1. How do digital data work? How do you digitize data?
2. Most data is unstructured.
3. Difference between structured and unstructured data.
4. Data in tables with relations: databases.
5. Data revolution.
6. Collecting data: with and without human intervention
7. Processing data: algorithms
8. Machine learning: automatic learning from data. Automate "head labor".
9. Machine learning algorithms and learning techniques.
10. Computers, machine learning and language.
11. Practical examples: TF-IDF, RECOMMENDATION ENGINES
12. Computers, machine learning and image recognition
13. Problems with AI: AI and bias

We analyze data to learn from it,
to make better decisions,
to influence the decisions of others.

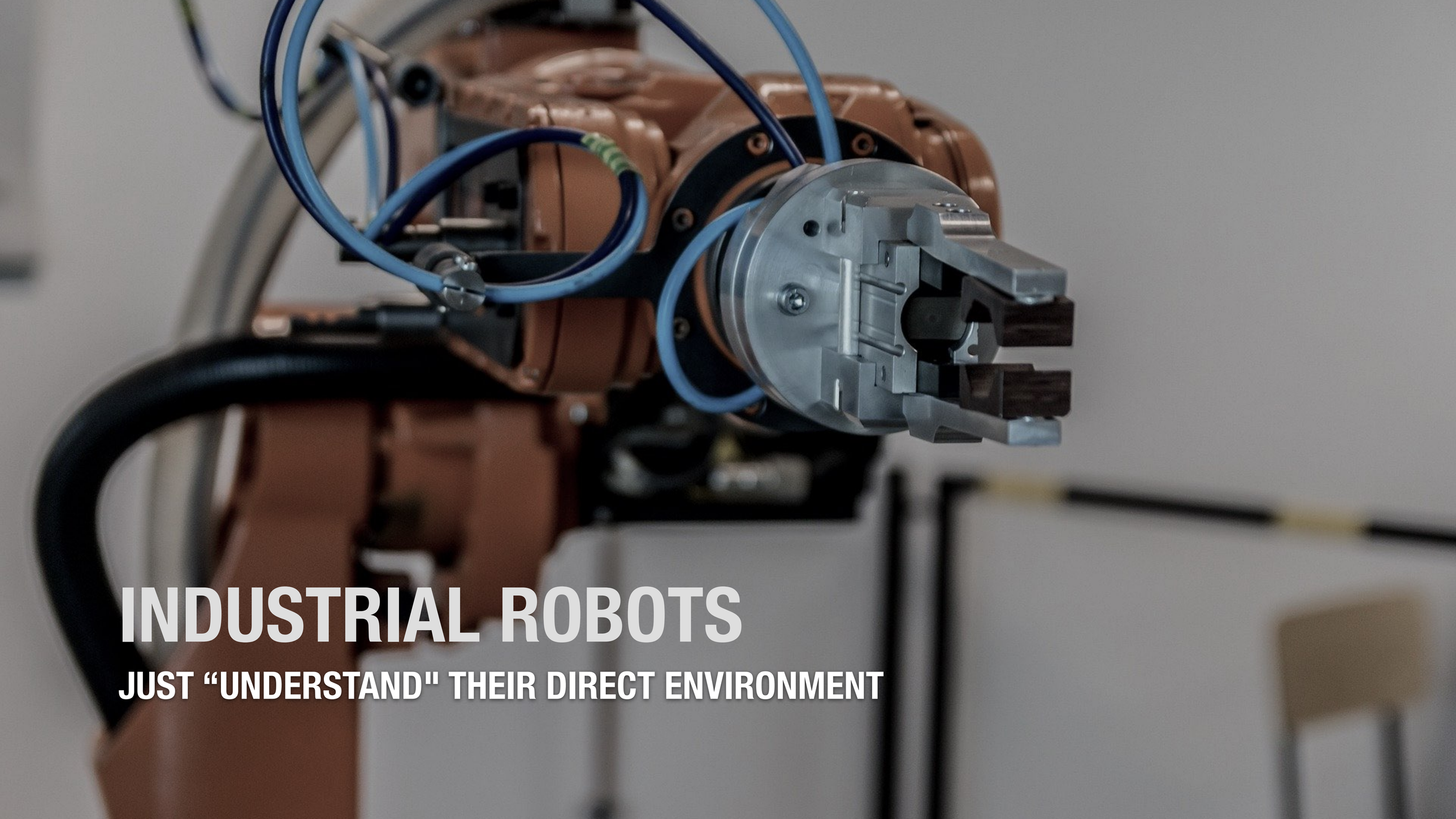

HUMAN LEARNING
MACHINE LEARNING

Machine learning: automatic learning from data.
Automate "head labor".



