Perceptron Timeline

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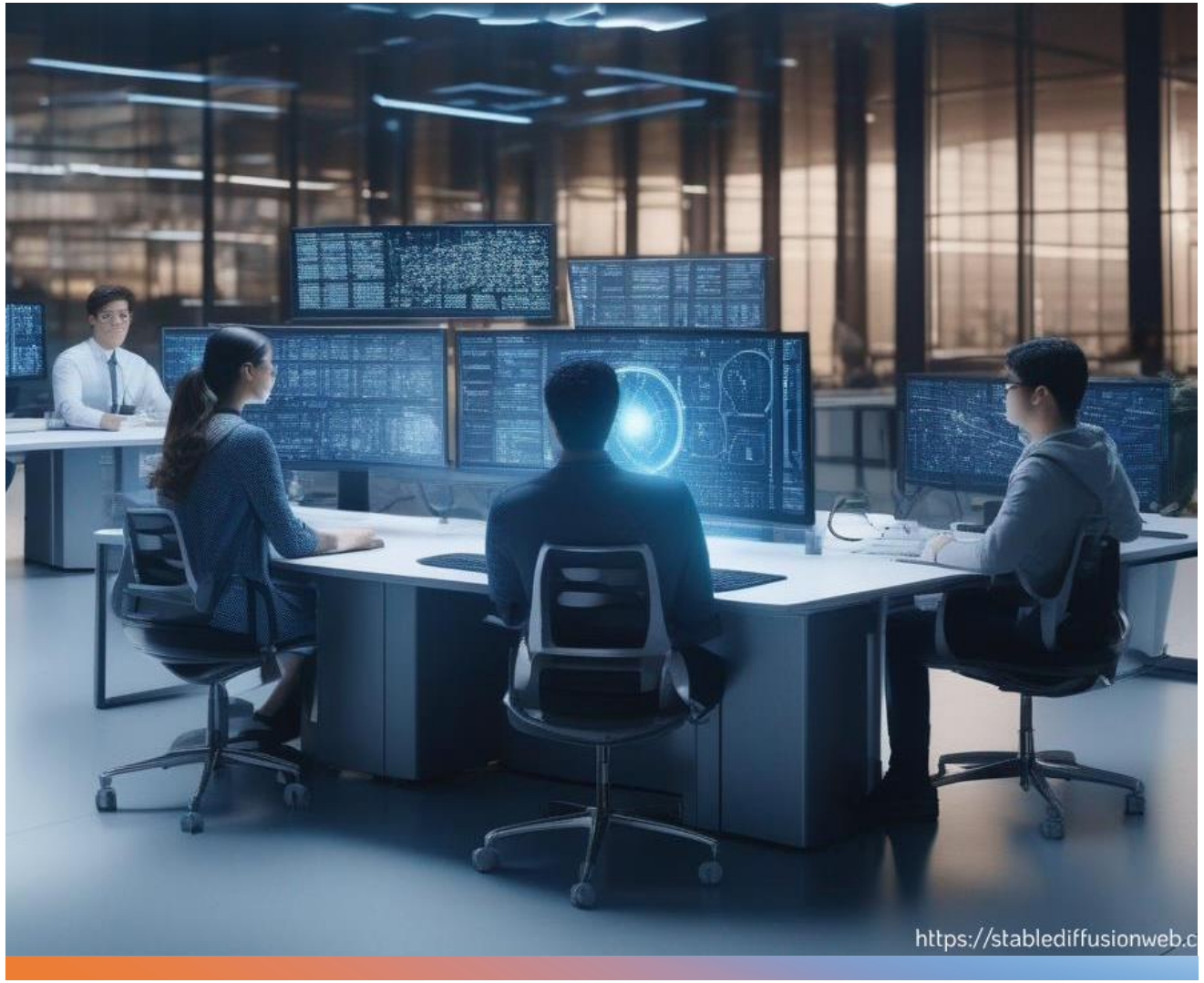


