



الجامعة الوطنية للعلوم التطبيقية بتبسة  
H+oLCoO+l+CoOoLxi+oOl  
Nationale des Sciences Appliquées de Tébessa

# INTRODUCTION TO DEEP LEARNING: LECTURE RECAP

A Summary of Key Points from Lecture 1



Prepared By  
Loubaba Malki L'Hlaibi

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Supervised by  
Prof. Belcaid Anass

CS 212

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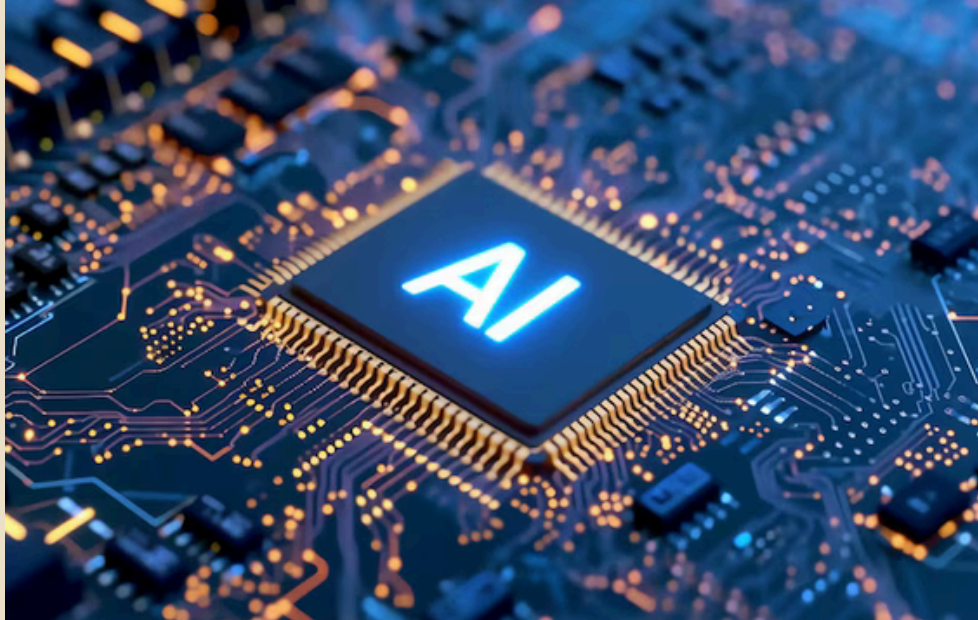
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# COURSE OVERVIEW

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## Aims of This Course:

- 01** | Introducing modern deep learning models.
- 02** | Learning about the fundamental concepts behind modern learning models.
- 03** | Mastering building all the basic architectures and models from scratch.

# COURSE OVERVIEW

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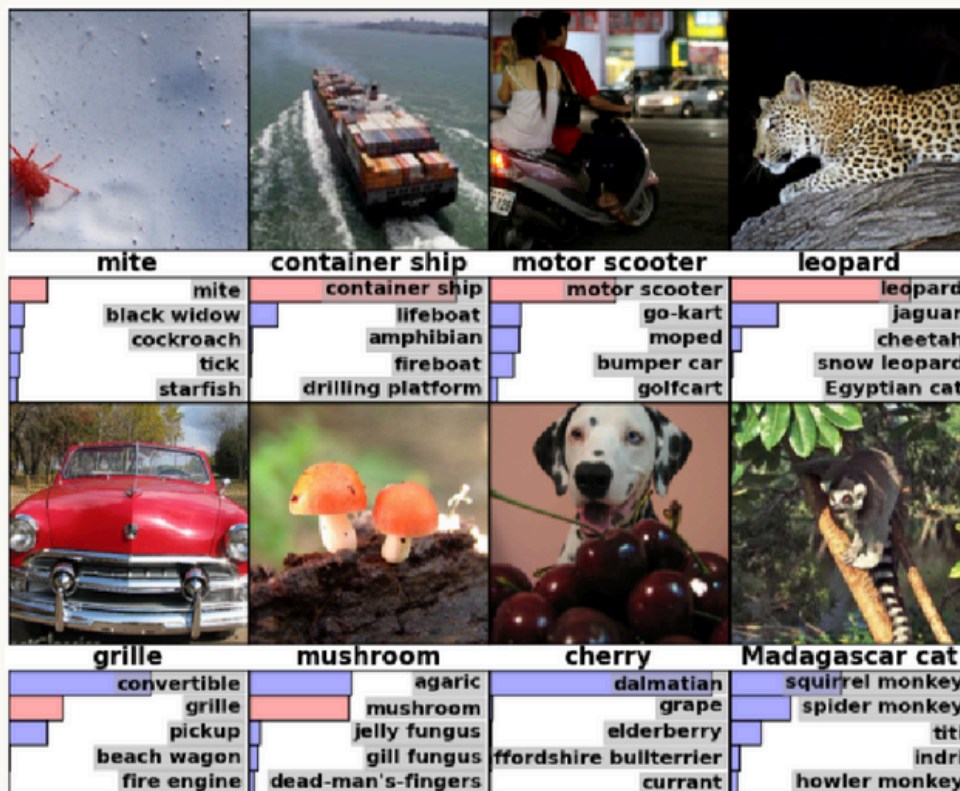
## Course Chapters:

