

## GROUP2505 – Log-likelihood analysis for Restricted Boltzmann Machines

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(Dated: March 23, 2025)

[illegible]

## RULES

- Compile the latex file (found in the google folder from moodle) with the format of this template, without changing the parameters (page size etc.).
- The text, figures, and references should be of about four pages.
- There is a deadline for submission is written in moodle.
- Write a statement in which the contribution of each member of the group is specified.

- Do not change the time of verbs; it is simpler to speak in simple present, however also writing always in past tense is fine.
- In figures, use fonts that match the size of the main text fonts (tiny fonts should be avoided). Use lines with different dashing, color, and symbol as appropriate for better distinguishing the curves. Use log scale when it is better for highlighting smaller scales or flattening larger scales.
- Remember the grid explained in the intro video of the course, which will be used for evaluations. It contains suggestions for improving the text.

**Latex** – A modern online tool to handle and share latex files is *Overleaf*. The other option is a standard latex installation on the computer. Locally, this text is compiled with the command `pdflatex` and is based on `revtex`. Packages (of which, maybe not all are needed) in Arch Linux may be installed via

```
sudo pacman -S texlive-core
texlive-bibtexextra texlive-fontsextra
texlive-formatsextra texlive-latexextra
texlive-pictures texlive-pstricks
texlive-publishers texlive-science
```

In Ubuntu there is a similar installation with `sudo apt install`, maybe `sudo apt install texlive-full` if you want to lose less time to pick the right packages. Similar tools should be available in Windows and via e.g. macports on Mac OS.

## INTRODUCTION

The main purpose of this assignment is to simulate the writing of a short paper, to train the writing skills and the capability to explain a subject with effective simple sentences and a logic chain.

The topic of your assignment is specified at the lesson. It requires you to describe your findings in one of the exercises.

In this introduction, you should describe the main topic in general terms, introducing what you want to discover, why, and which methods you use do perform this study. There could also be citations like this [1] to papers, websites, etc. forming the list of references that other people could be interested in consulting for a better understanding your points.

## Tips

- In English use sentences shorter than what you might normally be using in Italian, German, etc...
- Possibly, Explain concepts at a level which is accessible to everybody.
- Do not use colloquial forms in scientific writing, thus avoid it's, aren't, don't, etc.

## METHODS

Here describe which tools you decided to use for solving the problem, with equations

$$A = B \quad (1)$$

or systems of equations

$$\begin{aligned}\dot{v}(t) &= -U'(x) \\ \dot{x}(t) &= v(t)\end{aligned}\tag{2}$$

and eventually with pieces of code (Jupyter allows saving

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quantity	symbol	dimensionless
time	$t$	$t'$
momentum	$p$	$v$

## RESULTS

Cite Figure 1(a), etc. to add information. Later also cite Figure 2 and Figure 3. Of course the number and size of figures may vary from project to project.

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- [1] B. Franklin, J. Here There **10**, 20–40 (1800).
- [2] A. Einstein, Int. J. There Here **20**, 125–133 (1910).

# Assignment score grid

<b>Structure:</b> the exposition follow a logic order	8
<b>Clarity:</b> the text is brief enough, avoids complicated sentences and specifies all concepts and links	8
<b>Depth:</b> the text is not a shallow repetition of notions, there emerges a good understanding	8
<b>Rigor:</b> the analysis of the results is precise, quantitatively, and convincing	8
<b>Innovation:</b> new methods/ideas are introduced; conclusions beyond what introduced in the class	4