

L'apprentissage automatique et les outils génératifs en pratique avec ChatGPT

Vincent Jolivet



Crédit : GETTY

L'INTERVENANT



JOLIVET Vincent



Docteur en informatique
Enseignant/Chercheur laboratoire
XLIM UMR CNRS
Directeur de l'IAE Limoges

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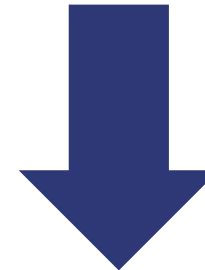
ENTRÉES



GRANDE
JOURNÉE
DE L'INNOVATION



SORTIES



L'IA : Un processus “*magique*” ?

QU'Y A-T-IL DANS LA BOÎTE MAGIQUE ?

$$V_0 \frac{dV}{dt}, a = \frac{dV}{dt} \quad U = \text{const}, u = \frac{v}{t}, a = \frac{v}{2s}, S = V_0 t + \frac{at^2}{2}, S = \frac{V^2 - V_0^2}{2a}, x = x_0 + V_0 t + \frac{at^2}{2}, V = \frac{ds}{dt}$$

$$\text{const } S = vt, x = x_0 + vt; \quad V = V_0 + at, v = \sqrt{V_0^2 - 2as};$$

$$\vec{v} = (v \cdot \vec{e}_t, \vec{e}_n), \quad \vec{a} = a_t \vec{e}_t + \frac{v^2}{R} \vec{e}_n, \quad \vec{a} = \vec{a}_t + \vec{a}_n, \quad \vec{\omega} = \frac{d\vec{\theta}}{dt}, \quad \vec{F} = m\vec{a}, \quad \vec{F} = \frac{d\vec{p}}{dt}, \quad \vec{F} = m\vec{a} + \frac{d\vec{m}}{dt} \vec{v}, \quad m = \text{const};$$

$$V_c = \sum_{i=1}^n \frac{p_i}{m_i}, \quad F = G \frac{m_1 m_2}{R^2}, \quad \vec{F}_2 = \vec{F}_{21}, \quad m a = m a_0 + F_{in}, \quad V = \frac{2\pi R}{T}, \quad \vec{F}_2 = \vec{F}_{21}, \quad m a = m a_0 + F_{in}, \quad V = \frac{2\pi R}{T};$$

$$p = mg, \quad \vec{F} = \mu N; \quad F = -kx; \quad Q = \frac{F}{S}; \quad \epsilon = \Delta \ell / \ell_0; \quad \epsilon' = \Delta d / d_0; \quad \frac{\epsilon'}{\epsilon} = \mu. \quad \sigma = E \epsilon, \quad \vec{F} = \frac{E \Delta \ell}{\ell_0};$$

$$p = m(g+a), \quad \vec{L} = I \vec{\omega}, \quad \vec{M} = \frac{d\vec{L}}{dt}; \quad \vec{M} = I \vec{\epsilon} + \vec{\omega} \frac{dI}{dt}; \quad L = \text{const}; \quad M = F \ell; \quad f = f_0 + m \omega^2; \quad W = V \frac{E \epsilon^2}{2};$$

$$p = m(g-a), \quad \vec{L} = I \vec{\omega}, \quad \vec{M} = \frac{d\vec{L}}{dt}; \quad \vec{M} = I \vec{\epsilon} + \vec{\omega} \frac{dI}{dt}; \quad L = \text{const}; \quad M = F \ell; \quad f = f_0 + m \omega^2; \quad W = V \frac{E \epsilon^2}{2};$$

$$p = m(g - v^2/r), \quad p = m v, \quad \sum F = 0; \quad A = \vec{F} \cdot \vec{S}, \quad A = (E; N = \frac{dA}{dt}; \quad E = \frac{mv^2}{2}; \quad E = \frac{mv^2}{2} + \frac{1}{2} \omega^2; \quad E = mgh; \quad E_p = \frac{kx^2}{2};$$

$$E_{x1} + E_{p1} = E_{x2} + E_{p2}; \quad pV = NkT; \quad U = \frac{1}{2} NkT; \quad v = \frac{m}{\mu}; \quad N = \frac{m}{m_0}; \quad p = \frac{1}{3} m_0 n v^2; \quad p = \sum p_i; \quad n = \frac{N}{V}; \quad p = nkT; \quad n = \text{const};$$

