Artificial Intelligence
The Next Big Thing!

Jeff Bezos, CEO and Founder Amazon

"Artificial Intelligence and Machine Learning ...
will empower and improve **every business, every
government organization, every philanthropy** …

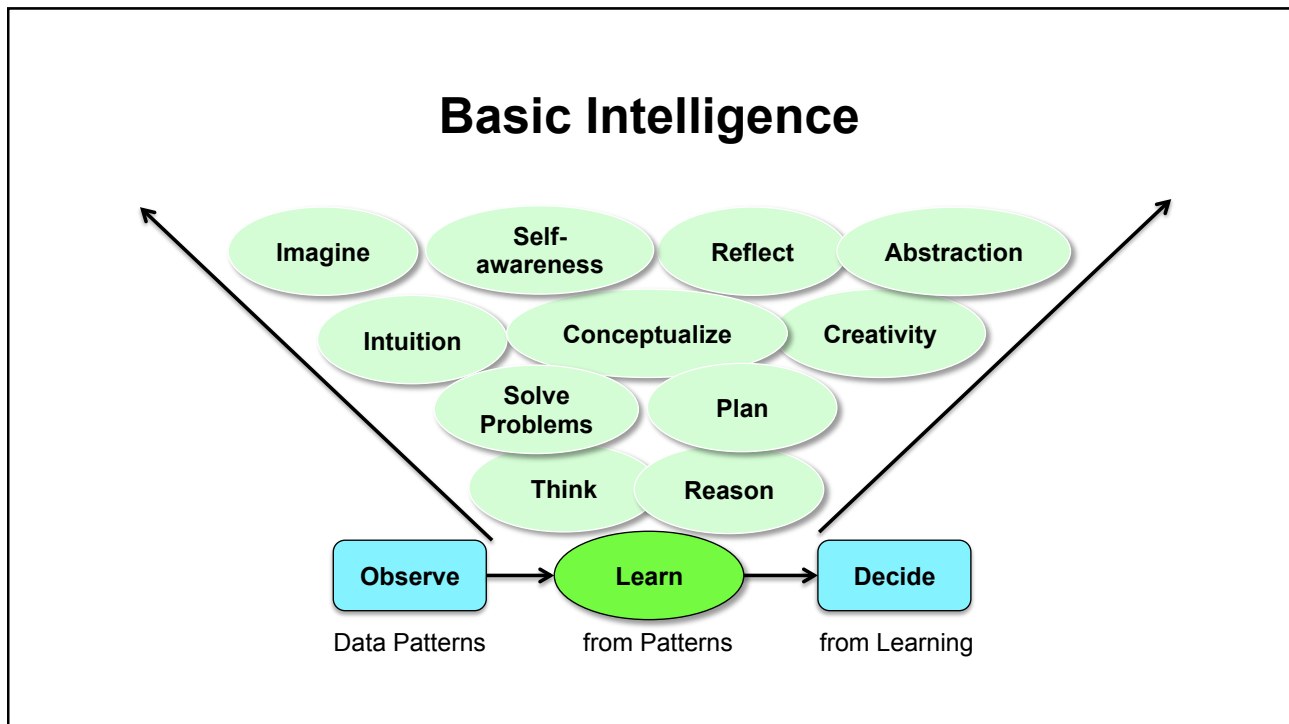… there is not an institution in the world that cannot be
improved with Machine Learning."

Stephen Hawking, Astrophysicist and Futurologist

"Success in creating AI could be the **biggest event in the history** of our civilization.

The genie is out of the bottle. We need to move forward on artificial intelligence development but we also need to be mindful of its **very real dangers**. **I fear that AI may replace humans altogether.**"

Artificial Intelligence

is the ability of machines

to mimic human intelligence

Basic Intelligence

Imagine   Self-awareness   Reflect   Abstraction

Intuition   Conceptualize   Creativity

Solve Problems   Plan

Think   Reason

Observe	Learn	Decide
Data Patterns	from Patterns	from Learning

Is There a Dog in the Picture?
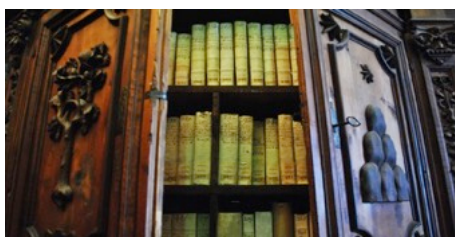

Source: Andreessen Horowitz

Original Picasso?

