

Codes and The Language of The Brain

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Preliminary Remarks

- The memory mechanism may use a technology different from that of a CPU (“active organs”)
- Processes in the nervous system may change their character from digital to analog, and back to digital, repeatedly
- The genes belong to the “digital” part of the system, yet they trigger “analog” chemical processes

Codes

- A system of logical instructions that an “automaton” can carry out and which causes the “automaton” to perform some organized task is called a *code*. More generally: Anything that induces a system to function in a reproducible, purposive manner.
- A *complete code* defines completely a specific behavior of the system
- Systems of instructions which make one machine imitate the behavior of another are known as *short codes* (Turing, 1937).

Arithmetic vs. Logic in The Brain

- Must the nervous system have an arithmetical as well as a logical part?
- If so, what's the precision of the arithmetical part?
- Intensities are translated into frequencies in the brain; the message system is of statistical character
- The nervous system manages to do its work on a rather low level of precision, but the level of reliability is high
- “Certain (statistical) relationships between such trains of pulses should also transmit information”

The Language of The Brain

- The language of the brain is not the language of mathematics
- The language of mathematics and the natural languages are secondary languages (“short codes”) built on top of the primary nervous system language
- The primary language differs considerably from that of mathematics