

1. Write half page discussing how A.I. relates to other disciplines mentioned in the chapter.

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Artificial Intelligence is focused on understanding and building entities. It can be applied to a large number of fields and specific applications.

The first useful approaches that allow us to start understanding the way that our intelligence works were the Philosophy, specifically with Aristotle (Ancient Greece) that was the case with the idea of formal laws that described the process to use premises in order to get a conclusion. In this area also more abstract concept was founded, such the duality, materialism, empiricism that allows developing a more conscious approach about what means to be a human.

Another fundamental area for the development of Artificial Intelligence, and was derived from the Philosophy was the Mathematics, specifically logic (the application of the foundations that Aristotle left), the computability and the strength of algorithms and finally, the probability of an event to happen and the implications it has.

Economics had also an important impact for the foundation of the Artificial Intelligence principles, keeping in mind the principle of utility and capital described for Adam Smith, which ideas are fundamental to perceive the concept of utility based on events and decisions to achieve something (Decision Theory - Game Theory).

The Neuroscience is focused on the way that a human's cognitive process in a physiological way: the composition of the brain, the nervous system, the mechanical, electric and chemical changes that occur on our head, using non-invasive technologies

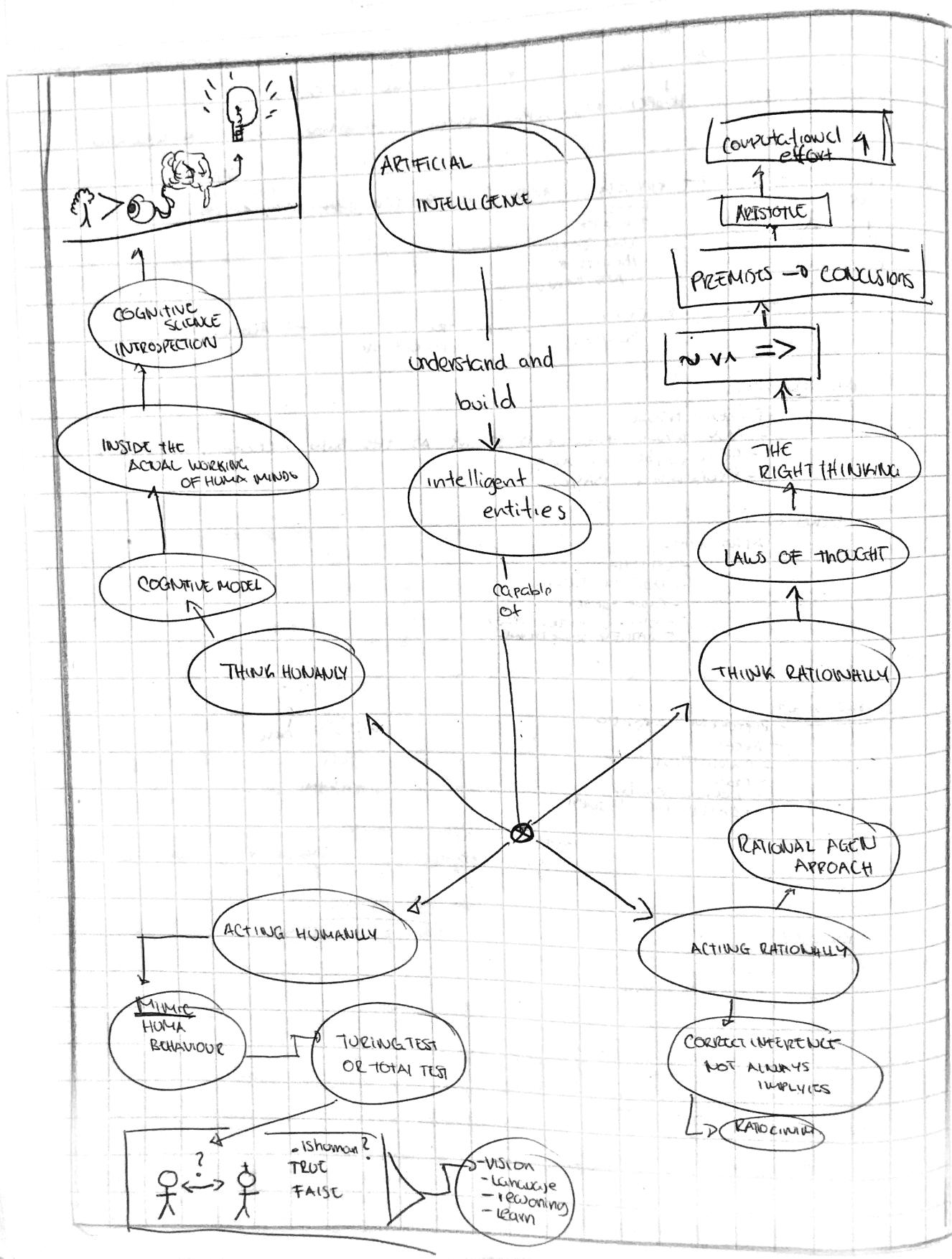
Cognitive psychology, which views the brain as an information-processing device, that also set the bases for a knowledge-based agent: the stimulus must be translated into an internal representation, the representation is manipulated by cognitive processes to derive new internal representations, and these are in turn translated back into action.