$$= 4\pi \left(\frac{m_0}{2\pi kT} \right)^{3/2} v^2 e^{-\frac{m_0 v^2}{2kT}}; \quad U = \frac{1}{2} pV; \quad \langle v^2 \rangle = \frac{3kT}{m_0}; \quad v = \sqrt{2kT/m_0}; \quad v = \sqrt{\frac{8kT}{\pi m_0}}; \quad f(v)$$

$$\langle r \rangle = \frac{\langle v \rangle t}{n \sqrt{2\pi} d^2}; \quad \vec{L} = \frac{1}{\sqrt{2\pi} d^2 n}; \quad \frac{p v^2}{2} + pgh + p = \text{const}; \quad h = \frac{2\sigma}{\rho g r}; \quad F_k = \frac{1}{4\pi\epsilon_0} \frac{|q_1| |q_2|}{r^2};$$

$$\Delta U = \Delta Q - A; \quad A = p \Delta V; \quad V^\gamma p = \text{const}; \quad \varphi = \frac{W}{q}, \quad \varphi = -\int \vec{E} \cdot d\vec{r}; \quad A = q \int \vec{E} \cdot d\vec{\ell}, \quad A = q(\varphi_1 - \varphi_2), \quad U = \varphi_1 - \varphi_2; \quad \vec{F} = \frac{1}{4\pi\epsilon_0} \frac{|q_1| |q_2|}{r^2};$$

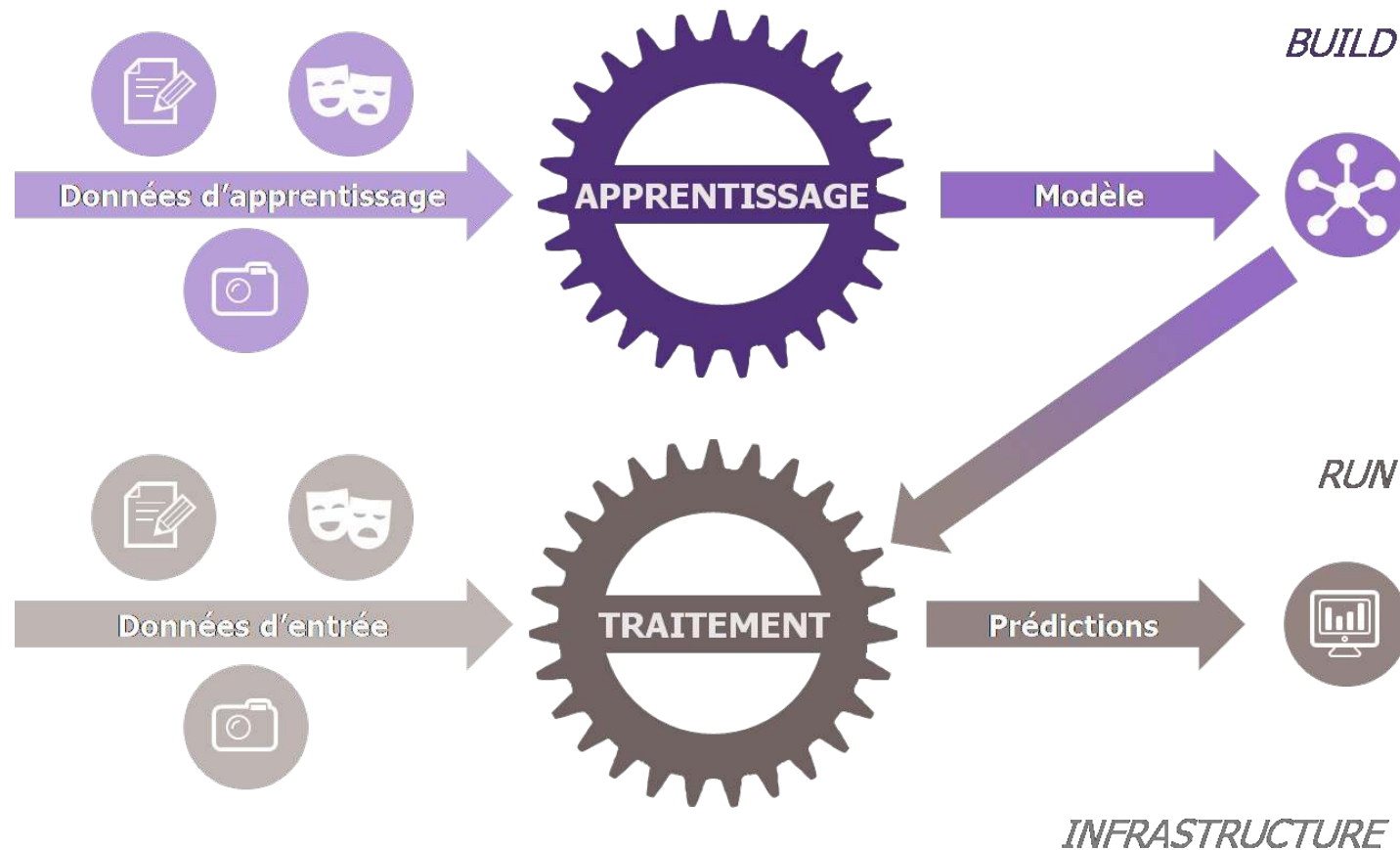
$$\vec{F} = \frac{1}{4\pi\epsilon_0} \frac{|q_1| |q_2|}{r^2}, \quad \vec{E} = \frac{1}{4\pi\epsilon_0} \frac{|q|}{r^2};$$