1943

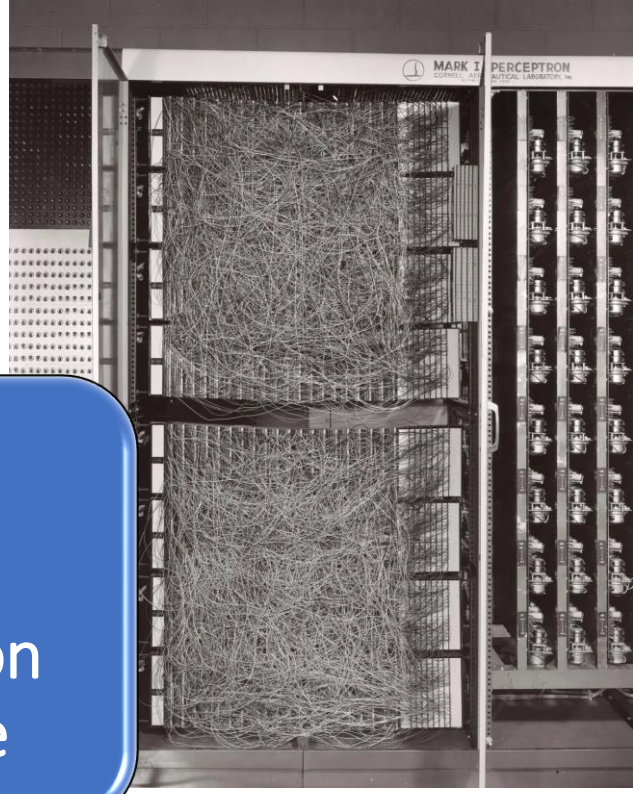
Concept Introduction

1957

Perceptron Design

1958

First Perceptron Machine