Computer Engineering, on the other hand, is looking for the software and hardware capable of mimic the human capabilities.

With the Control we are able to operate dynamical systems in engineered processes and machines. The objective is to develop a control model for controlling such systems using a control action in an optimum manner without delay or overshoot and ensuring control stability.

Linguistics: The science behind the natural language processing, fundamental for a more natural interaction with the machine, it relies on the semantics and syntax of the language and its implications.

As it was mentioned in the beginning, these sciences are foundations but the applications can be found everywhere, from driving and gaming to cybersecurity to Medicine.



What is artificial general intelligence (or Strong AI)? Do you think this is achievable? (Watch the video above for the necessary background).

A Strong IA, is an entity that is indistinguishable from human intelligence, this first idea comes from The Turing Test, then the Total Turing test a, the main idea of them is to develop an agent capable of fool a human, making him appear as another human.

Keeping in mind this, I think that passing the Turing Test and its total version is totally possible, but then the implications that suggest the Chinese Room Argument must take in considerations if it really a strong AI, also the definition of "being human" must be evaluated

# Notes 1 Introduction

US → HomoSapiens → man the wise → because of



our intelligence



After WWII  
Named until  
1956

Artificial intelligence

- build  
- understand

ENTITIES

universal  
- field  
- AND APPLICATIONS

GENERAL → SPECIFIC

What is AI

THOUGHT  
PROCESSES AND  
BEHAVIOR

THINK HUMANLY

②

THINK RATIONALLY

③

ADDRESS  
BEHAVIOR

ACTING HUMANLY

①

ACTING RATIONALLY

④

MEASURING SUCCESS IN TERMS  
OF FIDELITY TO  
HUMAN PERFORMANCE

~~TECHNIQUE~~

HUMAN  
BEHAVIOR

IDEA PERFORMANCE  
called RATIONALITY

MATH

## ACTING HUMANLY

→ TURING TEST APPROACH

→ AN HUMAN INTERLOCATOR ASKS A COMPUTER AND CANNOT DEFINE IF WAS A HUMAN OR A COMP.

→ A COMPUTER MUST HAVE THE FOLLOWING CAPABILITIES

A

- PROCESS NATURAL LANGUAGE → ABLE TO COMMUNICATE.
- KNOWLEDGE REPRESENTATION → STORE WHAT HEARS
- AUTOMATED REASONING → USE STRATEGY TO ANSWER AND CONCLUDE
- MACHINE LEARNING → TO ADAPT TO NEW CIRCUMSTANCES

TO PASS THE TOTAL TURING TEST → + COMPUTER VISION: TO PERCEIVE

+ ROBOTICS

J

IMPLIES  
A PHYSICAL  
INTERACTION  
WITH A HUMAN.