GRANDE

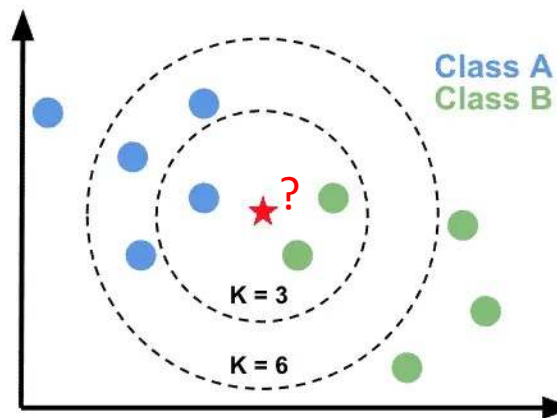
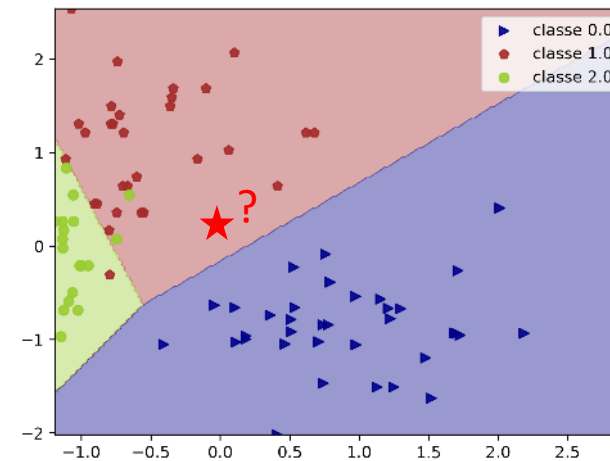
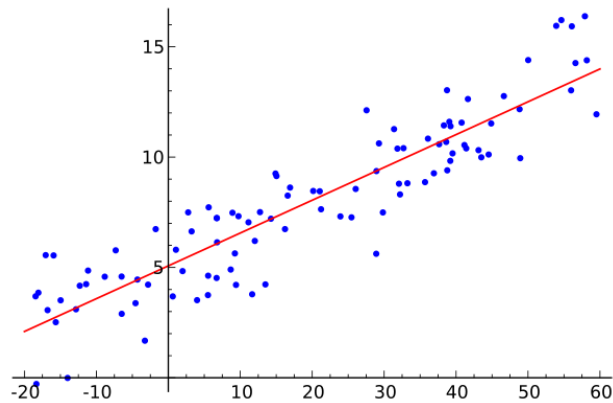
```
string4replace = string+cp...
tempValue = str(row
): value = float(value) tempValue = str(row
tempformat = 14 #Replace string by value's QA temp
str(key)) tempString = tempString.replace("czDataTyp
str(value*pow(10,14-tmpFormat))) tempString = temp
all(typeOffID == "BUFFER"): s = value dataCal =
tempString.replace("czFieldID",str(key)) tempStri
all(typeOffID == "ASCII_STRING"): s = value dataC
tempString = tempString.replace("czData",
if "value=" in line and flagCheckRicnam
myEvent = "RT_CHA
if typeOfFile == "RT":
os.path.exists(path): os.makedirs(path)
searchObj = re.search(
filename in
```

