

AN2DL - First Homework Report

DeepL

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Note: The following sections represent a suggested structure. Feel free to adapt them to better suit your specific project needs.

1 Introduction

In this section, you should present your project's context and objectives. You might want to:

- Define the problem (*you may use italics to highlight definitions*)
- State your goals (**emphasise key points with bold**)
- Outline your approach

For instance, you might write: “This project focuses on *image classification* using **deep learning** techniques.”

2 Problem Analysis

Here you can discuss your initial analysis of the problem. Consider including:

1. Dataset characteristics
2. Main challenges
3. Initial assumptions

If you need to reference papers, use the citation command: Recent work [1] suggests...”

3 Method

This section should detail your approach. You can use equations to explain your methodology. For example, a simple model representation:

$$f(x) = \text{softmax}(Wx + b) \quad (1)$$

Or a more complex loss function:

$$\mathcal{L} = -\frac{1}{N} \sum_{i=1}^N y_i \log(\hat{y}_i) \quad (2)$$

Reference these equations in your text, like: “As shown in equation 1...”

4 Experiments

For your experiments, you might want to present your results in tables. Here's an example of a wide table comparing different models:

For more specific measurements, you might use a narrower table:

Table 1: An example of wide table. Best results are highlighted in **bold**.

Model	Accuracy	Precision	Recall	ROC AUC
VGG18	72.20 \pm 3.06	94.95 \pm 0.52	86.95 \pm 0.55	80.16 \pm 0.81
Custom Model	27.71 \pm 3.19	75.70 \pm 1.07	55.75 \pm 2.16	36.60 \pm 1.26
ResNet18	89.24 \pm 2.38	95.54 \pm 0.49	93.43 \pm 1.30	91.68 \pm 0.71

Table 2: An example of table. Best results may be highlighted in **bold**.

Time [μ s]	Distance [mm]
22 \pm 4	8 \pm 1
17 \pm 3	7 \pm 1
15 \pm 3	6 \pm 1
13 \pm 2	5 \pm 1
10 \pm 2	4 \pm 1
8 \pm 2	3 \pm 1
5 \pm 1	2 \pm 1
37 \pm 1	1 \pm 1

You can also include figures to visualise your results:



Figure 1: Example figure showing [describe what the figure shows]

Reference figures using like: “As shown in Figure 1...”

5 Results

Present your main findings here. You might want to:

- Compare your results with baselines
- Highlight key achievements using **bold text**
- Explain any unexpected outcomes

6 Discussion

In this section, analyse your results critically. Consider:

- Strengths and weaknesses
- Limitations and assumptions

7 Conclusions

Summarise your work and discuss potential future directions. This is where you can:

- Restate main contributions
- Suggest improvements
- Propose future work

8 Logbooks

Here we can write our personal logbooks.

8.1 Matteo

- Google Drive folder
- L^AT_EX repository
- A bit of data inspection and noised aummentation

8.2 Lorenzo

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8.3 Michele

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8.4 Elena

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References

- [1] Y. LeCun, Y. Bengio, and G. Hinton. Deep learning. *nature*, 521(7553):436–444, 2015.