

The First



Deadline: 12 February 2022 (11:59pm)

Task is to write a critical review

- ❑ Reading research papers is crucial for ML & Deep Learning fields.
- ❑ In the next slides, you can see 2 famous papers, and you need to choose **one** of them. Please read this paper carefully, then write a critical review.
- ❑ The critical review needs to be **2 pages (maximum)**.
- ❑ Your critical review should have the following sections:
 - ❑ Introduction: usually one paragraph, present the aim of the paper, and conclude the introduction with a brief statement of your evaluation (positive or negative).
 - ❑ Summary: Present a summary of the key points along with a limited number of examples.
 - ❑ Critique: A balanced discussion and evaluation of the **strengths**, **weakness** and **notable features** of the paper. Please share your own opinions. **[very important]**
 - ❑ Conclusion: Restate your overall opinion, provide recommendations.
 - ❑ References: If you have used other sources in you review you should also include a list of references at the end of the review.

<https://www.student.unsw.edu.au/structure-critical-review>

Option 1

The first paper that describes an effective way of training a deep neural network

A fast learning algorithm for deep belief nets *

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Abstract

We show how to use “complementary priors” to eliminate the explaining away effects that make inference difficult in densely-connected belief nets that have many hidden layers. Using complementary priors, we derive a fast, greedy algorithm that can learn deep, directed belief networks one layer at a time, provided the top two layers

remaining hidden layers form a directed acyclic graph that converts the representations in the associative memory into observable variables such as the pixels of an image. This hybrid model has some attractive features:

1. There is a fast, greedy learning algorithm that can find a fairly good set of parameters quickly, even in deep networks with millions of parameters and many hidden layers.

<https://www.cs.toronto.edu/~hinton/absps/fastnc.pdf>

Option 2

A famous deep learning overview paper
(*A very nice summary*)

Deep learning

Yann LeCun, Yoshua Bengio & Geoffrey Hinton



← → ↺ [nature.com/articles/nature14539](https://www.nature.com/articles/nature14539)

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Published: 27 May 2015

Deep learning

[Yann LeCun](#) ✉, [Yoshua Bengio](#) & [Geoffrey Hinton](#)

[Nature](#) **521**, 436–444 (2015) | [Cite this article](#)

681k Accesses | **28734** Citations | **1114** Altmetric | [Metrics](#)

Abstract

Deep learning allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction. These methods have dramatically improved the state-of-the-art in speech recognition, visual object recognition, object detection and many other domains such as drug discovery and genomics. Deep learning discovers intricate structure in large data sets by using the backpropagation

<https://www.nature.com/articles/nature14539.pdf>

Conclusion

- Please note that these are the very important deep learning papers published in the past years.
- These papers can be seen as the building blocks of the deep learning field.
- My suggestion for those who are interested, is to read both of these papers and understand the basic idea behind them. However, please only submit review for **one of them**.
- In the following weeks, you'll receive another list of papers for CNN and RNN/LSTM.
- Please submit a PDF document with your name and student ID.

The instructor will use plagiarism software and all submissions must be submitted individually. Plagiarism will not be tolerated.