ION

L'APPRENTISSAGE AUTOMATIQUE

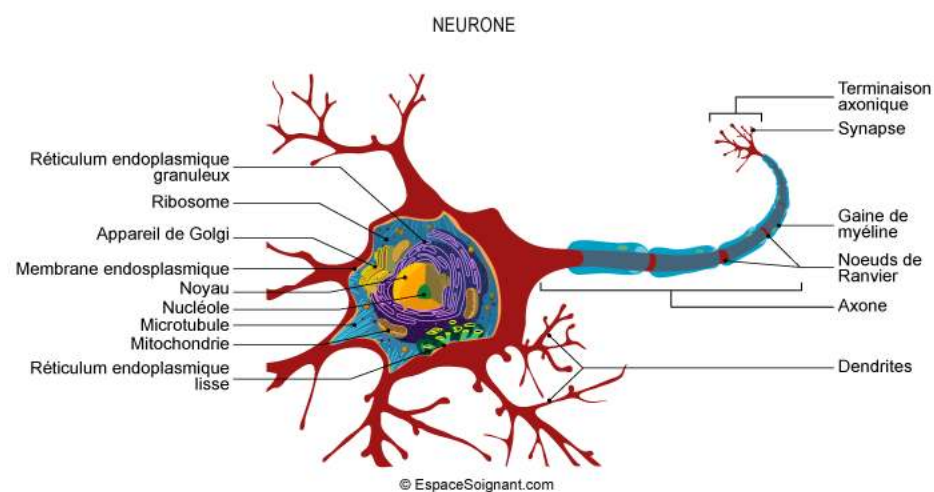


QUELQUES MÉTHODES SUPERVISÉES



Du neurone formel aux *transformers*

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1943

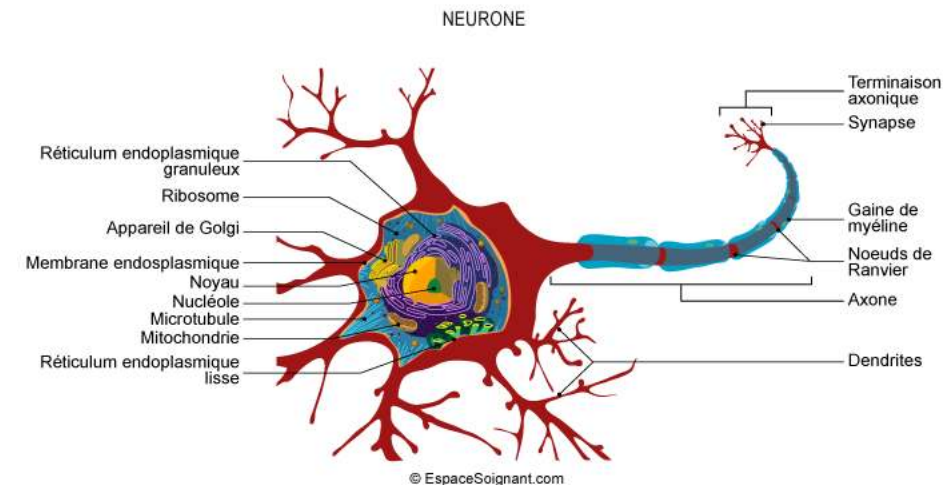
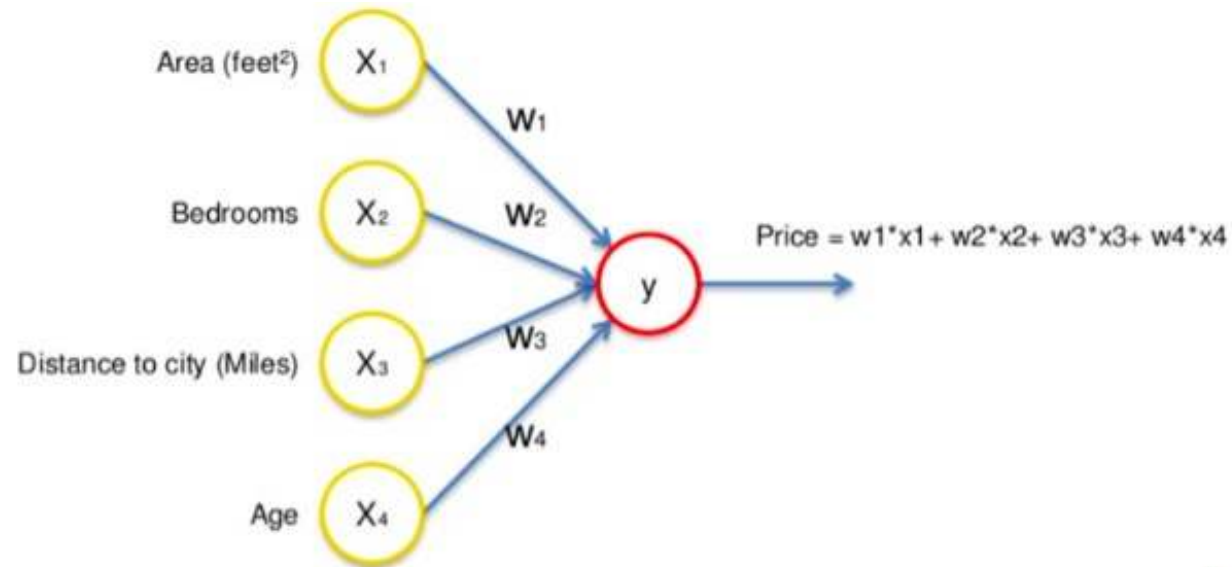


