FROM KNOWLEDGE TO INTELLIGENCE: INTRODUCTION TO AI

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AI CAPABILITIES EXPAND RAPIDLY

Agriculture

Medicine

Education

Climate

Music

Energy grids

Marketing

WITH A FEW DOWNSIDES

Predictive policing algorithms are racist. They need to be dismantled.

News | Published: 12 September 2012

Facebook experiment boosts US voter turnout

Lawyer Used ChatGPT In Court—And Cited Fake Cases. A Judge Is Considering Sanctions

iTutorGroup to Pay $365,000 to Settle EEOC Discriminatory Hiring Suit

Cyber Security + Add to myFT

Arup lost $25mn in Hong Kong deepfake video conference scam

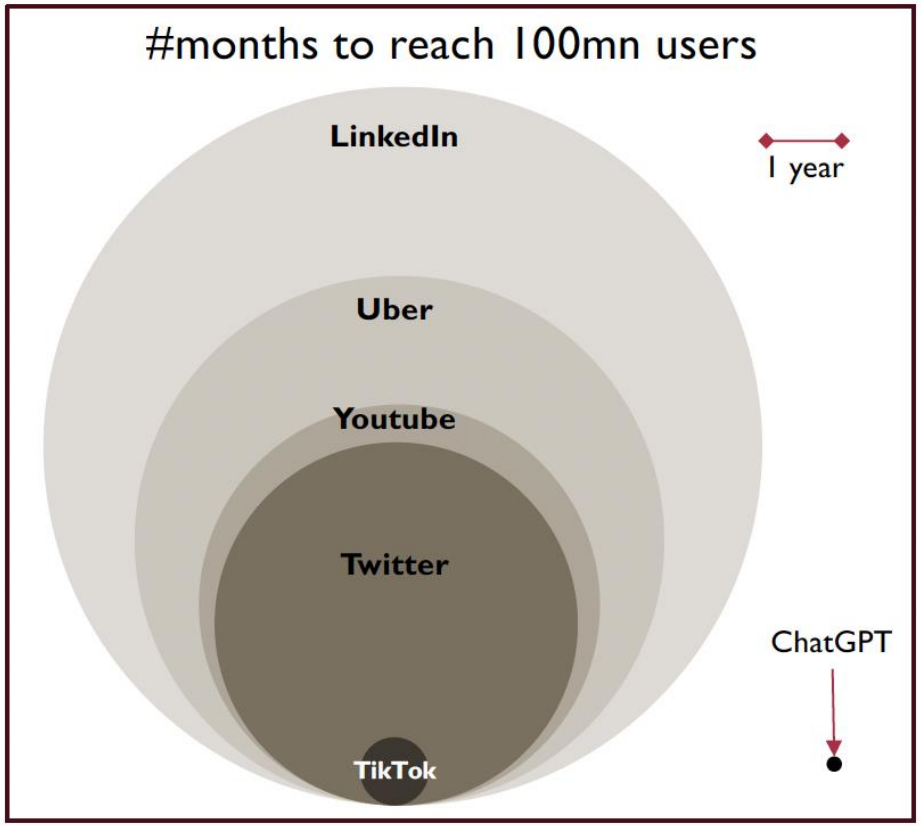
Sources: Nature, Financial Times, MIT Technology Review, EEOC, Forbes

