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A Brief Timeline

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DSBD

UFPR

Timeline

1763

Bayes Theorem

1763 - Thomas Bayes.
Introduced Bayes' Theorem, including the concepts of prior and posterior probabilities.

Timeline

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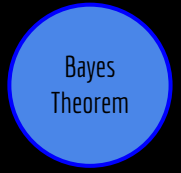

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Bayes Theorem

1943 - Warren McCulloch & Walter Pitts. Human neuron modeled as an electronic perceptron.

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Bayes Theorem

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Electronic Neuron

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1957 - Frank Rosenblatt. Implementation of a perceptron on an IBM 704 computer.

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Rosenblatt's Perceptron

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Bayes Theorem

1600~1700

Calculus

~1636 - Pierre de Fermat.
Initial ideas of infinitesimal calculus used by Newton and Leibniz.

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~1687 - Isaac Newton & Gottfried Wilhelm Leibniz.
Creation of modern differential and integral calculus, including its rules and some classical formulas, such as the chain rule.

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1969 - Kunihiko Fukushima proposes the ReLU activation.

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1970/1971 - Seppo Linnainmaa & Paul Werbos. Development of backpropagation.

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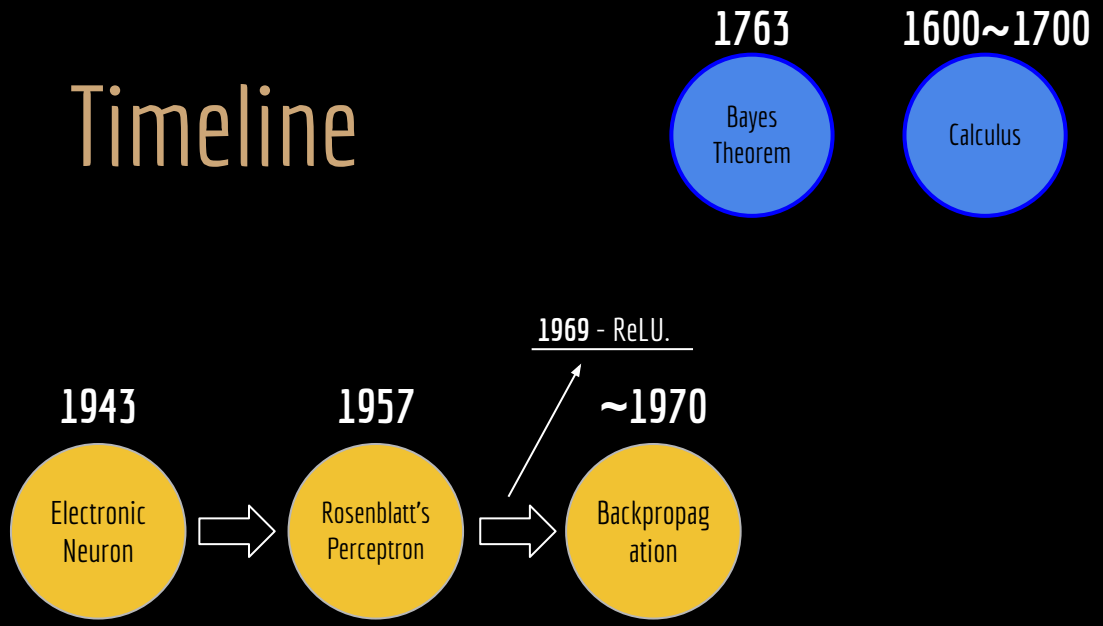
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1989 - Yann LeCun.
CNN to recognize digits without manual tuning.

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1969 - ReLU.

1980 - Kunihiko Fukushima proposes the Neocognitron, the first CNN with convolution and pooling layers.

1989 - Yann LeCun.
CNN to recognize digits without manual tuning.

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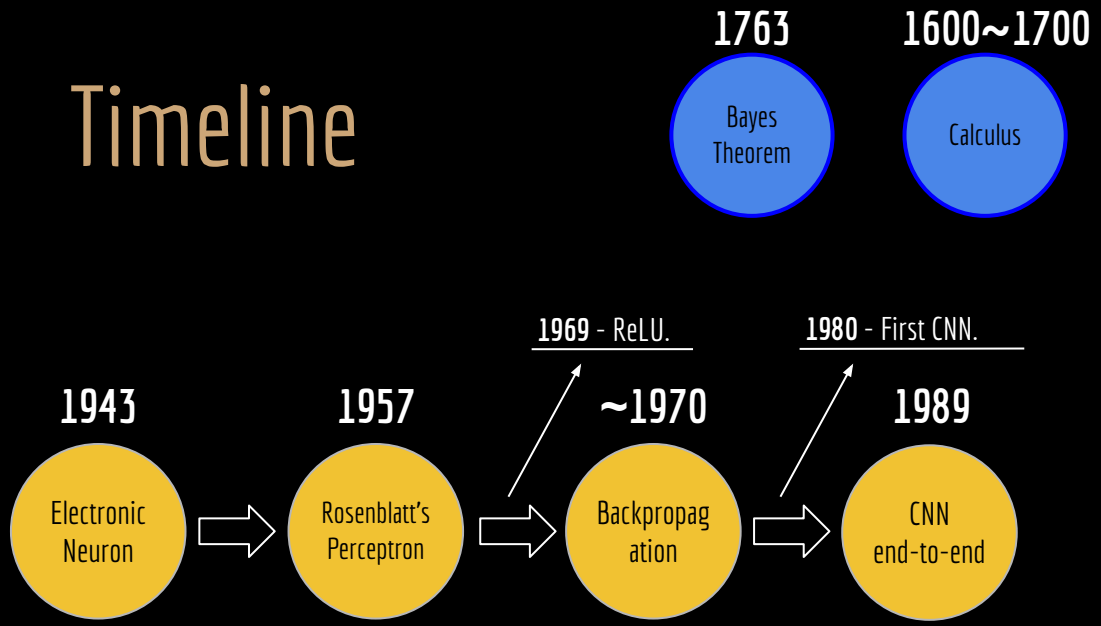
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2012 - Alex Krizhevsky, Ilya Sutskever & Geoffrey Hinton.
AlexNet wins the ImageNet competition.

