

Memorization capacity and robustness of neural networks

PhD defense layman's talk

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January 19, 2026

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Artificial Intelligence

Memorization capacity and robustness of neural networks

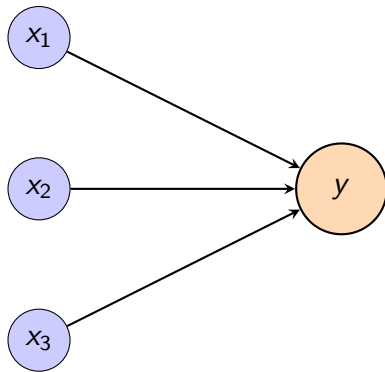
Artificial Intelligence → Machine Learning

Memorization capacity and robustness of neural networks

Artificial Intelligence → Machine Learning → Deep Learning

Memorization capacity and robustness of neural networks

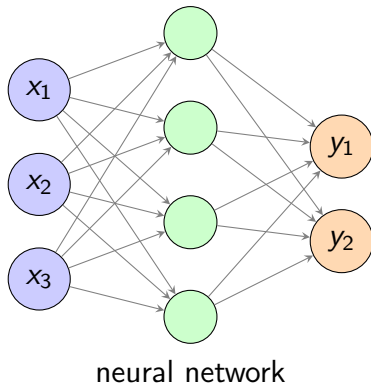
Artificial Intelligence \rightarrow Machine Learning \rightarrow Deep Learning



perceptron

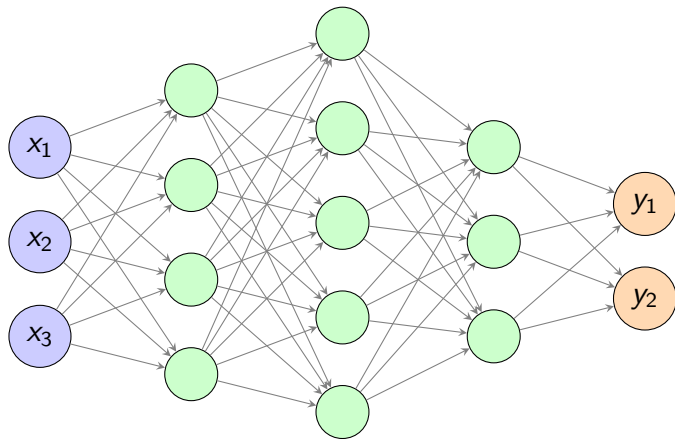
Memorization capacity and robustness of neural networks

Artificial Intelligence \rightarrow Machine Learning \rightarrow Deep Learning



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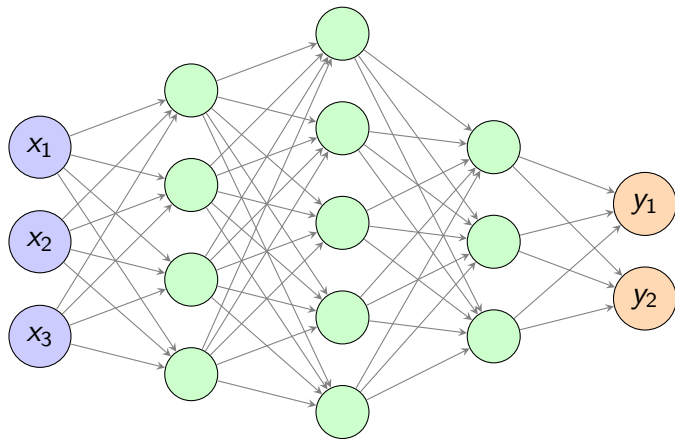
Artificial Intelligence → Machine Learning → Deep Learning











deep neural network

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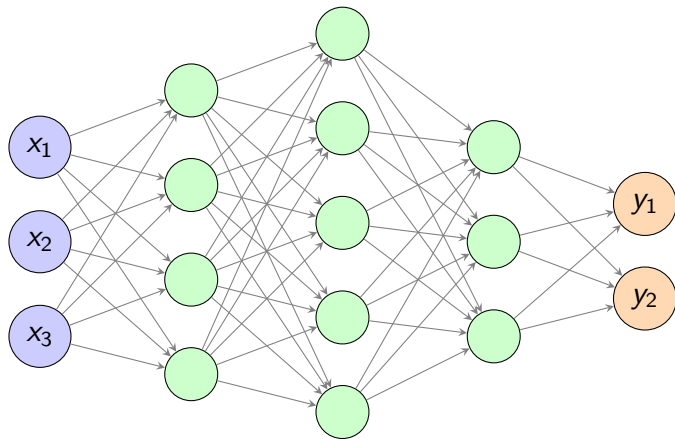