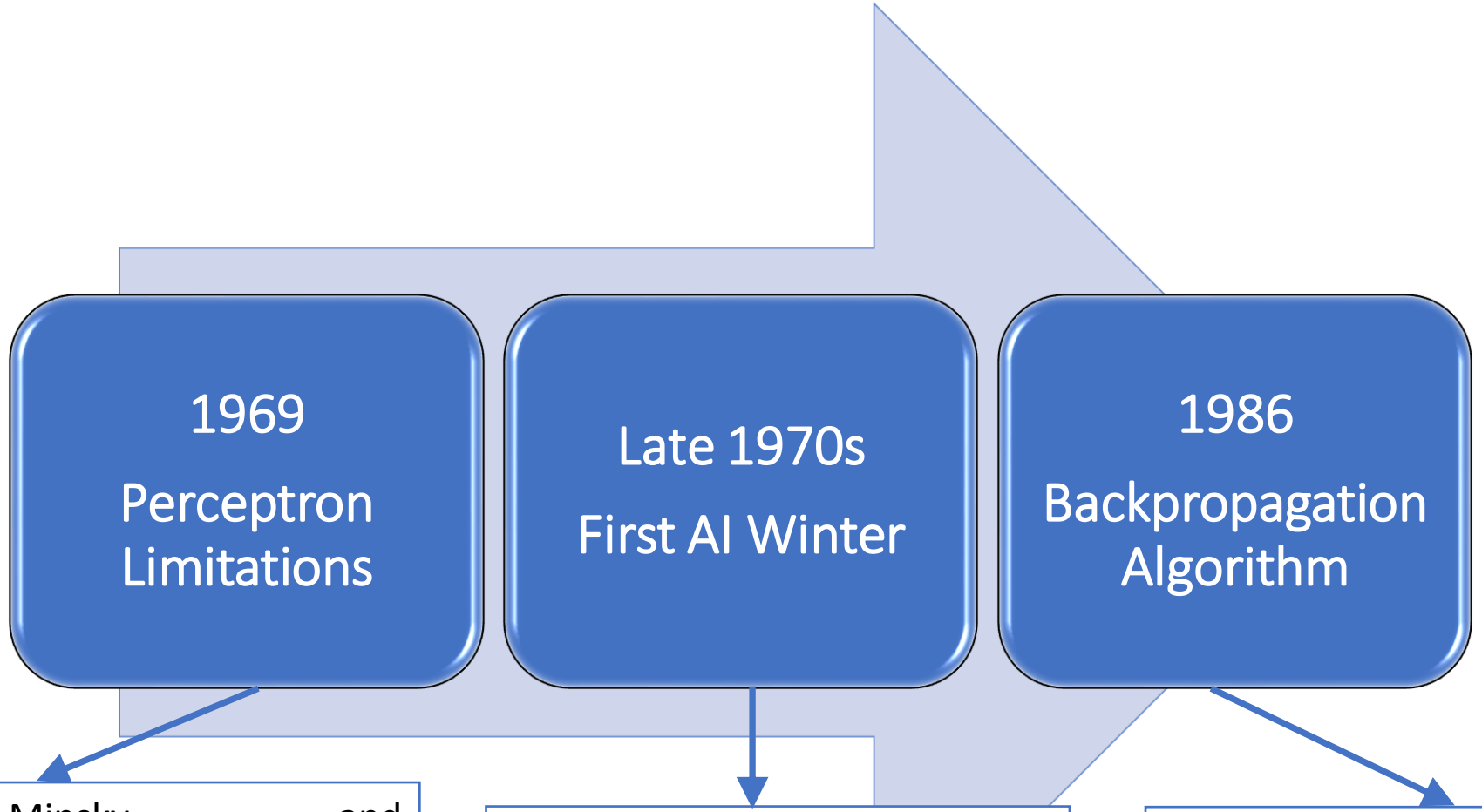


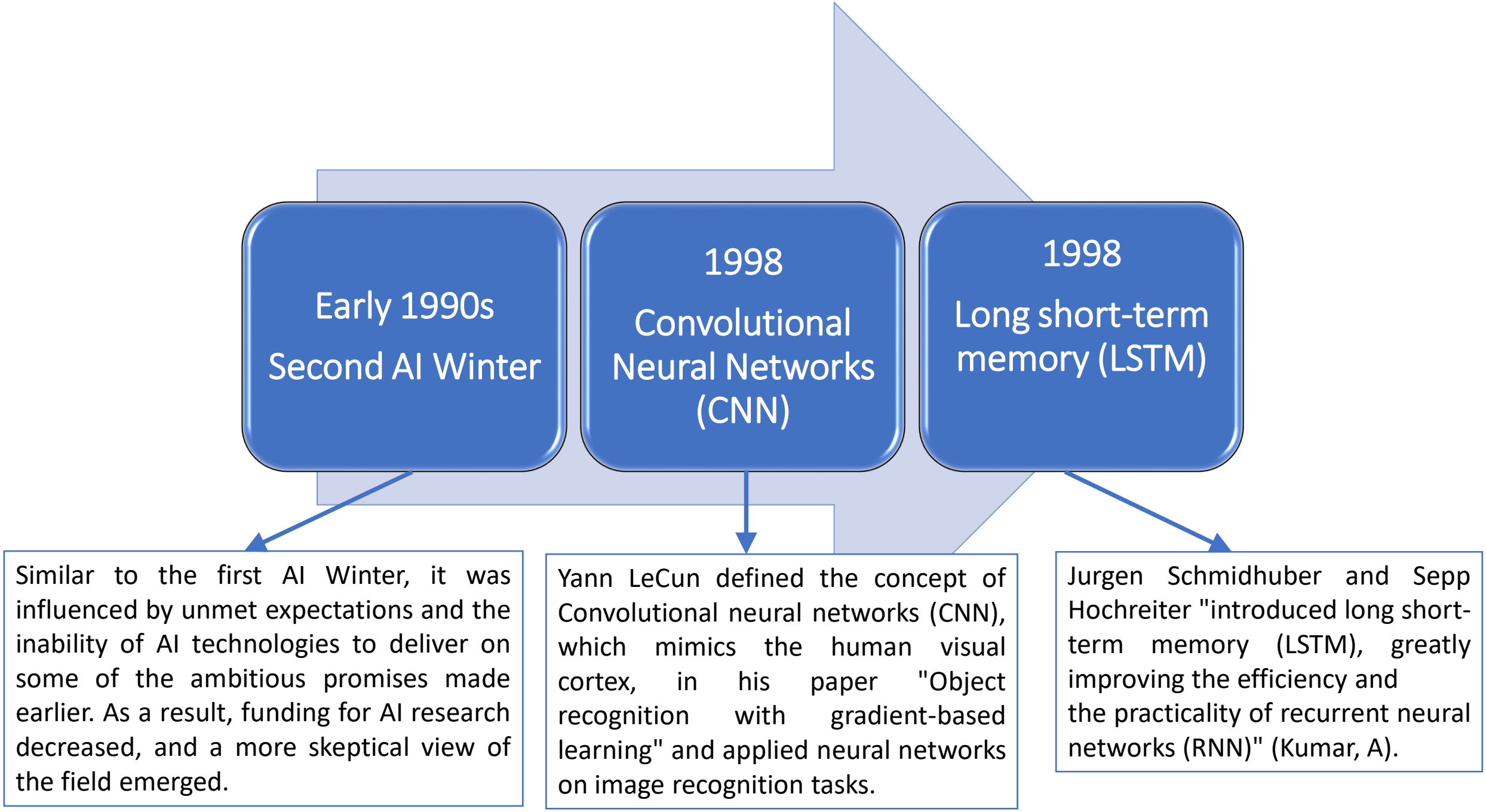
Strickland, E. (2021, September 30)