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2009 - Rajat Raina, Anand Madhavan, and Andrew Y. Ng use 30 GTX 280 GPUs to train a 100M-parameter model.

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AlexNet wins the ImageNet competition.

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2011 - Xavier Glorot, Antoine Bordes, and Yoshua Bengio discover that ReLU works well in deep networks.

2009 - Rajat Raina, Anand Madhavan, and Andrew Y. Ng use 30 GTX 280 GPUs to train a 100M-parameter model.

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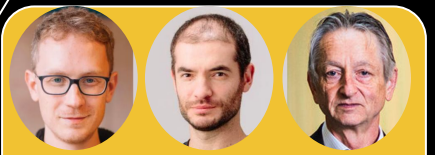

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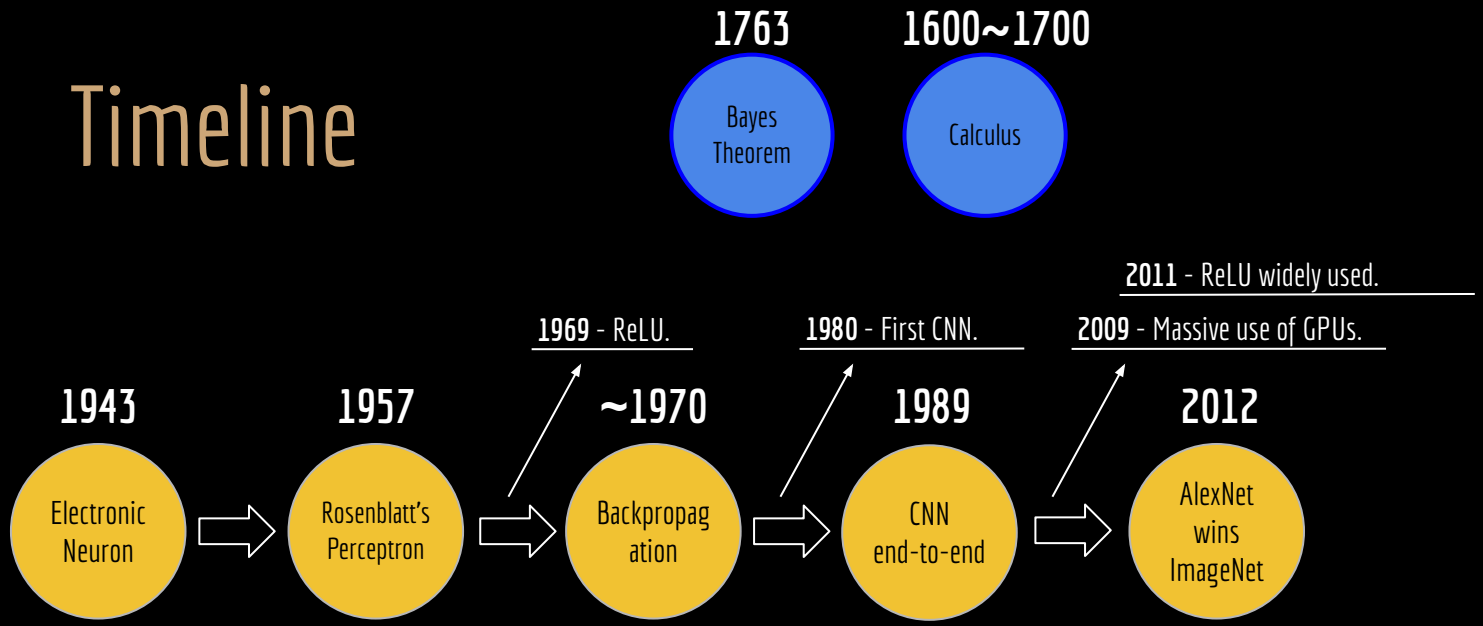
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2009 - Massive use of GPUs.
2011 - ReLU widely used.