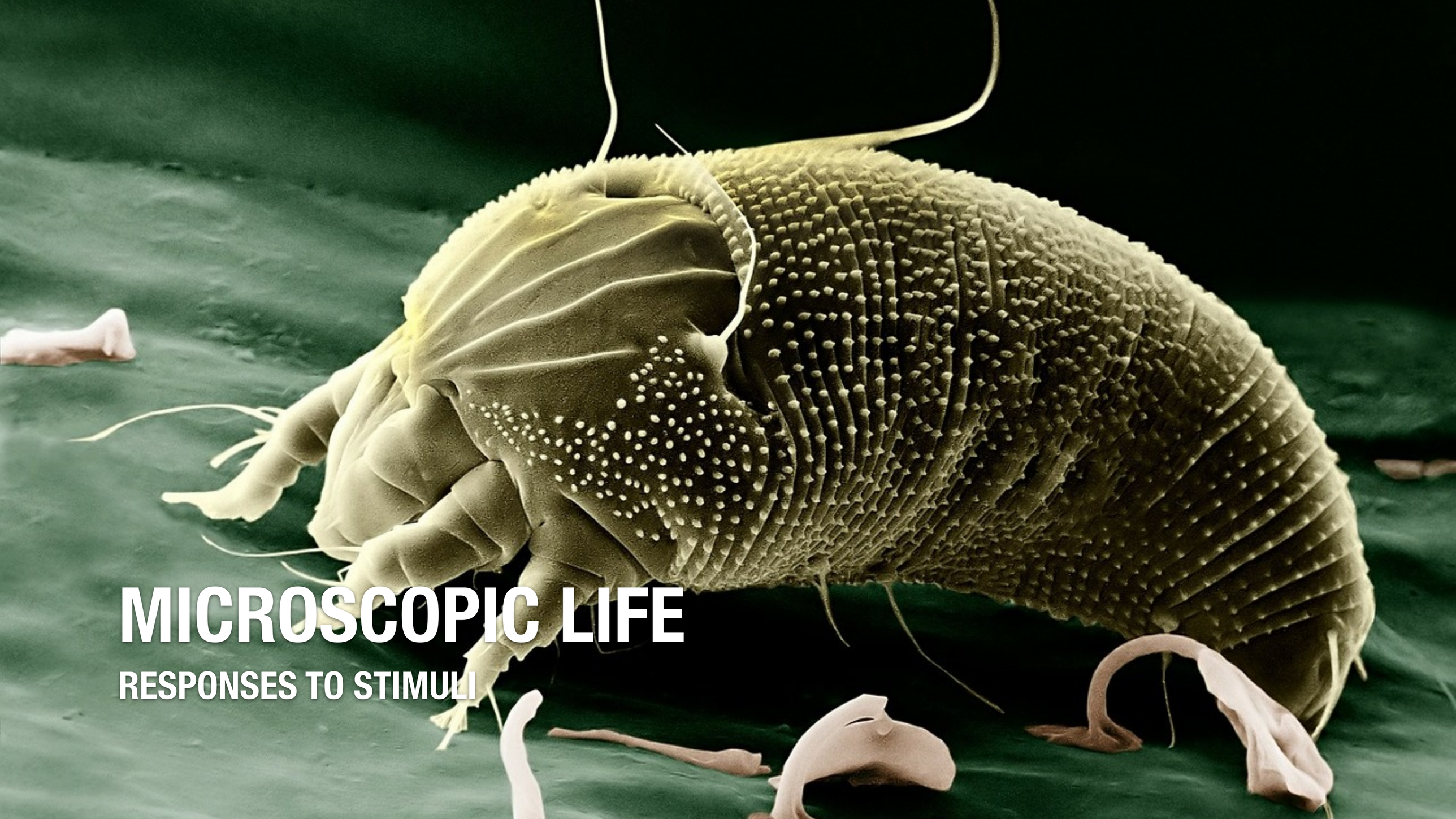
PERCEPTION

OBSERVING & INTERPRETING THE ENVIRONMENT



INDUSTRIAL ROBOTS

JUST “UNDERSTAND" THEIR DIRECT ENVIRONMENT



MICROSCOPIC LIFE

RESPONSES TO STIMULI



ROBOT VACUUM CLEANER SEEMS “INTELLIGENT”

RESPONDS WITHOUT SEEING AND WITHOUT NEURONS



SELF-DRIVING CAR

RECOGNIZING THE ENVIRONMENT + ADJUSTING DRIVING BEHAVIOR



PERCEPTION

RECOGNIZE + TUNE BEHAVIOR TO PERCEPTION

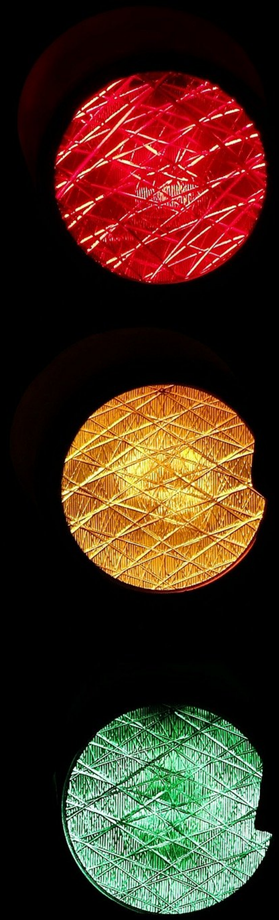
PERCEPTION

RECOGNITION

PREDICTION

CHANGE BEHAVIOR

recognizing
traffic lights does
not require
extensive
"intelligence"

