



LECTURE SERIES ON MACHINE LEARNING AND NEURAL QUANTUM STATES AT THE UNIVERSITY OF DSCHANG

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MACHINE LEARNING AND AI FOR MANY-BODY PHYSICS

Lavoisier Wah

Max Planck Institute for the Science of Light, Germany

lavoisier.wahkenounouh@mpl.mpg.de



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This course will partially be an adaptation of Florian Marquardt Lecture on machine learning for physicist and of our paper Lavoisier Wah *et al.*, Phys. Rev. Research 7, 043291

Biography



Model

- **DIPES I**, Higher Teacher Training College - University of Bamenda (Cameroon).
- **BSc in Physics**, University of Dschang (Cameroon).
- **MSc in Condensed Matter Physics**, University of Dschang (Cameroon) - University de Lorraine (France).
- **Perimeter Scholar International diploma**, Perimeter Institute for Theoretical Physics (Canada).
- **MSc in Physics and Cosmology**, University of Waterloo (Canada)
- **PhD in Physics**, Max Planck Institute for the Science of Light - Friedrich-Alexander University Erlangen-Nuremberg (Germany) [ongoing]



Lecture 0

Introduction

Introduction

See file “**Lecture0**” on github.

Link: <https://github.com/Kenounouh/Machine-Learning-and-AI-for-Many-body-Physics-Lecture-Note-University-of-Dschang/tree/main>

Lecture 1

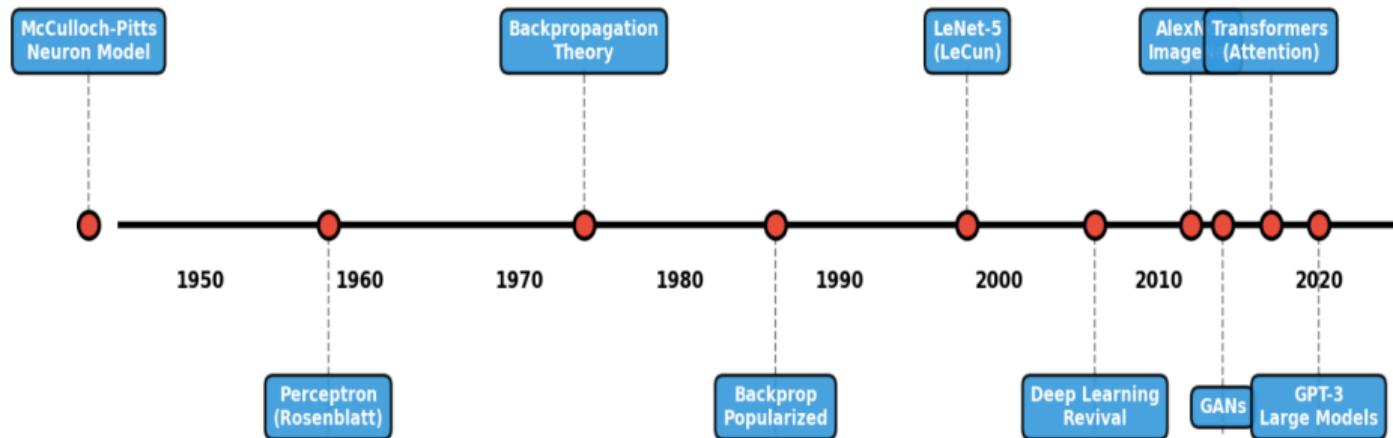
Machine Learning and Neural Networks: Fundamentals & Theory



What is Machine Learning ?

- Branch of Artificial Intelligence that enables computers to learn from data
- Systems improve performance on tasks through experience without explicit programming
- Focuses on developing algorithms that can identify patterns in data
- Applications: image recognition, natural language processing, recommendation systems, autonomous vehicles
- **Core idea:** Learn a function $f : X \rightarrow Y$ that maps inputs to outputs

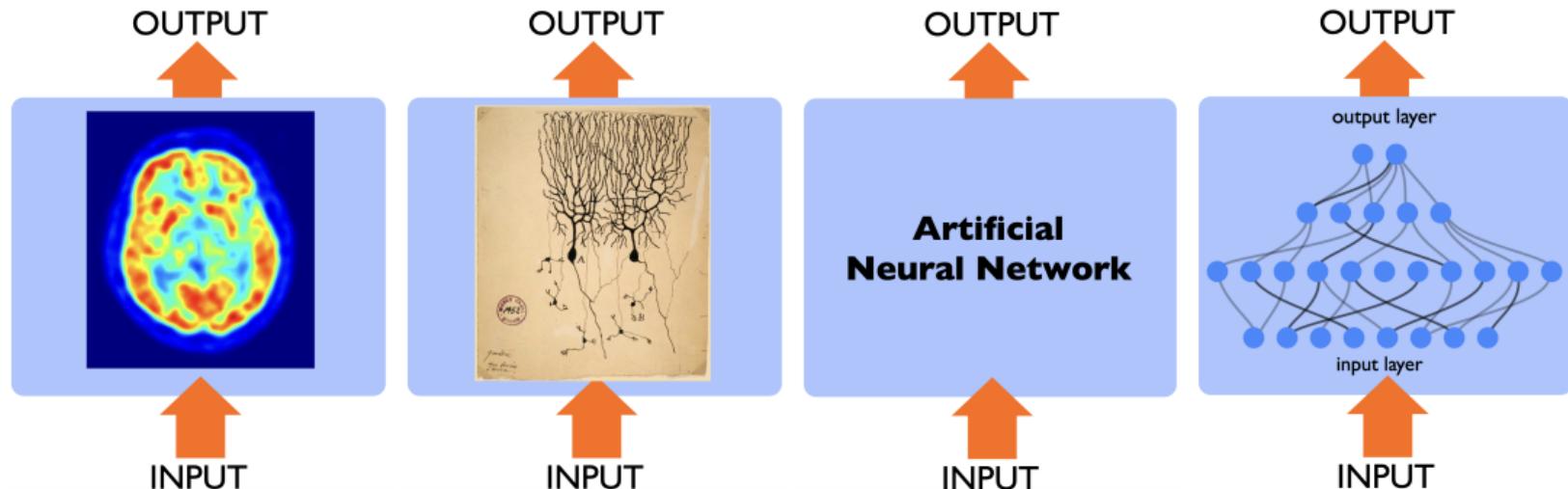
History of Artificial Neural Networks



- 1943: McCulloch-Pitts model - first mathematical model of a neuron
- 1969: "AI Winter" - limitations of perceptrons discovered
- 2006-2012: Deep Learning revolution begins
- 2012-Present: Era of deep learning with massive datasets and compute

Why Neural ?

Similar to neurons in the brain !¹



¹F.M. Notes

Ψ

THANKS



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