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~1948 - Claude Shannon.
Paper *A Mathematical Theory of Communication.*

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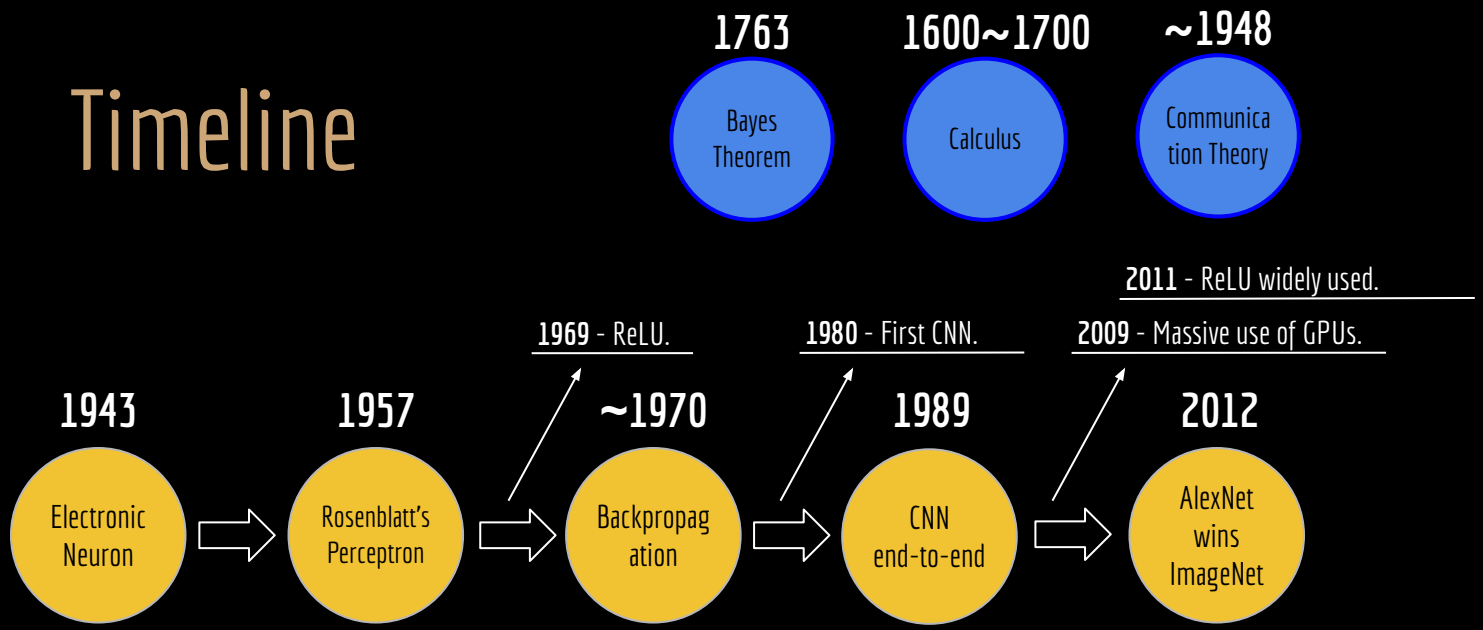
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1950 The Imitation Game

1950 - Alan Turing.
Proposed the Imitation Game (the Turing Test) to assess whether machines exhibit human-like behavior.

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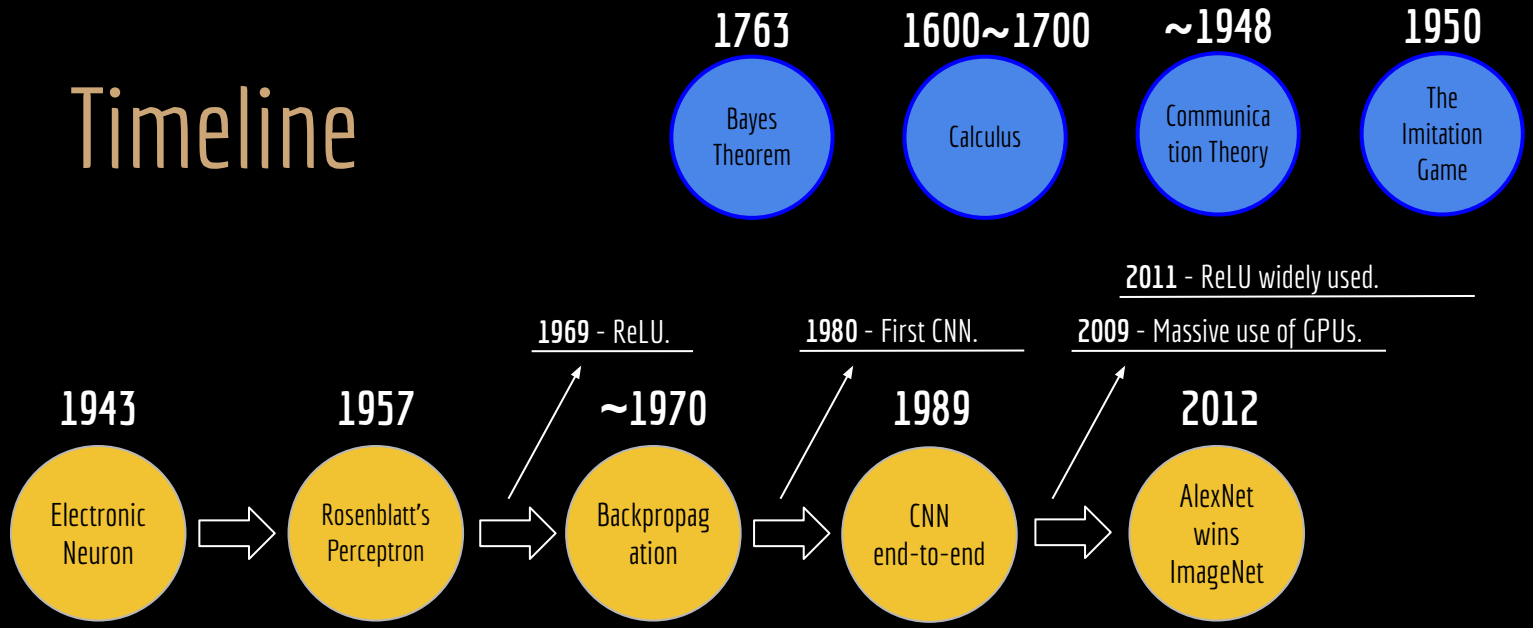
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2014 - Dzmitry Bahdanau, KyungHyun Cho & Yoshua Bengio
Transformers for text translation.