deep neural network









x	y	x	y
	dog		dog
	cat		cat
	dog		cat
	cat		cat
\vdots	\vdots	\vdots	\vdots

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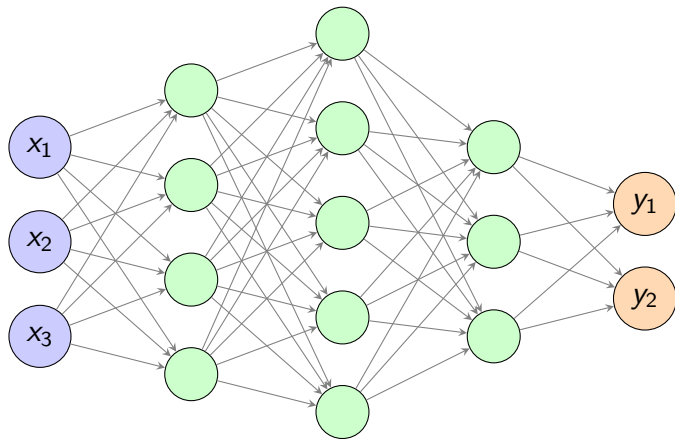


deep neural network









x	y	x	y
	cat		dog
	dog		cat
	dog		dog
	cat		cat
\vdots	\vdots	\vdots	\vdots

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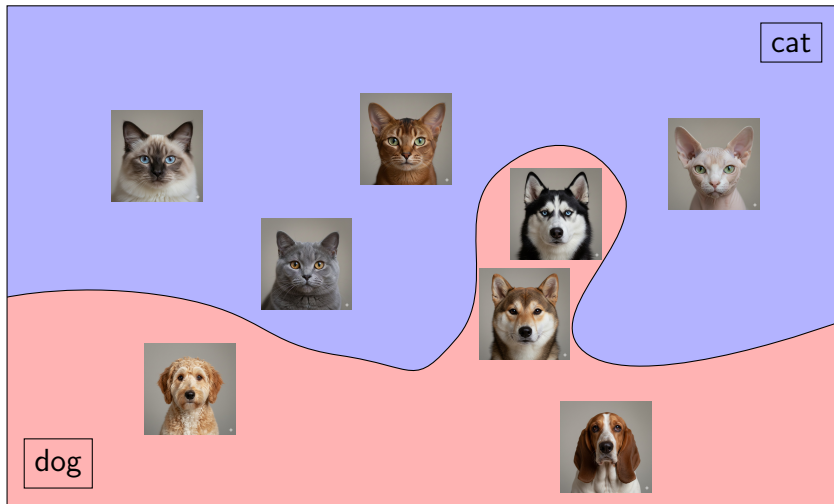


deep neural network

x	y	x	y
	cat		dog
	dog		dog
	cat		dog
	cat		cat
\vdots	\vdots	\vdots	\vdots

Memorization capacity and robustness of neural networks

How large does a neural network need to be to memorize given examples?



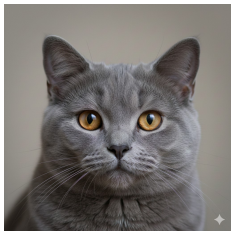
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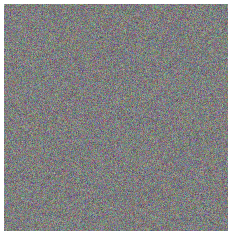
cat

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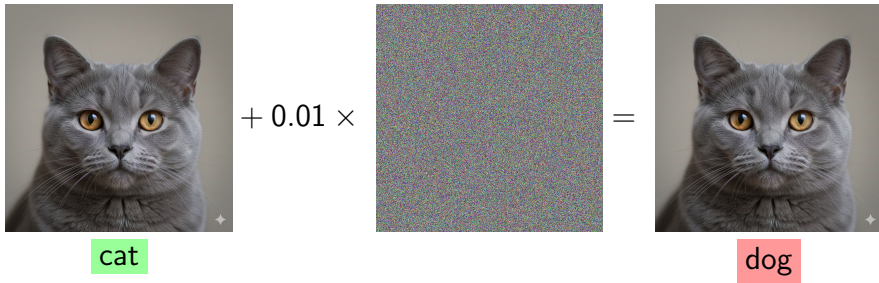


cat

+ 0.01 ×

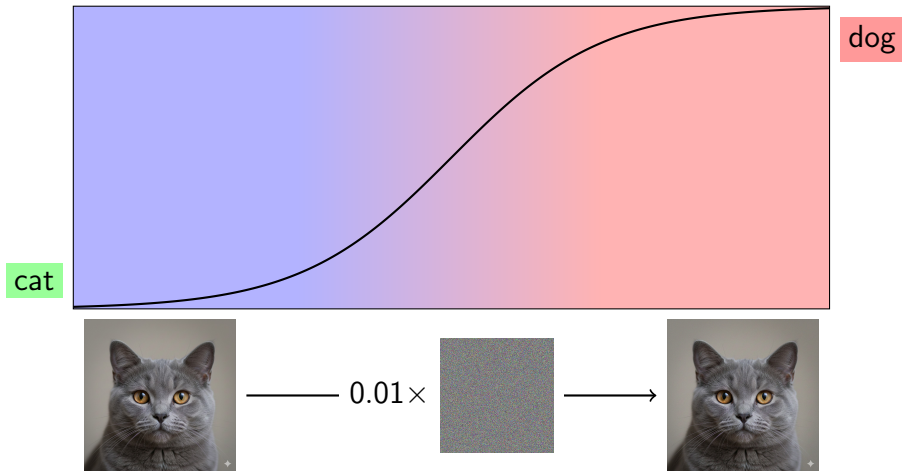


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Memorization capacity and robustness of neural networks

How sensitive are neural networks to small changes in their inputs?



Thank you!