THE AI HYPE – SOME KEY FIGURES

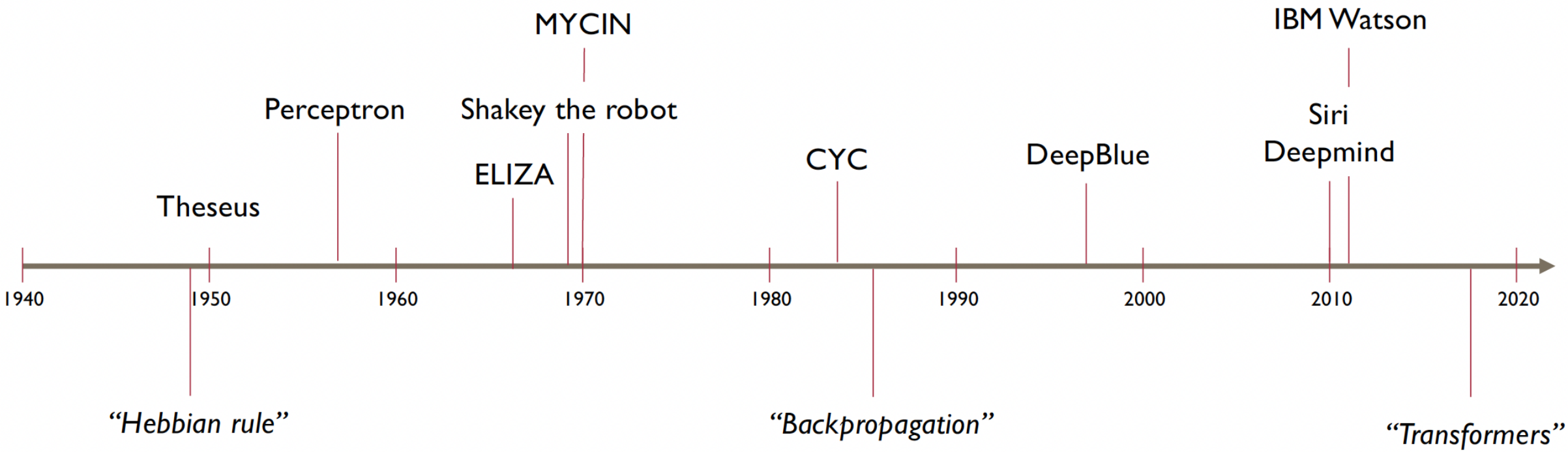
OpenAI valuation rose from 1bn to 86bn since Jan. 2019 **+8500%**

Nvidia capitalization rose from 93bn to 2973bn since Jan. 2019 **+3100%**

Global AI investments rose from 2bn to 120bn between 2013 and 2023 **+5900%**



A BRIEF LOOK BACK



Decoder
Node
Validation dataset
Cost function
Generalization
Clustering
Token
Emergence
Output layer
Training set
Underfitting
Generative adversarial network
Complexity barrier
Cost function
Unstructured data
Hidden layer
Gradient descent
LLM
Classification
Singularity
Transformers
Naive bayes
LoRa
Generative pre-trained transformer
Weights
Backpropagation
Bias value
Generator
Unsupervised learning
Deep learning
K nearest neighbor
Encoder
Reward function
Variance
Convergence
Supervised learning
Discriminator
Testing set
Feature extraction
K means
LSTM autoencoders
Labelled data
Neural network
Input layer
Filter
Overfitting
Expert systems
recurrent neural network
Temperature
Feedback loop
Perceptrons
Weak AI
Deployment
Strong AI
Regression
convolutional neural network
Rules-based systems
Algorithms
Reinforcement learning
Pooling layer
NP-Complete
Attention mechanism
Ensemble modelling
Output signal
Activation function
Feature map
Decision trees