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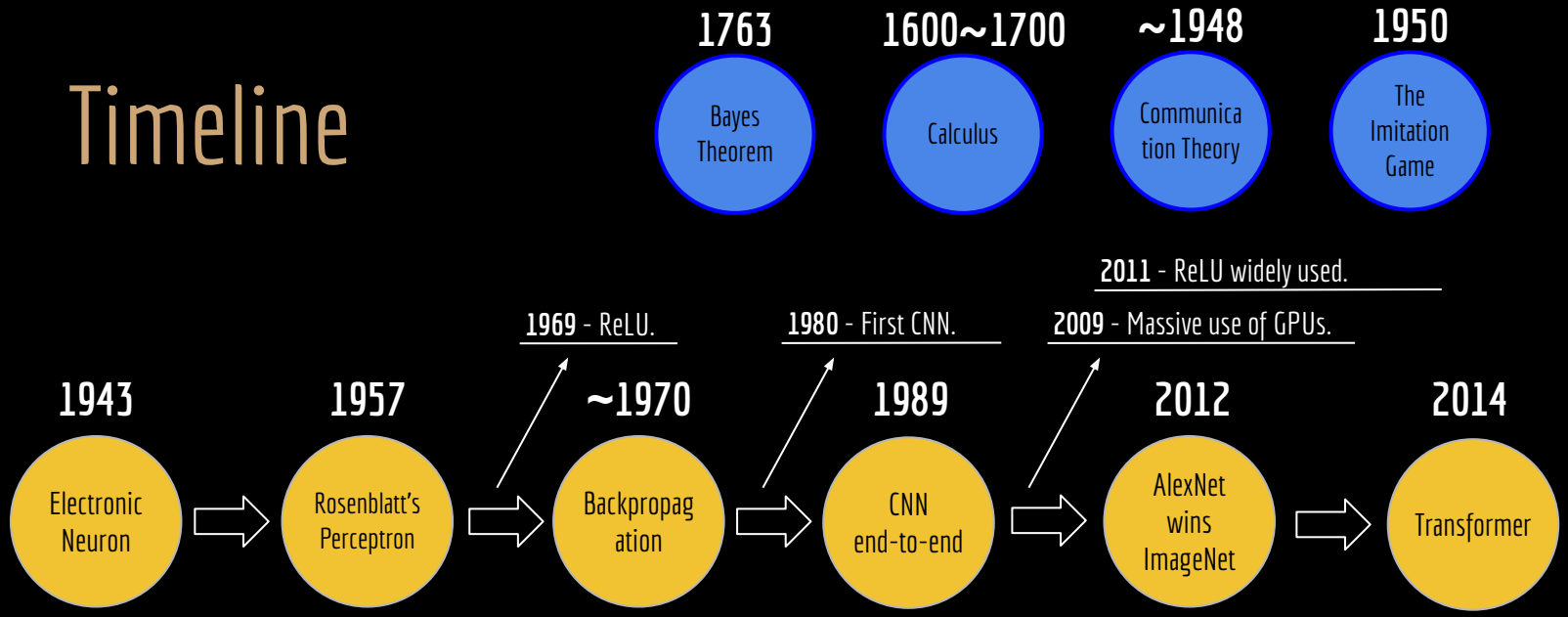
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2015 - Patterson et. al.
Specialized hardwares, such as TPUs.