- IT IS NECESSARY TO KEEP STUDYING THE UNDERLYING PRINCIPLES OF THE INTELLIGENT

## THINKING HUMANLY

COGNITIVE MODELING APPROACH

- WE NEED TO GET INSIDE OF THE ACTUAL WORKINGS OF HUMAN MINDS
  - COGNITIVE SCIENCE IS NECESSARY TO MAP THE APPROACH IT HAS, AND GENERATE THE MODEL.
  - GRS CREATORS WERE LOOKING FOR THE STEPS.
- ↳ GENERAL PROGRAM SOLVER.

## THINKING RATIONALLY

THE LAW OF THOUGHT APPROACH

- ARISTOTELIC → RIGHT THINKING → PATTERNS AND STRUCTURES → SYLOGISMOS → LOGIC.
- LOGIC SOLVES ANY PROBLEM BUT IT SHOULD TAKE A LOT OF WORK TO TRANSFORM TO A FORMAL STATEMENT'S STRUCTURE
- LOOPING ERRORS.

## ACTIVE RATIONALITY

- PLATONIAN AGENT APPROACH
- AN AGENT IS SOMETHING THAT ACTS (+ DO).
- RATIONAL AGENT: ACT TO ACHIEVE THE BEST POSSIBLE OUTCOME.
- HAS TO DO SOMETHING, EVEN IF IT DOES NOT EXIST

LAW OF THOUGHT AS ALREADY METHOD TO APPLY OR REACT.

- COMPUTATIONAL METHODS ARE USED

- LIMITED RATIONALITY

- COMPUTING POWER.

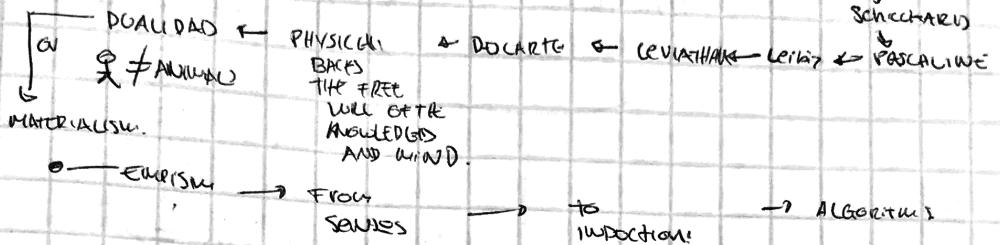
## FOUNDATIONS OF IA

### - Philosophy:

Aristotle. Laws equivalent to the rational part of the world  
 PREMISES → CONCLUSION

RAMON LULL: APICO TO MECHANICAL ARTIFACTS.

HOBES: NUMERICAL COMPUTATION → DA VINCI: MECHANICAL CALCULATOR



## MATHEMATICS

### - BOOLEAN APPROACH

- ANY TURING THEORY IS STRONG AS THE BASIS → Gödel, incompleteness
- NP Computable or not
- Probability (Bayes)

## ECONOMICS

### ADAM SMITH

- UTILITY
- DESIGN THEORY
- GAME THEORY
- MARKET POSITION PROCES.
- SATISFY SOCIETY/ONE

## Neuroscience

- DIFFERENT CONNECTIONS
- AREAS
- COORDINATION
- Gödel
- Neuron, Structure
- RAIKOVSKY Models



selective encodology.

→ moderate recruitment

→ moderate recruitment, parallel

## COMPUTER SCIENCE

Handling raw information.

## Psychology

- BEHAVIOR
- COGNITIVE APPROACH

## LINGUISTICS

- PRODUCTION vs STRUCTURE

## CONTROL

- HOMEOSTASIS
- COORD
- OBJECTIVE AND IMPULS

DAT → ROB → DRAW → SPEECH