



# HISTORY OF AI

# BEGINNING OF ARTIFICIAL INTELLIGENCE



COMPUTERS ARE MADE IN  
PART TO COMPLETE HUMAN  
TASKS

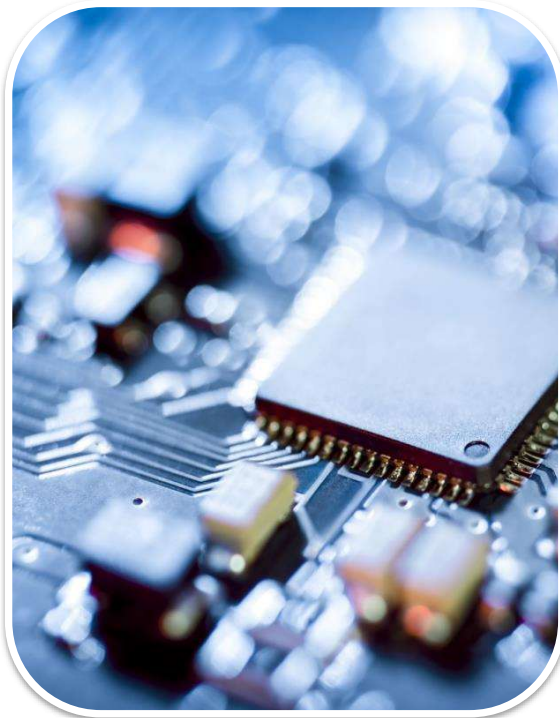


EARLY ON, GENERALIZED  
INTELLIGENCE LOOKED  
POSSIBLE



TURNT OUT TO BE HARDER  
THAN EXPECTED

# EARLY NEURAL NETWORKS



Inspired by biology

Created in the 1950's

Outclassed by Von  
Neumann Architecture

# EXPERT SYSTEMS



Highly complex



Programmed by hundreds of engineers



Rigorous programming of many rules

# EXPERT SYSTEMS - LIMITATIONS

What are these three images?



# HOW DO CHILDREN LEARN?



- Expose them to lots of data
- Give them the “correct answer”
- They will pick up the important patterns on their own

The background of the slide features a complex network graph. It consists of numerous small, semi-transparent nodes, some of which are white and others are a bright yellow. These nodes are interconnected by a dense web of thin, light-colored lines, creating a sense of connectivity and data flow. The overall aesthetic is high-tech and abstract, typical of visualizations used in artificial intelligence or data science presentations.

# THE DEEP LEARNING REVOLUTION



# DATA

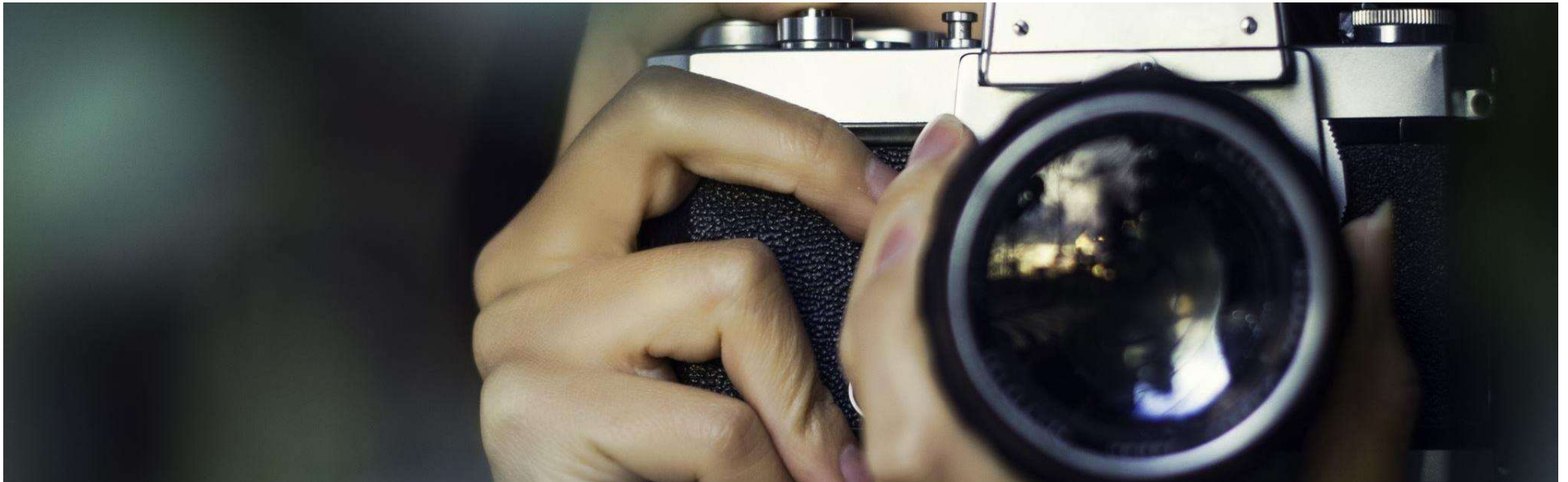
- Networks need a lot of information to learn from
- The digital era and the internet has supplied that data