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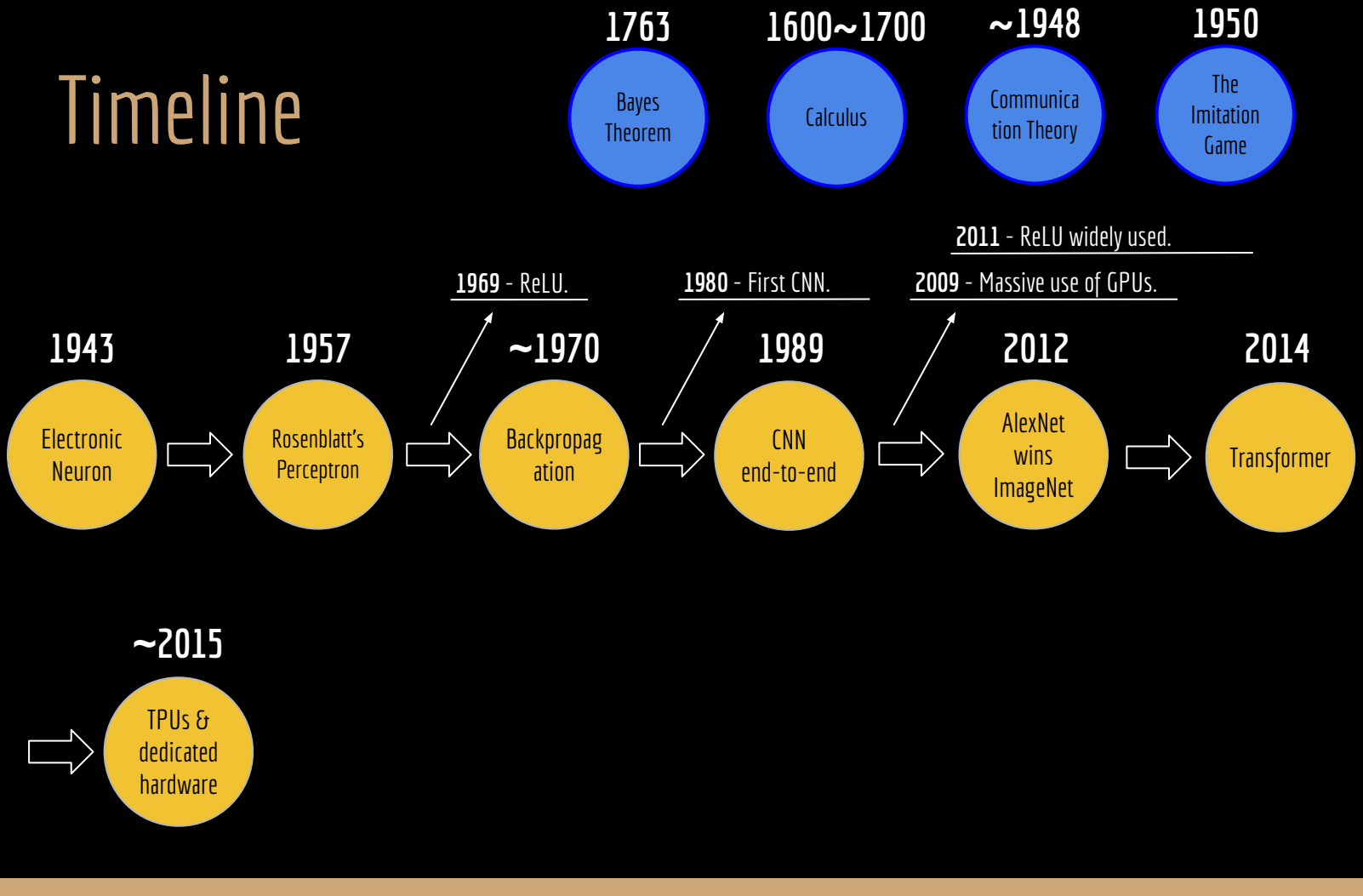
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TPUs & dedicated hardware