- Machine Learning Refresher.
- Back propagation and automatic differentiation.
- Neural Networks: Architecture
- Neural Networks: Data and the loss
- Neural Networks: Data and the loss
- Neural Networks: Learning and Evaluation.
- Convolutional neural Networks
- Classical Models zoology
- Recurrent Neural Networks.
- Edge detection
- Transformers

# APPLICATIONS OF DEEP LEARNING

## 1. IMAGE CLASSIFICATION:

AlexNet is a deep convolutional neural network to classify the 1.2 million high-resolution images into the 1000 different classes.



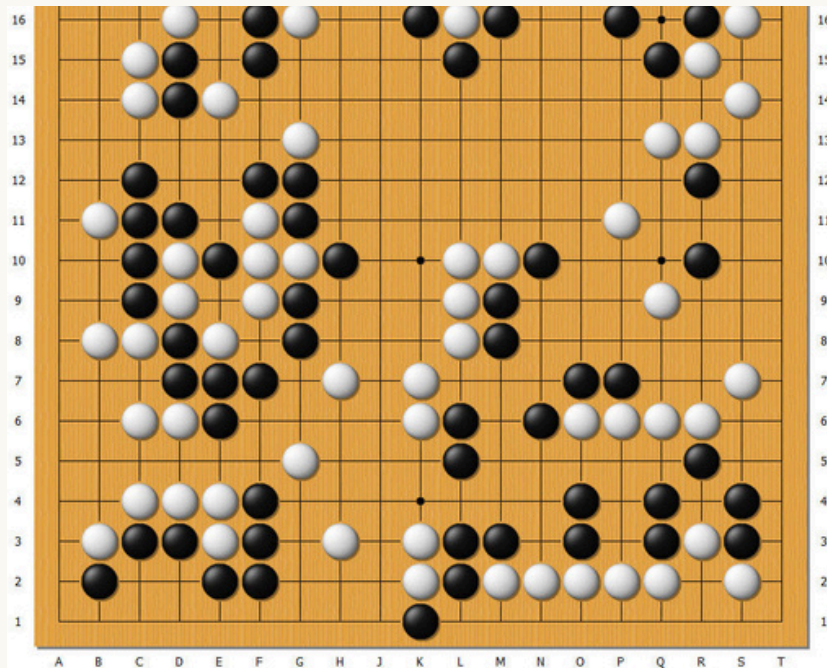
**Paper :** [AlexNet 2012 Paper by Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton](#)



# APPLICATIONS OF DEEP LEARNING

## 2. ALPHAGO

AlphaGo is an artificial intelligence program developed by DeepMind, a subsidiary of Google, designed to play the board game Go.