Source: Quartz/Artendex/Rutgers University/The Hague)

After analyzing 80,000 brushstrokes from 297 digitized sketches and drawings, an AI system was able to spot forged drawings in the style of Pablo Picasso, Henri Matisse, and Egon Schiele with 100% accuracy.

Artificial Intelligence Helping the Vatican

53 miles (85 km) of old books in Vatican covering 12 centuries

Inaccessible to scholars worldwide

Handwritten script cannot be machine read

AI used to predict the text as **data pattern**

What is this ➔
anmo, aimo, aiiio, aiino, amio ?

Source: theatlantic.com

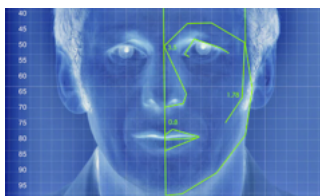# Artificial Intelligence Can Read Your Lips

University of Oxford's Department of Computer Science – **LipNet, GRID database**
- AI accuracy = **93.4%**, Human expert accuracy = **52.3%**

Oxford's Engineering Science and Google DeepMind – <u>**100,000 video clips from BBC TV**</u>
- AI accuracy = **46.8 %**, Human expert accuracy = **12.4%**
- Accuracy is lower, due to lighting, orientation, and greater language complexity
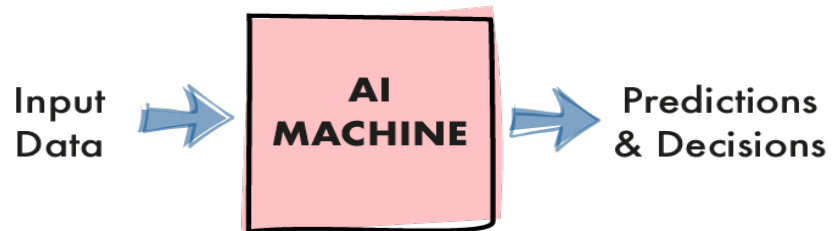
Our **Face** Says a Lot

- **Identity**
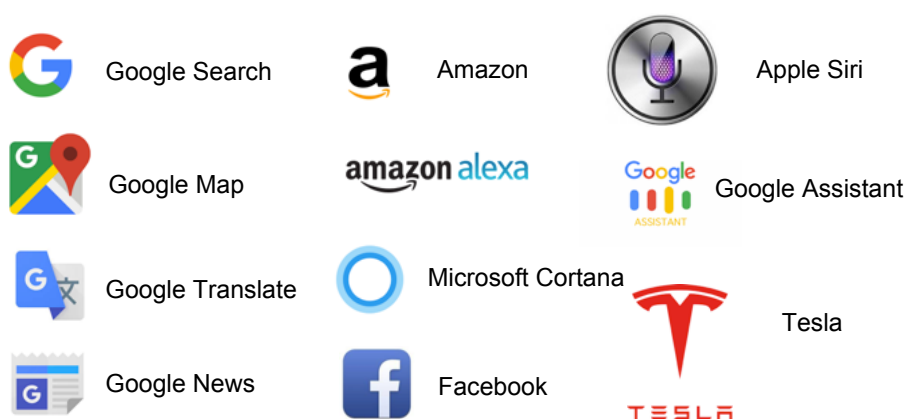- **Emotions**
- **Mood**
- **Health**
- **Orientation**
- **…**

Source: Guardian

Source: The Economist

AI **Automates** Decision Making

Input Data → AI MACHINE → Predictions & Decisions

Expert Decision-Making Becomes **Cheaper**

You are Already Using Artificial Intelligence

Google Search	Amazon	Apple Siri
Google Map	amazon alexa	Google Assistant
Google Translate	Microsoft Cortana	Tesla
Google News	Facebook	

More AI Applications …

Autonomous Vehicles
- Cars, buses, trucks
- Drones, Planes …
- Robots

Understanding the World
- Computer vision – 95%
- Object recognition
- Face recognition
- Automatic checkout
- Narratives from pictures
- Precision farming

Content Generation
- Articles, tweets, music, art
- Step by step recipes from video
- Photorealistic images – from sketches
- Movie trailers
- Application software from modules

Predictions
- Success of events
- Maintenance
- People personality
- Medical condition
- Diagnosis
- Recommendations
- Suicide intent
- Fraud

Optimizing
- Driving routes
- Football placement
- Software – 60%
- Energy consumption
- Stock market returns
- Income tax filings
- Spam

Language Understanding
- Speech recognition
- Lip reading
- Voice print
- Translations
- Autoreply to emails
- Understanding content
- Abstract generation
- Synopsis generation
- Job description match
- Legal document sorting

Behavior Understanding
- Customer intent
- Job interviews
- Political leanings

… growing every day

How Does a Machine Learn?