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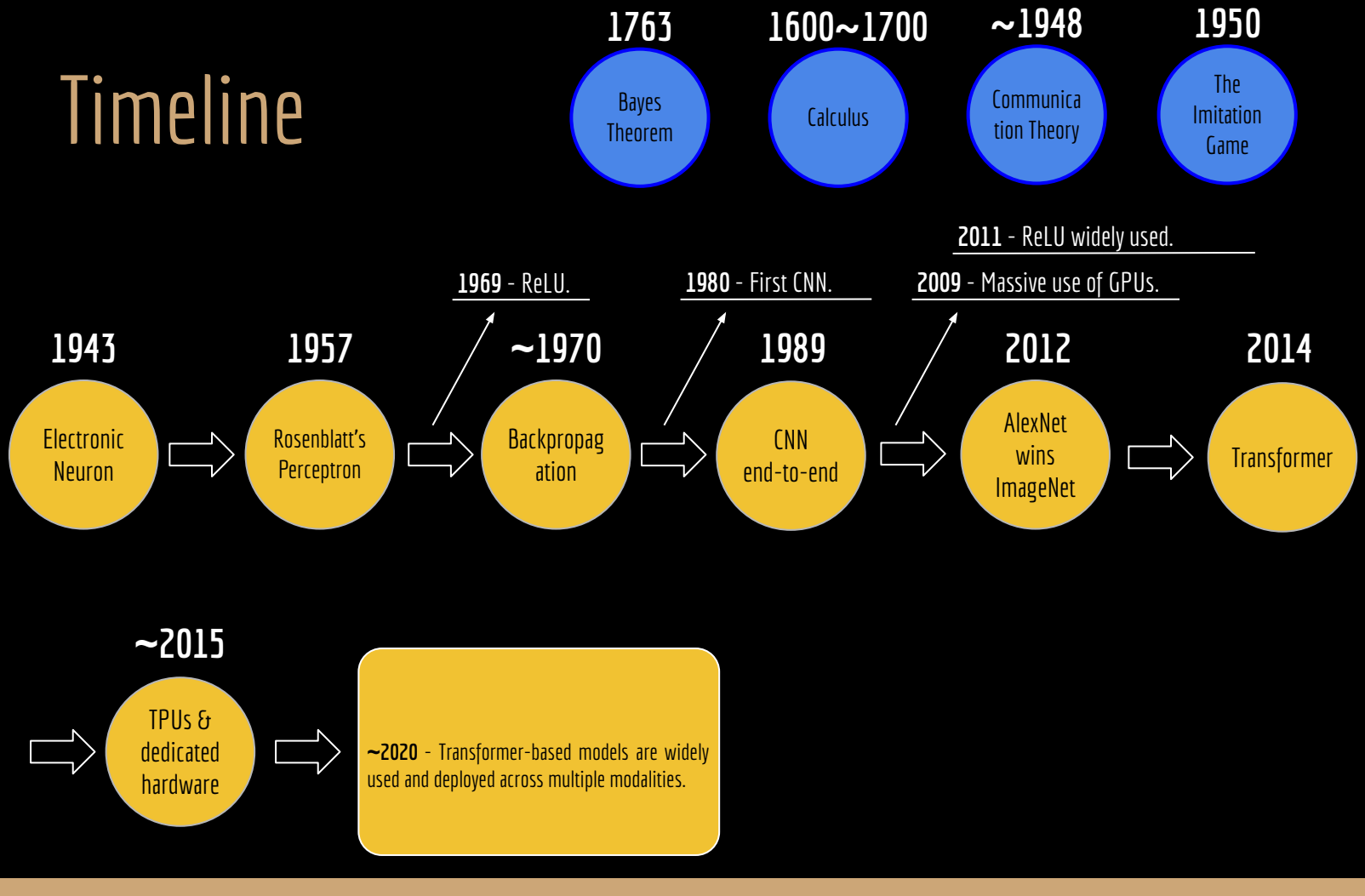
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TPUs & dedicated hardware
~2020 - Transformer-based models are widely used and deployed across multiple modalities.

