choose at least 3 image features Make an algorithm to calculate features   Assess feature data quality: - Are features useful (informative)? - Are features able to tell classes apart (discriminating)? - Are features easy to understand (explainable)?  - Are there outliers (unusual data points) to remove? Analyze feature relationships:  - Find correlations between features - Check if features provide unique information (independent) - Consider creating combined or transformed features if useful Explain your choices   1. Design and implement a preprocessing pipeline: calculate features create algorithm to clean data scale data   Explain each step in your pipeline Show how the pipeline makes data patterns clearer |
| Acceptance criteria | Data collected, features engineered and argued.  Feature data is visualized and explored, quality is checked.  Preprocessing pipeline discussed and implemented. |
| Size | Max 5 A4 |

# References

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| --- | --- |
| Assignment | Give references to the sources that you have used. |

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| [1] | "SMART criteria," 14 05 2020. [Online]. Available: https://en.wikipedia.org/wiki/SMART\_criteria. |
| [2] | A. Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, Sebastopol, Canada.: O’Reilly Media, 2019. |