Learning Techniques

Assisted Learning
Supervised Learning

Self Learning
Unsupervised Learning

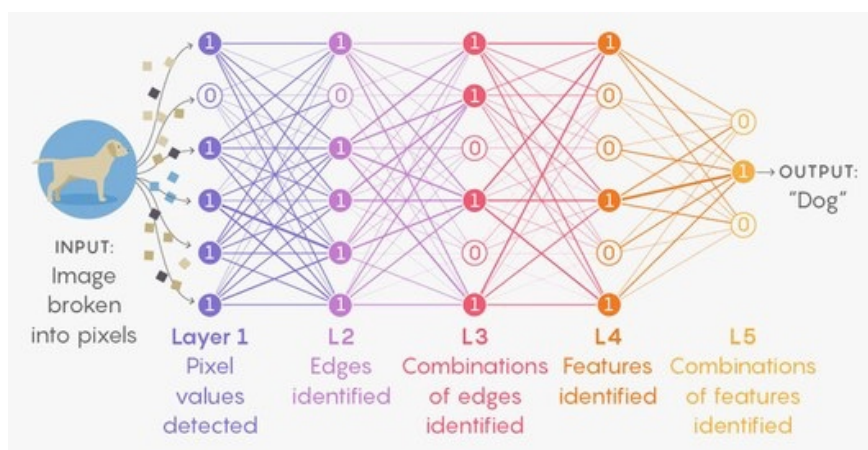# Alpha Zero "Destroys" Stockfish

Deep Mind's Alpha Zero **learnt Chess in 4 hours**
"**Stockfish**" is the highest rated Chess Computer

Our Brain – A Network of Neurons
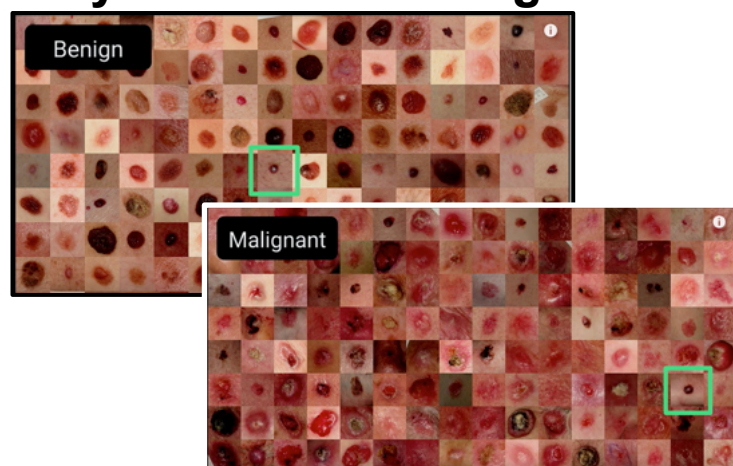

Deep Learning Neural Network

LUCY READING-IKKANDA/QUANTA MAGAZINE, https://www.wired.com/story/new-theory-deep-learning

Translating AI into Business

Business is all about
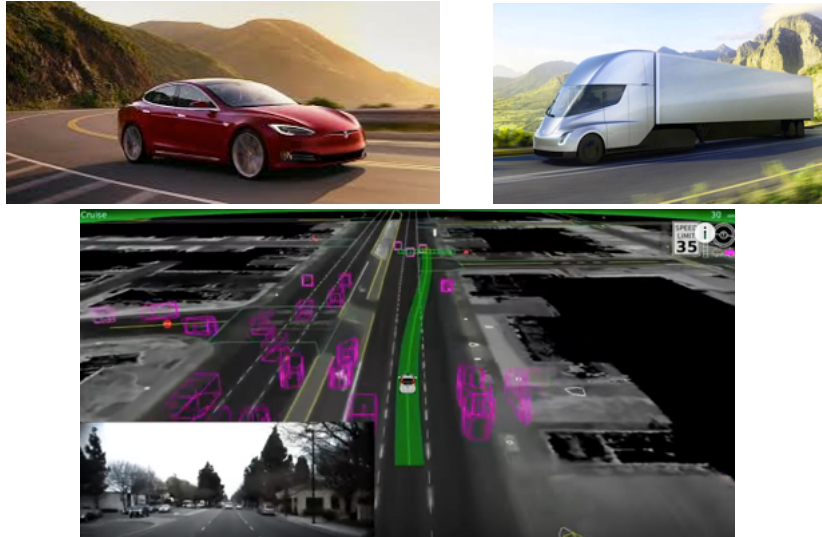
Predictive **Decision-Making**