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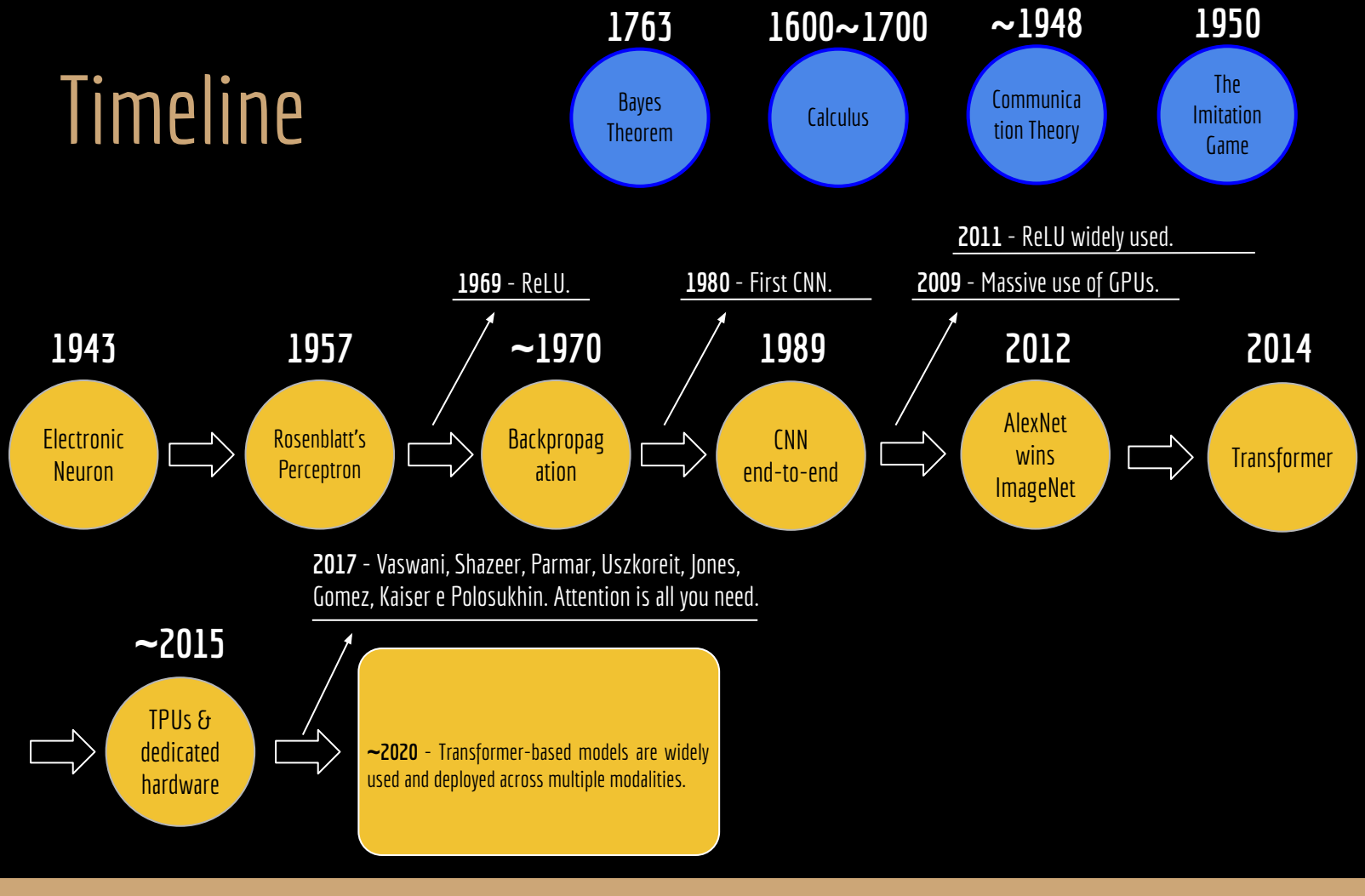
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2017 - Vaswani, Shazeer, Parmar, Uszkoreit, Jones, Gomez, Kaiser e Polosukhin. Attention is all you need.
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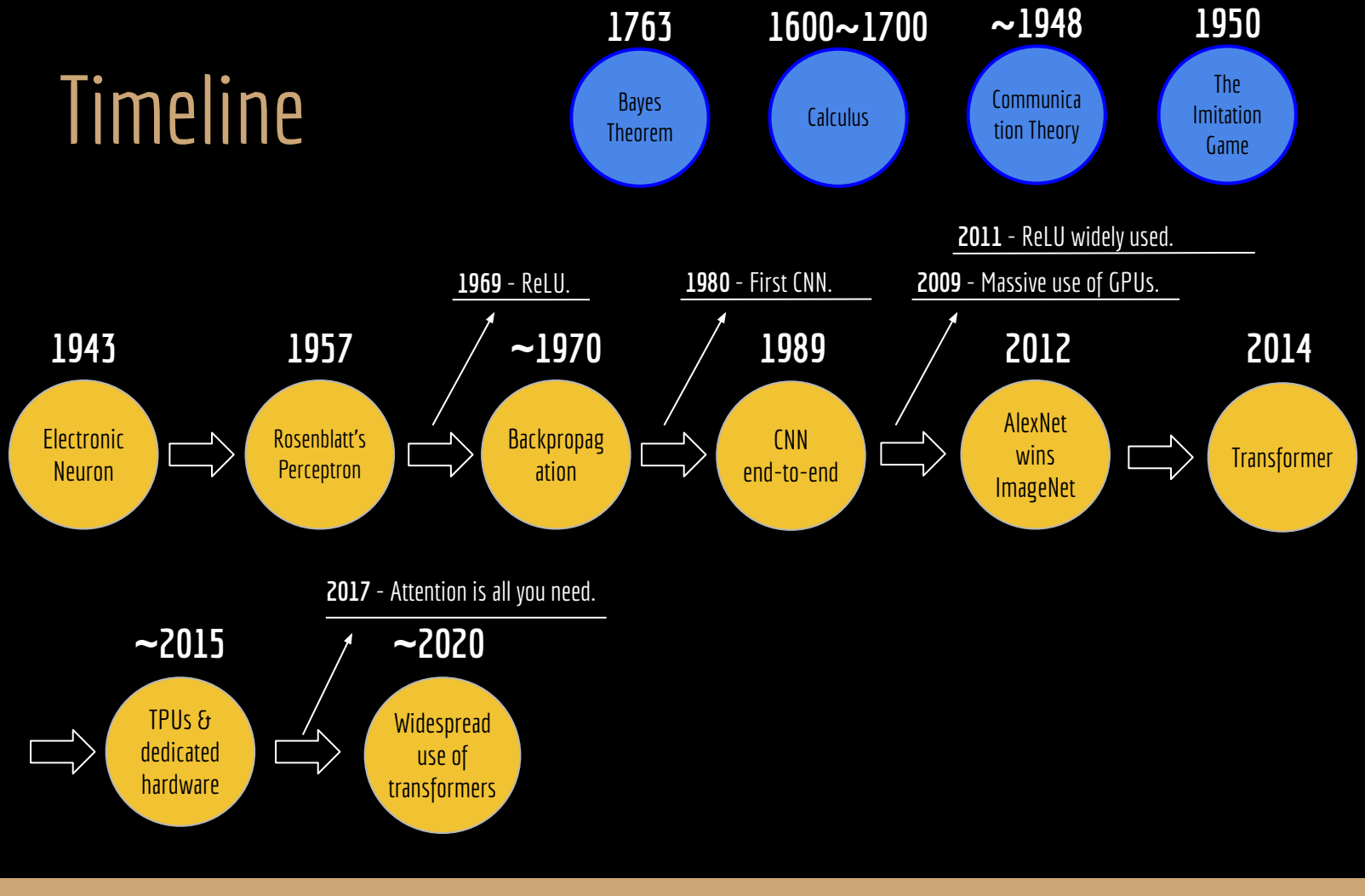
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Widespread use of transformers