# COMPUTING POWER

Need a way for our artificial “brain” to observe lots of data within a practical amount of time.

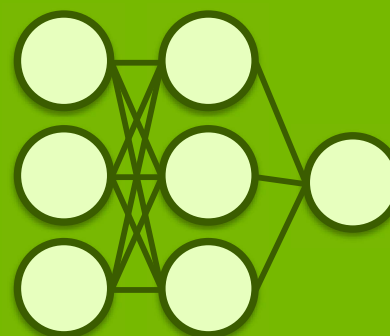


# THE IMPORTANCE OF THE GPU

A Rendered Image



A Neural Network





WHAT IS DEEP LEARNING?



# DEEP LEARNING FLIPS TRADITIONAL PROGRAMMING ON ITS HEAD

# TRADITIONAL PROGRAMMING

## Building a Classifier

1

Define a set of  
rules for  
classification

2

Program those  
rules into the  
computer

3

Feed it examples,  
and the program  
uses the rules to  
classify

# MACHINE LEARNING

## Building a Classifier

1

Show model the examples with the answer of how to classify

2

Model takes guesses, we tell it if it's right or not

3

Model learns to correctly categorize as it's training. The system learns the rules on its own



THIS IS A FUNDAMENTAL SHIFT



# WHEN TO CHOOSE DEEP LEARNING

Classic Programming

If rules are clear  
and  
straightforward,  
often better to just  
program it

Deep Learning

If rules are  
nuanced, complex,  
difficult to discern,  
use deep learning

# DEEP LEARNING COMPARED TO OTHER AI

Depth and complexity of networks

Up to billions of parameters (and growing)

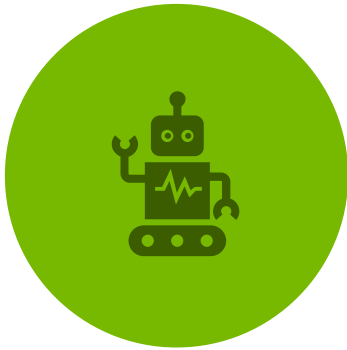
Many layers in a model

Important for learning complex rules

A complex network diagram is shown against a dark grey background. It consists of numerous small, semi-transparent nodes. Some nodes are white, while others are a bright yellow. These nodes are interconnected by a dense web of thin, light-grey lines, creating a complex, interconnected structure that resembles a neural network or a data graph. The lines vary in opacity, with some appearing more solid and others more faded, suggesting different strengths or types of connections. The overall effect is one of a dynamic, interconnected system.

# HOW DEEP LEARNING IS TRANSFORMING THE WORLD

# COMPUTER VISION



ROBOTICS AND  
MANUFACTURING



OBJECT  
DETECTION



SELF DRIVING  
CARS

# NATURAL LANGUAGE PROCESSING



REAL TIME  
TRANSLATION



VOICE  
RECOGNITION



VIRTUAL  
ASSISTANTS

# RECOMMENDER SYSTEMS



CONTENT  
CURATION



TARGETED  
ADVERTISING



SHOPPING  
RECOMMENDATIONS

# REINFORCEMENT LEARNING



ALPHAGO BEATS  
WORLD CHAMPION  
IN GO



AI BOTS BEAT  
PROFESSIONAL  
VIDEOGAMERS



STOCK TRADING  
ROBOTS