SELECTED KEY CONCEPTS

Supervised learning

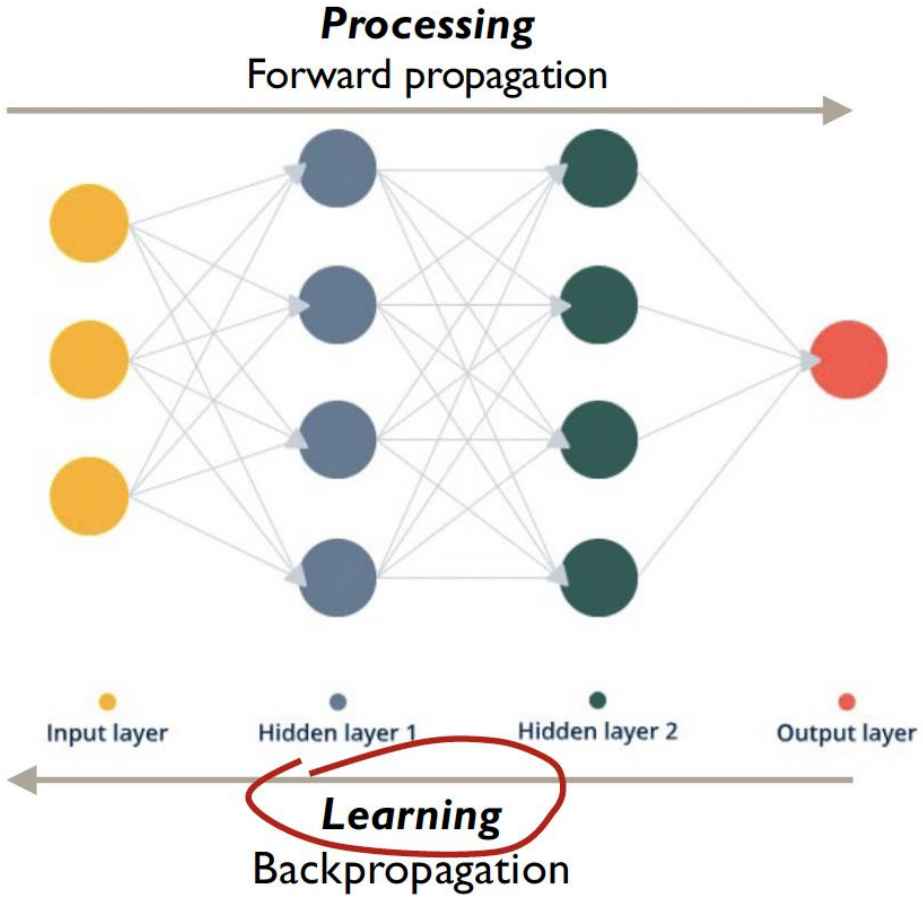
Unsupervised learning

Reinforcement learning

Deep learning

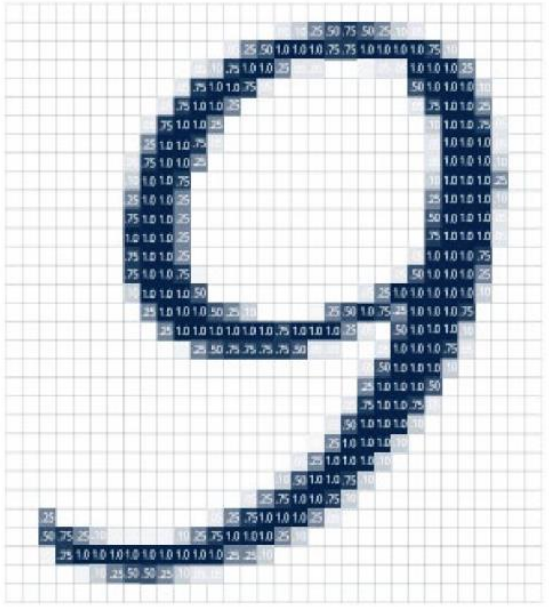
Generative Adversarial Network

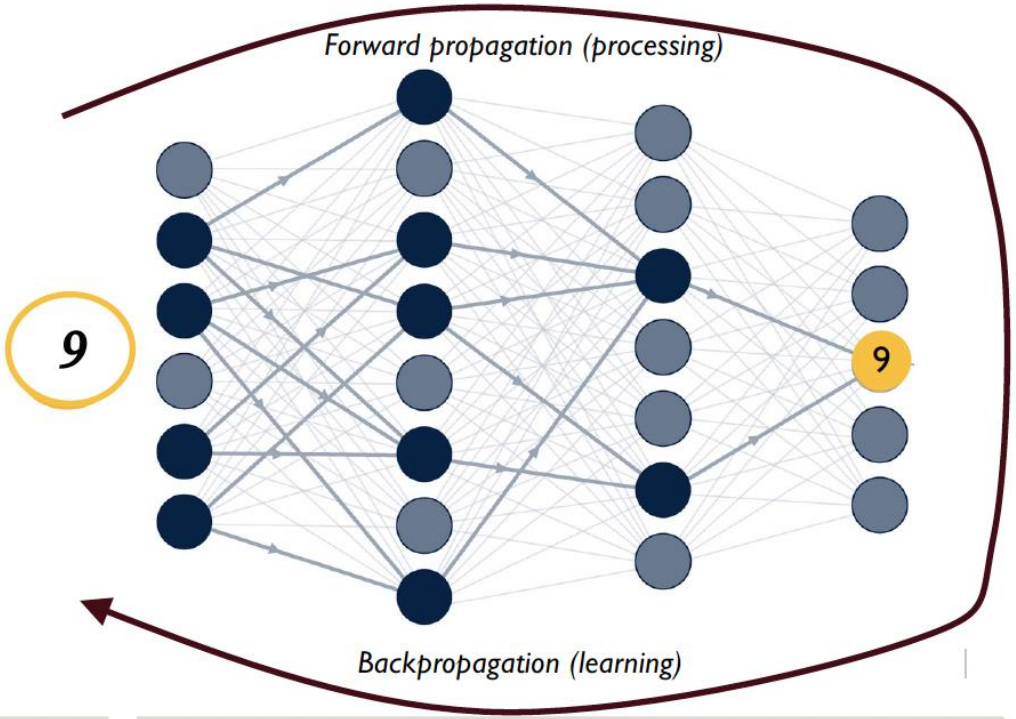
Backpropagation

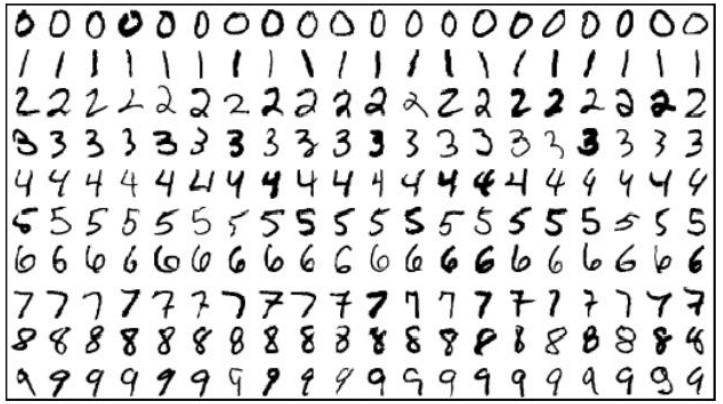


Picture credit: Oxford University

CONCRETELY – HANDWRITING RECOGNITION TRAINING







Numbers are broken down into their composing pixels. Labelled data is fed to neural network

Network adjusts weights and biases via iterations of forward & backpropagation until it finds the right "path"

Process is repeated with multiple variations of handwriting to improve generalization

AI MAIN PITFALLS

Privacy

Data exploitation, tracking, prediction, profiling

Transparency

Explainability of the model's outputs

Bias

Reproduction of human biases in AI training data

WHAT'S NEXT?

Tendance 2024

- Shock of reality
- Multimodal AI
- Regulation
- Model optimization

Artificial General Intelligence

"Intelligence invents, the spirit creates. Intelligence knows the art of dominating nature, the spirit aspires to surpass itself, to become greater than itself, a properly human vital dynamic [...] Such is the fecundity specific to the spirit, which must be distinguished from the efficiency specific to intelligence."

M. Castillo & R. Leroy-Castillo, *La raison d'agir*, 2023

"The characteristic of the creative spirit is to reinvent oneself by understanding. It does not accumulate knowledge but resurrects the inspiration that generated it. Its culture is not a private good, but a history that writes its endless discovery of the world.."

M. Castillo, *Faire renaissance*, 2016