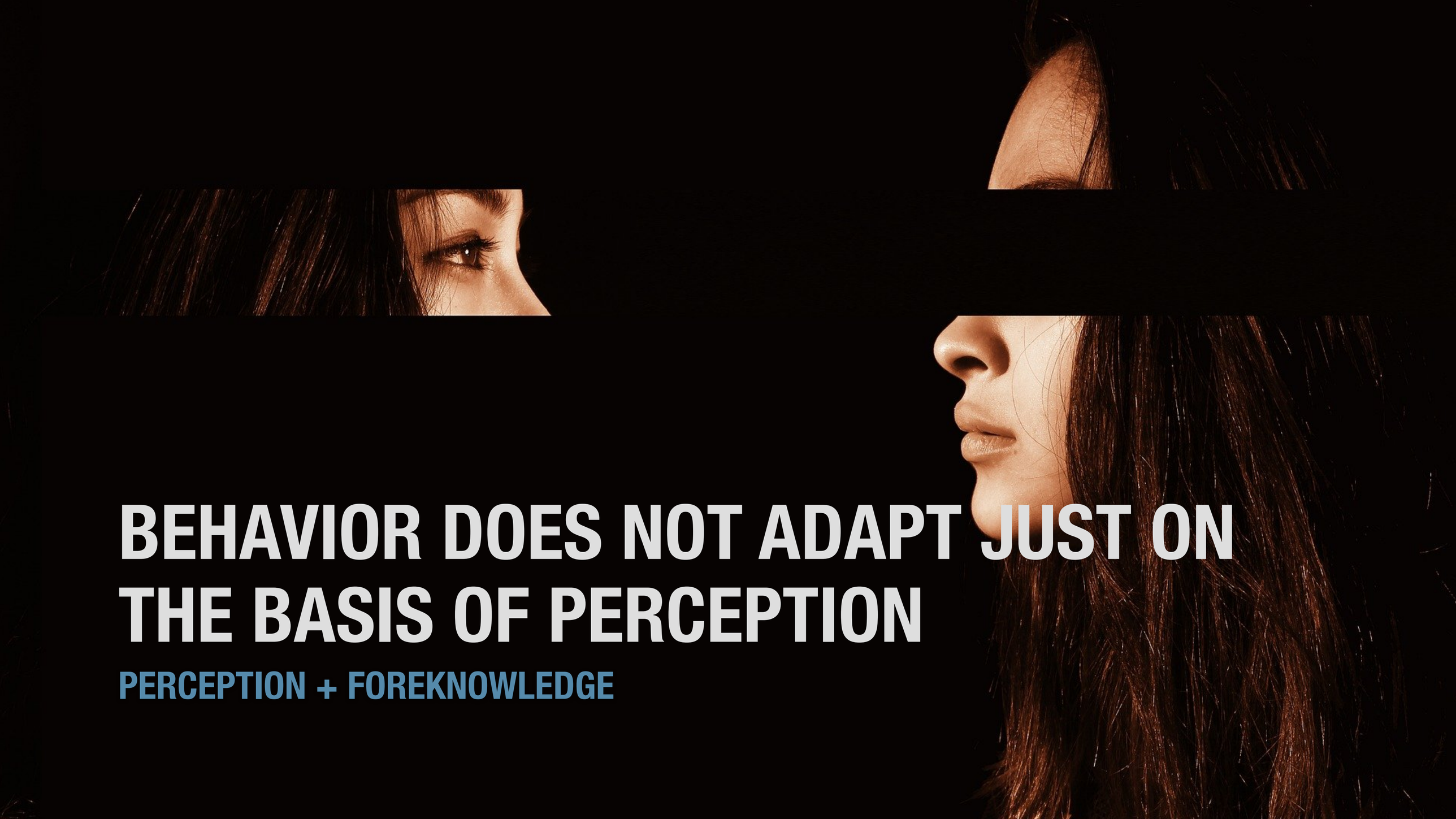




Recommendations do not mean that the software knows you as well as your partner