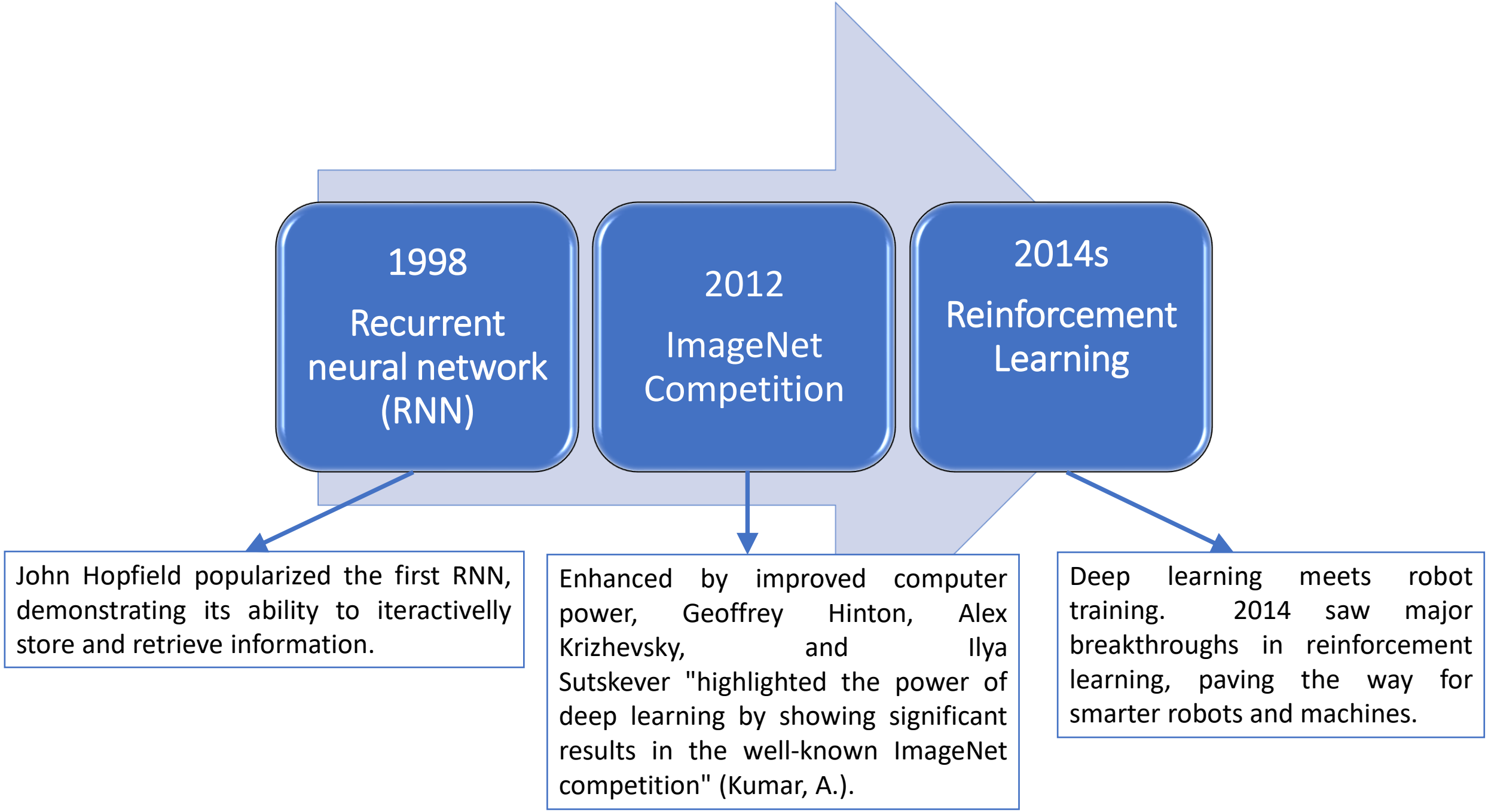
An artificial neuron was proposed as a computational model of the “nerve net” in the brain.
"A Logical Calculus of Ideas Immanent in Nervous Activity” paper by Warren McCulloch and Walter Pitts.