Stanford University Skin **Cancer** Diagnosis

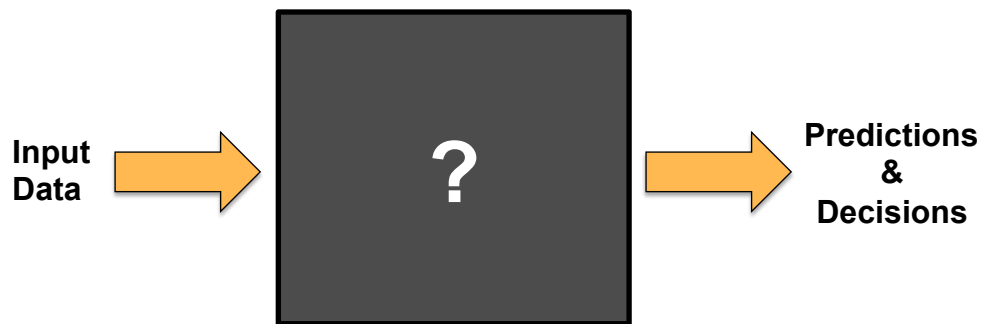Source: Skin Cancer Image Classification (TensorFlow Dev Summit 2017)

AI outperformed expert dermatologists in diagnosis accuracy
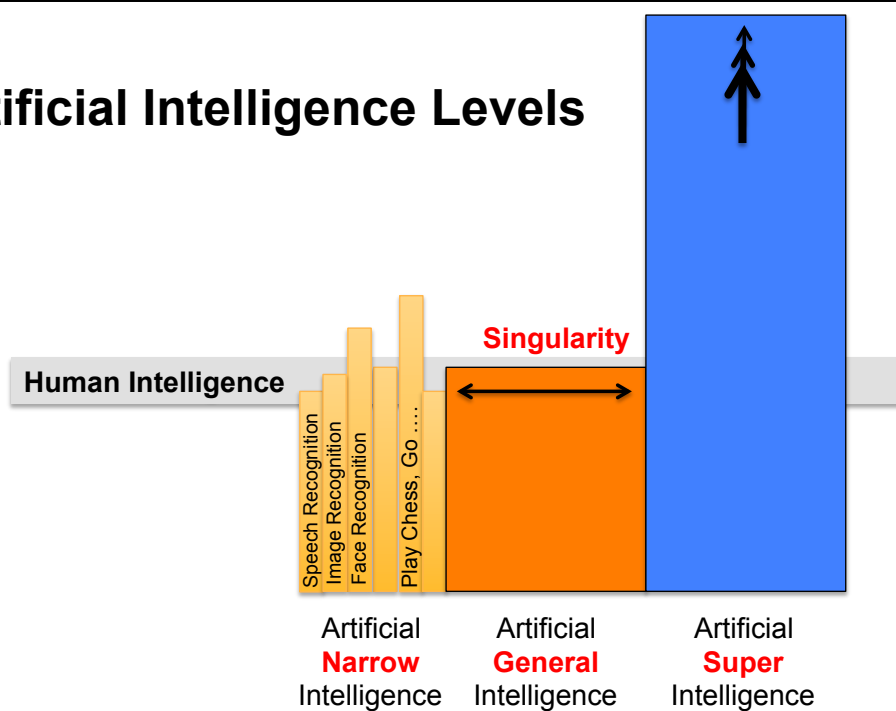
Tesla – **Autonomous** Vehicles

Data is the fuel of **AI**

AI System = Expert in a Black Box

Input Data → **?** → **Predictions & Decisions**

Transparency ? Rationale ?

Artificial Intelligence Levels

Singularity

Human Intelligence

Speech Recognition
Image Recognition
Face Recognition
Play Chess, Go ....

Artificial **Narrow** Intelligence

Artificial **General** Intelligence

Artificial **Super** Intelligence

Thanks

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https://www.amazon.com/AI-Translating-Artificial-Intelligence-Business/dp/1521717206/
http://www.ai-u.org/