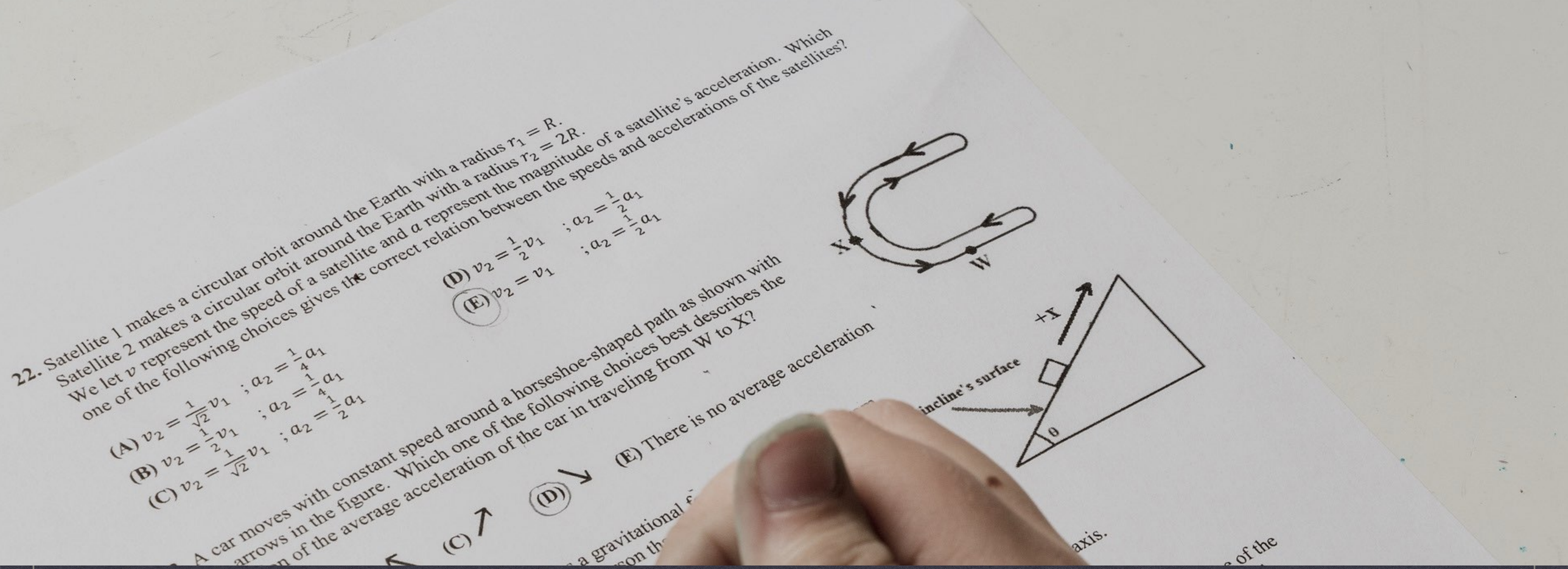


Machines are able to recognize feelings and respond appropriately,
but this does not mean they understand