2017

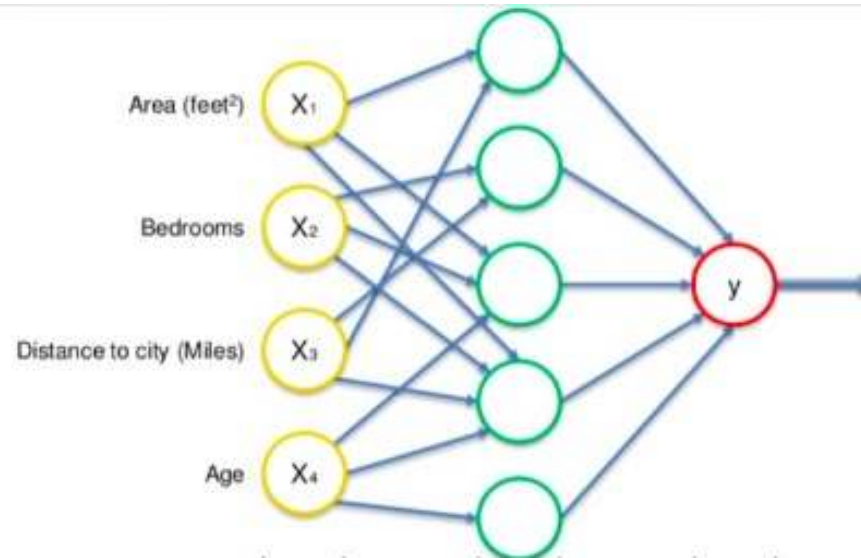
(2022 ChatGPT)

Neurone formel (McCulloch-Pitts 1943)