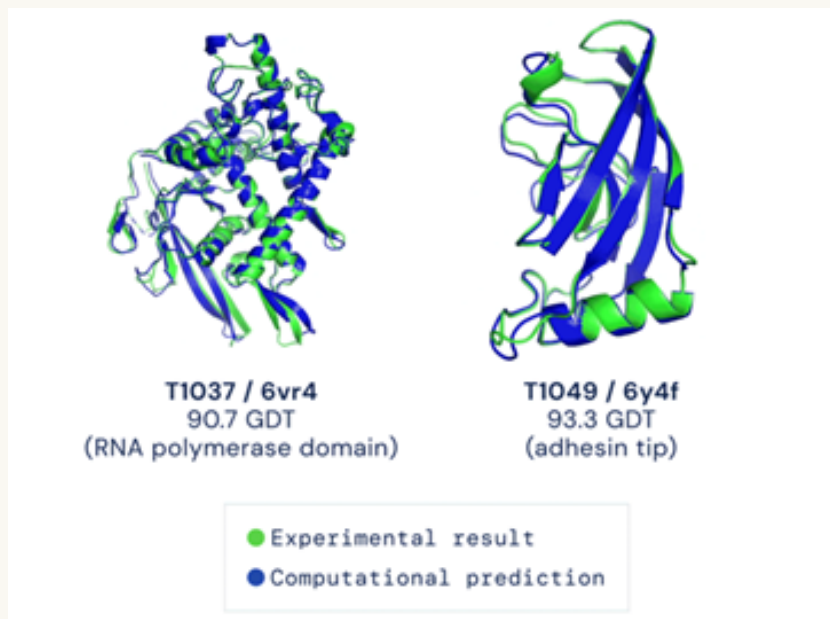


**Paper :** [AlphaGo 2016 Paper by David Silver, Aja Huang, Chris J. Maddison, et al.](#)

# APPLICATIONS OF DEEP LEARNING

## 3. ALPHAFOLD 2

AlphaFold 2 is an artificial intelligence system developed by DeepMind, designed to predict the 3D structures of proteins with remarkable accuracy.

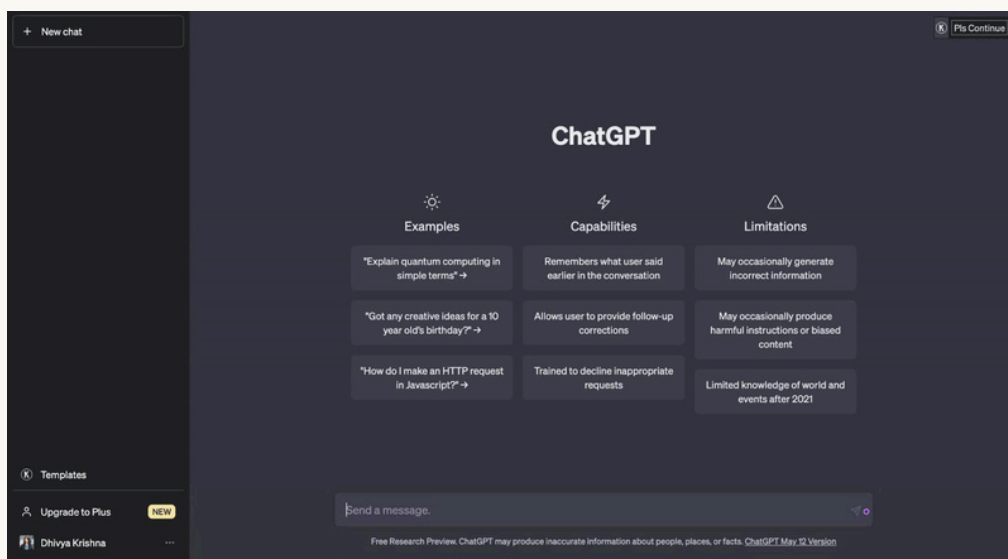


**Paper :** [AlphaFold 2 Paper \(2021\)](#). by John Jumper, Richard Evans, Alexander Pritzel, et al.

# APPLICATIONS OF DEEP LEARNING

## 4. CHATGPT

ChatGPT is an advanced AI language model developed by OpenAI, based on the GPT (Generative Pretrained Transformer) architecture. It is designed to understand and generate human-like text based on the input it receives.