feelings or that they are empathic.



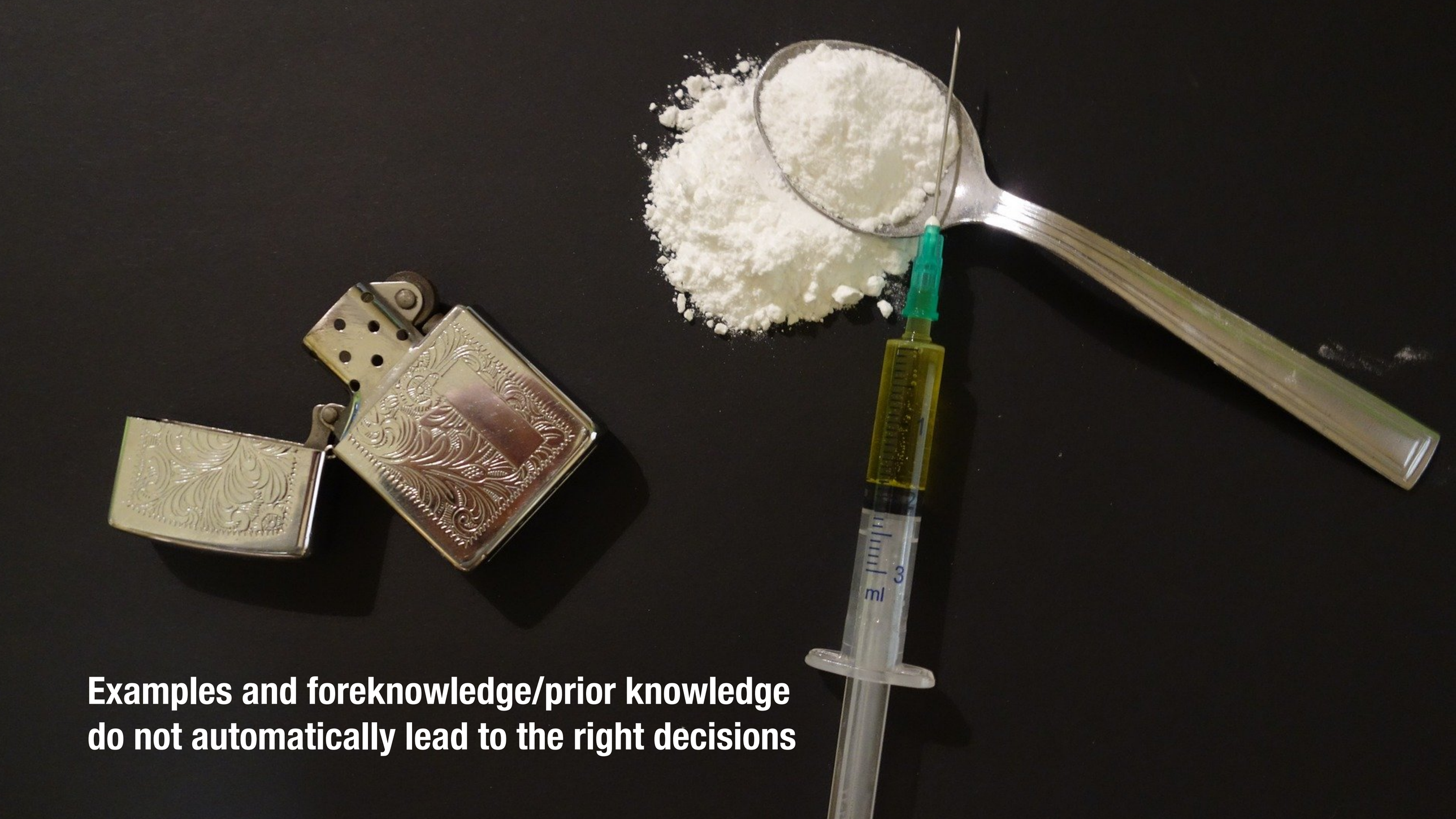
BEHAVIOR DOES NOT ADAPT JUST ON THE BASIS OF PERCEPTION