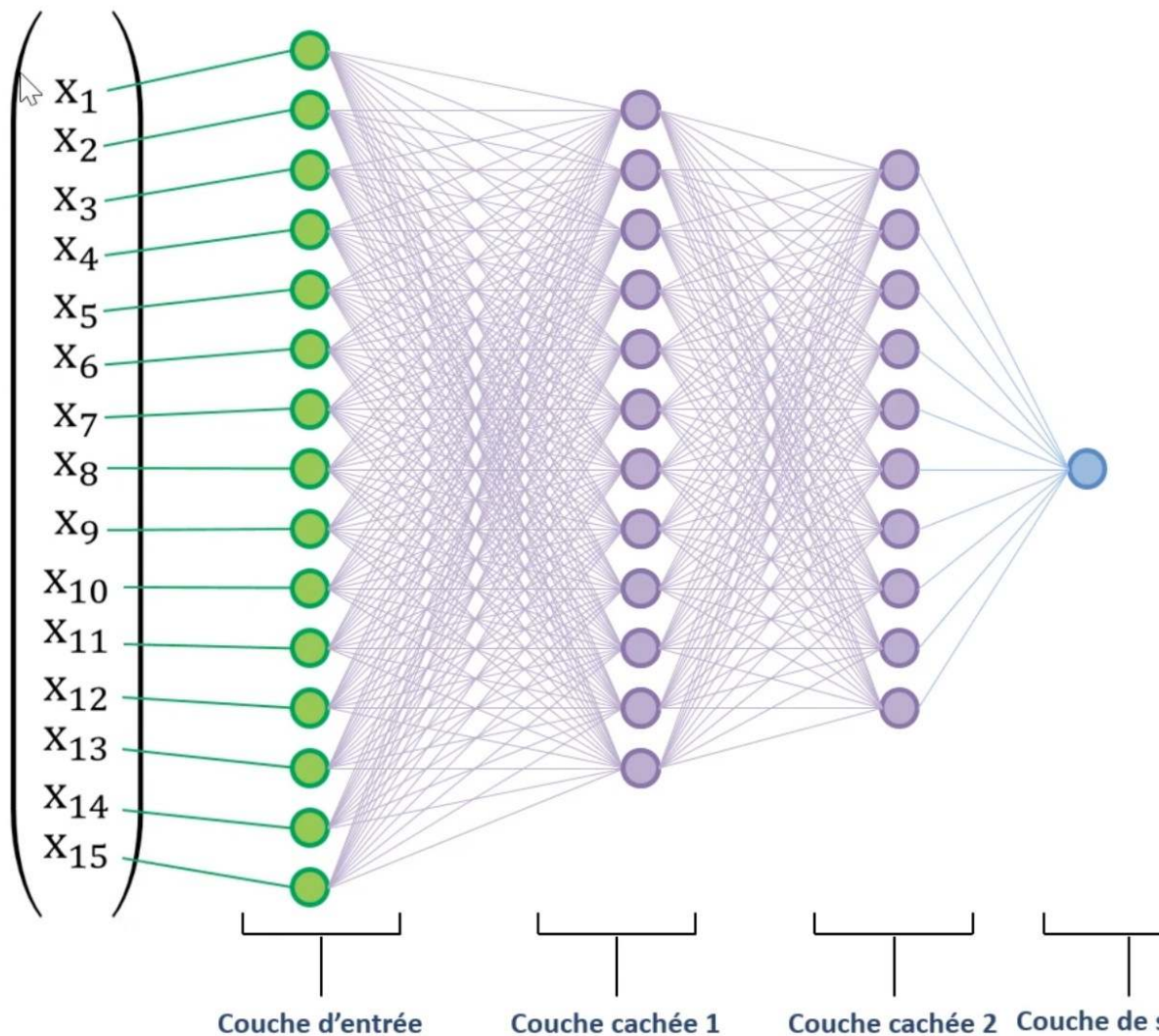
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Perceptron (Rosenblatt 1957)