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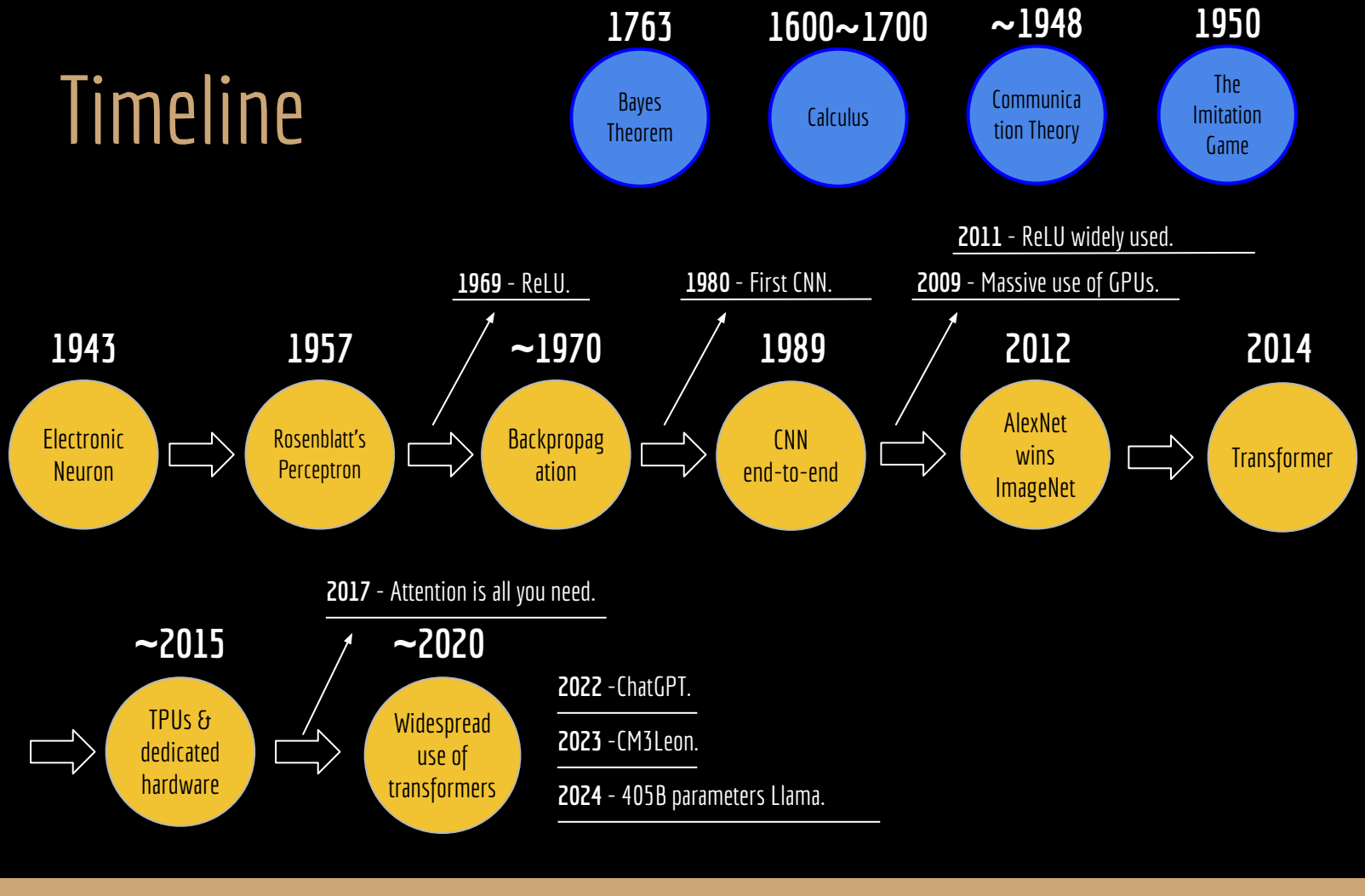
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Widespread use of transformers
2022 -ChatGPT.
2023 -CM3Leon.
2024 - 405B parameters Llama.

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Some questions for › 2025:

How to reduce the computational cost?

How to learn continuously?

How to embed reasoning into models?

How to model causality?

...

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