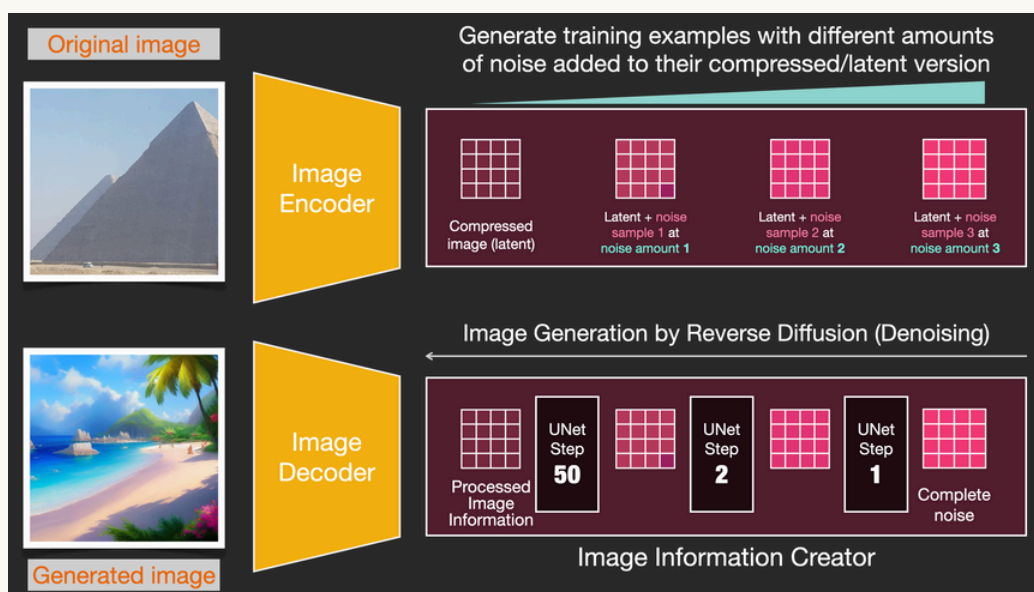
**Paper :** [ChatGPT 2022 Paper by Tom B. Brown, Benjamin Mann, Nick Ryder, et al.](#) [David Silver, Aja Huang, Chris J. Maddison, et al.](#)



# APPLICATIONS OF DEEP LEARNING

## 5. STABLE DIFFUSION

Stable Diffusion is a deep-learning model developed for generating images from textual descriptions. It is a type of generative model that belongs to the family of diffusion models, which use a diffusion process to gradually generate an image from random noise based on the input text.



**Paper :** [Stable Diffusion Paper \(2022\) by Robin Rombach, Andreas Blattmann, Dominik Lorenz, et al.](#)

# HISTORICAL CONTEXT

2008

Deep Learning gains traction at NeurIPS

2012

The development of AlexNet

2015

The creation of Keras

2015

The release of TensorFlow

2016

Introduction of PyTorch

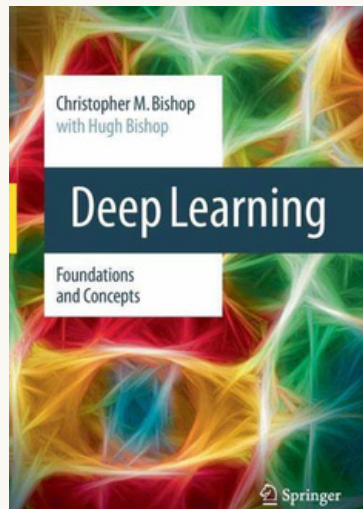
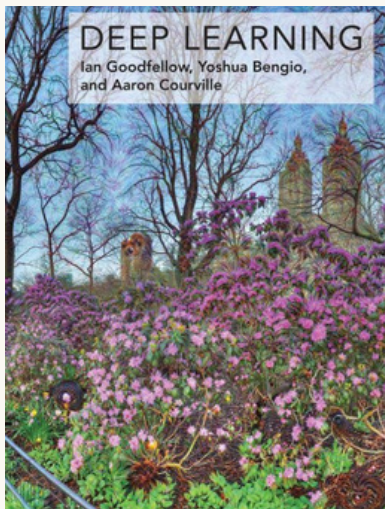
# REFERENCES AND MATERACIALS

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## Books

Deep Learning : Ian Goodfellow, Yoshua Bengio  
and Aaron Courville.

Deep Learning Foundations and Concepts by  
Chris Bishop and Hugh Bishop



# REFERENCES AND MATERACIALS

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## Websites

<https://anassbelcaid.github.io/deeplearning/>

[https://piazza.com/first\\_login?  
token=4LHFArboa57&mc\\_id=pw\\_2](https://piazza.com/first_login?token=4LHFArboa57&mc_id=pw_2)

## Email

[a.belcaid@uae.ac.ma](mailto:a.belcaid@uae.ac.ma)