Inspired by McCulloch and Pitts’ work, Frank Rosenblatt introduced the Perceptron algorithm. According to him, it mimicked the "neural structure of the brain and showed an ability to learn".

Mark I Perceptron was developed by Rosenblatt and his team at the Cornell Aeronautical Laboratory. It could recognize simple geometric shapes and image classification tasks.


1969
Perceptron Limitations
Late 1970s
First AI Winter
1986
Backpropagation Algorithm
Marvin Minsky and Seymour Papert proved in their book "Perceptrons" that "the Perceptron could only perform very basic tasks", showing that single-layer perceptrons had limitations in solving complex non-linear problems, leading to a decline in interest in neural networks.
Over-optimistic promises and limitations exposed in single-layer perceptrons led to a decline in funding and research interest in AI, specifically neural networks, which needed specially more computer power.
A method for training multilayer neural networks. Was rediscovered and reported by David Rumelhart, Geoffrey Hinton, and Ronald Williams in the paper "Learning representations by back-propagating errors".


Early 1990s
Second AI Winter
1998
Convolutional Neural Networks (CNN)
1998
Long short-term memory (LSTM)
Similar to the first AI Winter, it was influenced by unmet expectations and the inability of AI technologies to deliver on some of the ambitious promises made earlier. As a result, funding for AI research decreased, and a more skeptical view of the field emerged.
Yann LeCun defined the concept of Convolutional neural networks (CNN), which mimics the human visual cortex, in his paper "Object recognition with gradient-based learning" and applied neural networks on image recognition tasks.
Jurgen Schmidhuber and Sepp Hochreiter "introduced long short-term memory (LSTM), greatly improving the efficiency and the practicality of recurrent neural networks (RNN)" (Kumar, A).


1998
Recurrent neural network (RNN)
2012
ImageNet Competition
2014s
Reinforcement Learning
John Hopfield popularized the first RNN, demonstrating its ability to iteractivelly store and retrieve information.
Enhanced by improved computer power, Geoffrey Hinton, Alex Krizhevsky, and Ilya Sutskever "highlighted the power of deep learning by showing significant results in the well-known ImageNet competition" (Kumar, A.).
Deep learning meets robot training. 2014 saw major breakthroughs in reinforcement learning, paving the way for smarter robots and machines.

References

- Kumar, A. (2021, January 10). Historical Dates & Timeline for Deep Learning. Analytics Yogi. Retrieved January 23, 2024, from https://vitalflux.com/historical-dates-timeline-for-deep-learning/
- Strickland, E. (2021, September 30). THE TURBULENT PAST AND UNCERTAIN FUTURE OF ARTIFICIAL INTELLIGENCE. IEEE Spectrum. Retrieved January 23, 2024, from https://spectrum.ieee.org/history-of-ai