PERCEPTION + FOREKNOWLEDGE



‘FOREKNOWLEDGE’ + LEARNED BEHAVIOR

OWN "EXPERIENCES", SCHOOL KNOWLEDGE, EXAMPLES OF OTHERS ...



Examples and foreknowledge/prior knowledge do not automatically lead to the right decisions





EXTERNAL INFLUENCES

PERCEPTION

CONNECT RECOGNITION TO ‘FOREKNOWLEDGE’

PREDICTION

CHANGE BEHAVIOR

How to create “machine learning”?

EXAMPLE DATA (DATASET)

SUPERVISED LEARNING

NEW DATA

PREDICTION

CHANGE BEHAVIOR

FOREKNOWLEDGE + REMEMBER FEEDBACK

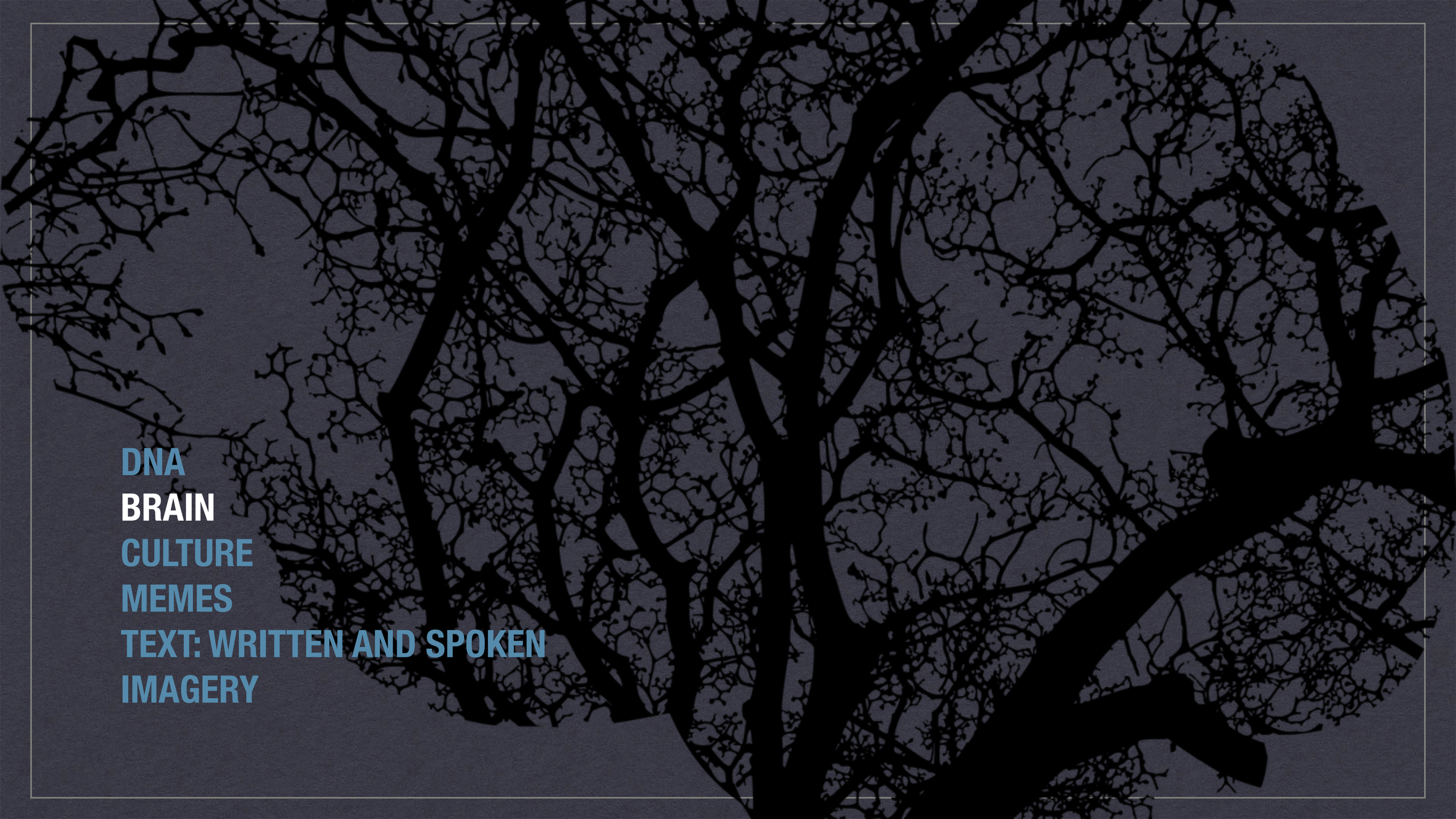


RETAINING EXPERIENCES AND KNOWLEDGE