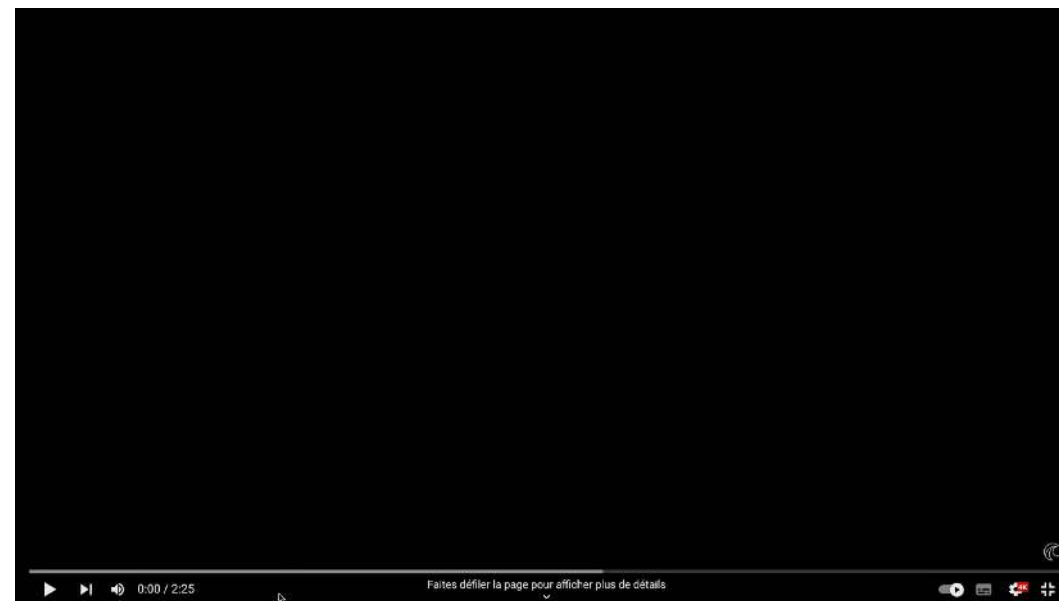


Deep learning



Un exemple pour tout résumer : la voiture autonome

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Transformers (Attention is all you need 2017)

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Attention Is All You Need

Ashish Vaswani*
Google Brain
avaswani@google.com

Noam Shazeer*
Google Brain
noam@google.com

Niki Parmar*
Google Research
nikip@google.com

Jakob Uszkoreit*
Google Research
usz@google.com

Llion Jones*
Google Research
llion@google.com

Aidan N. Gomez*[†]
University of Toronto
aidan@cs.toronto.edu

Lukasz Kaiser*
Google Brain
lukaszkaizer@google.com

Illia Polosukhin*[‡]
illia.polosukhin@gmail.com

Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.0 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature.

1 Introduction

Recurrent neural networks, long short-term memory [12] and gated recurrent [7] neural networks in particular, have been firmly established as state of the art approaches in sequence modeling and transduction problems such as language modeling and machine translation [29, 2, 5]. Numerous efforts have since continued to push the boundaries of recurrent language models and encoder-decoder architectures [31, 21, 13].

*Equal contribution. Listing order is random. Jakob proposed replacing RNNs with self-attention and started the effort to evaluate this idea. Ashish, with Illia, designed and implemented the first Transformer models and has been crucially involved in every aspect of this work. Noam proposed scaled dot-product attention, multi-head attention and the parameter-free position representation and became the other person involved in nearly every detail. Niki designed, implemented, tuned and evaluated countless model variants in our original codebase and tensor2tensor. Llion also experimented with novel model variants, was responsible for our initial codebase, and efficient inference and visualizations. Lukasz and Aidan spent countless long days designing various parts of and implementing tensor2tensor, replacing our earlier codebase, greatly improving results and massively accelerating our research.

[†]Work performed while at Google Brain.

[‡]Work performed while at Google Research.

31st Conference on Neural Information Processing Systems (NIPS 2017), Long Beach, CA, USA.



ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

[ChatGPT Jan 30 Version](#). Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.

Novembre 2022 - ChatGPT

Partie 2. Quelques cas concrets

1. Établir une demande de remise de majoration de TVA
2. Établir une relance de facture
3. Organiser un évènement
4. Mettre en place une campagne marketing sur les réseaux sociaux
5. Analyser un document financier / contrat
6. Établir un prévisionnel
7. Développer un assistant d'aide à la mise en place de la facturation électronique