DATA STORAGE




DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY


DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY


DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY



DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY

DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY





DNA
BRAIN
CULTURE
MEMES
TEXT: WRITTEN AND SPOKEN
IMAGERY



ANALOG SYSTEMS

STORAGE MEDIA

DIGITAL SYSTEMS

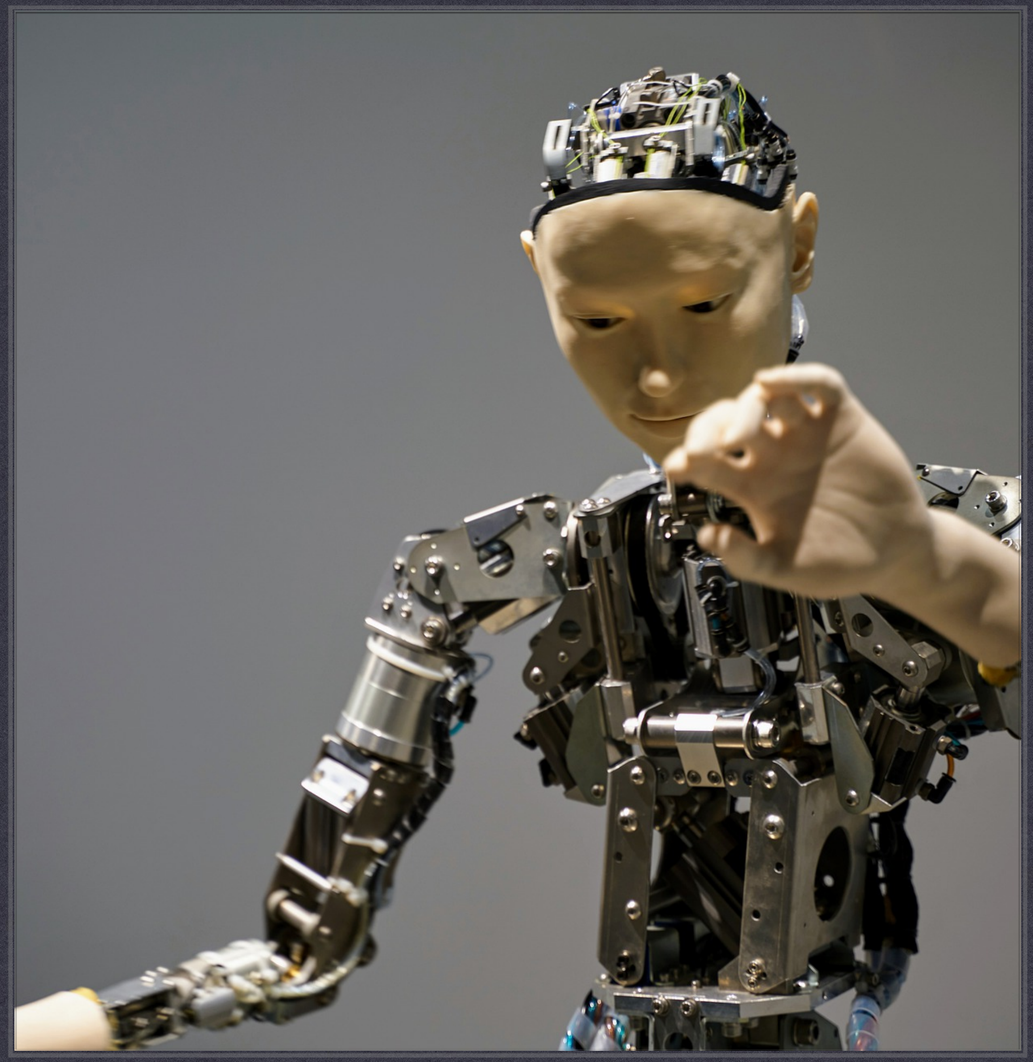
STORAGE MEDIA




SONY
MEMORY STICK DUO
MAGICGATE
32MB
0630784
6600
SanDisk
Card
Lock
32MB
MultiMediaCard
PC-Card GmbH
128 MB
SanDisk
MEMORY STICK PRO DUO
1.0GB MAGICGATE
SAMSUNG
MMC
PLUS
SUNG TECHWIN CO., LTD.
6MB

HUGE CHALLENGE

NOT ONLY STORING DATA
LEARN TO UNDERSTAND DATA AS WELL



COMPUTER VISION + IMAGE RECOGNITION

UNDERSTANDING THE ENVIRONMENT



NATURAL LANGUAGE PROCESSING + GENERATION

COMMUNICATION WITH PEOPLE



HOW TO GET STARTED?

WHAT IS THIS ABOUT?
HOW CAN YOU TEACH A MACHINE TO (TRY TO) UNDERSTAND THIS DATA?



ALGORITHM?

THINK OF A STEP-BY-STEP PLAN.
HOW DO YOU TACKLE THIS "PROBLEM"?
THE INTENTION IS THAT YOU TRY TO UNDERSTAND THE "CONTENT".