Autres possibilités des méthodes génératives

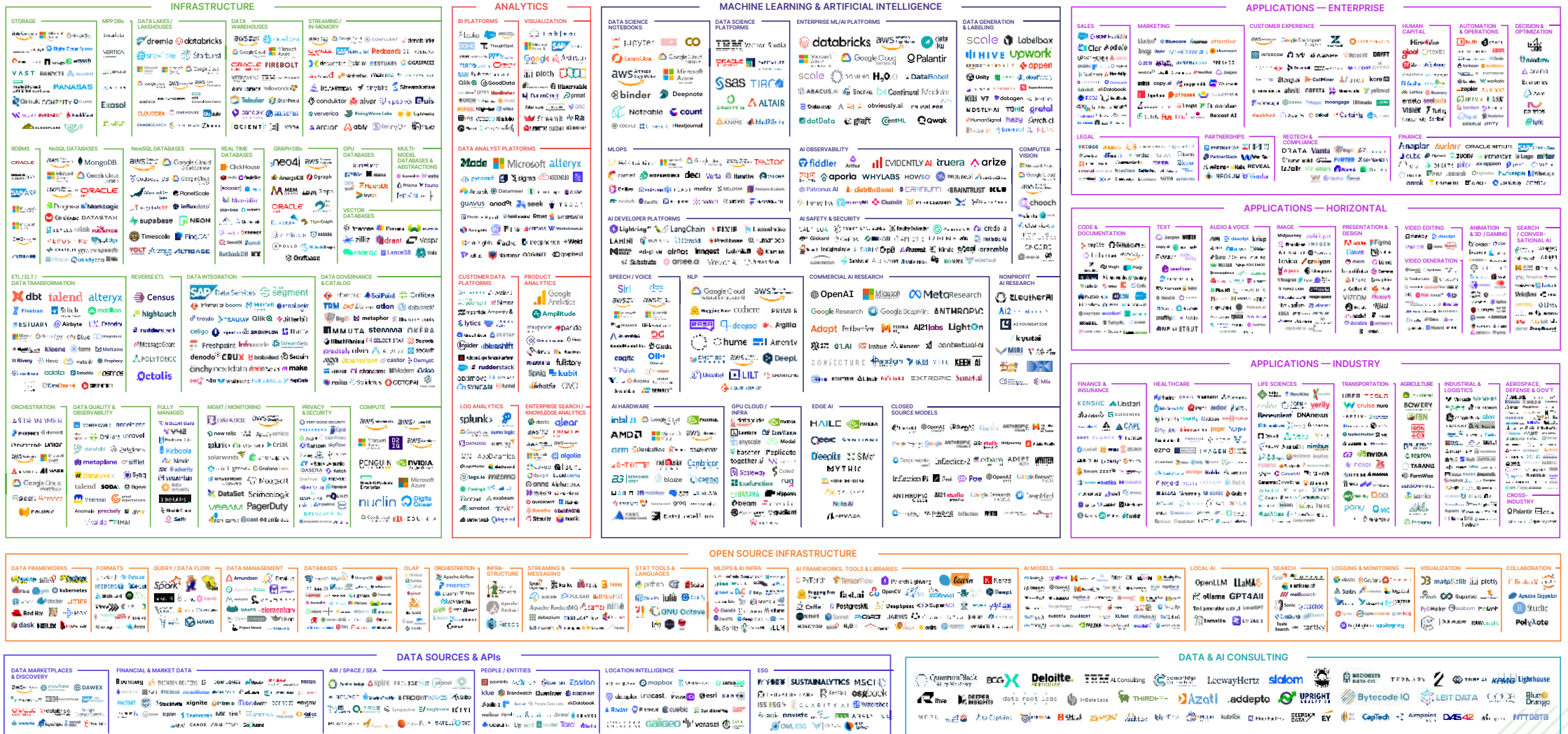
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Novembre 2022 – Open AI / ChatGPT 3.5

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THE 2024 MAD (MACHINE LEARNING, ARTIFICIAL INTELLIGENCE & DATA) LANDSCAPE



Les enjeux sociétaux

La gouvernance des plateformes

Les questions éthiques et juridiques

Notre capacité à identifier les résultats des algorithmes de ML

Conclusion

« ... l'IA transformera sans doute la profession comptable. Les experts-comptables et les commissaires aux comptes qui peuvent combiner leur expertise avec une compréhension de l'IA et des technologies de l'information seront probablement en forte demande. L'IA peut être considérée non pas comme une menace pour ces professions, mais plutôt comme un outil qui peut augmenter leur efficacité et leur permettre de se concentrer sur des tâches à plus haute valeur ajoutée.

L'IA ne peut pas remplacer l'aspect humain du conseil, qui est essentiel pour établir des relations de confiance avec les clients...»



ChatGPT 4

Réponse à la question de l'impact de l'IA sur les métiers du chiffre par Vincent Jolivet



Merci pour votre attention