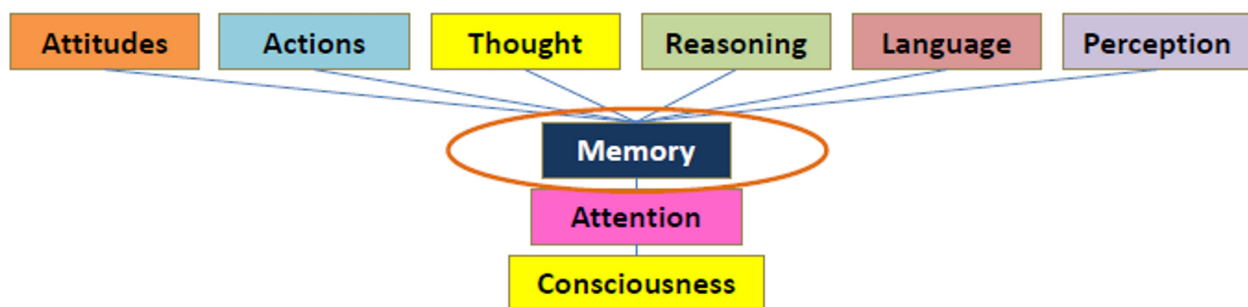


# Unit 01 L11 Introduction

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- Cognitive Science is a scientific interdisciplinary study of the mind
- 认知科学是对心灵的跨学科科学研究
  - "An effort to study and produce scientific explanations about how our mind works"
  - 研究并给出心灵工作方式的科学解释
  - What is a scientific study? 什么是科学研究?
  - Who study the mind? 谁来研究心灵?
  - What do we need to know? 我们需要知道什么?
  - How do we study the mind? 我们如何研究心灵?
  - What is "mind"? 心灵是什么?
- 什么是认知(Cognition):
  - The act or process of knowing; perception
  - The product of such a process; something thus known, perceived, etc.
  - Knowledge
- 认知和计算(Cognition and Computation)
  - 一般认为, 人的大脑经过了某种计算, 从而产生了明智的行为和意识
  - 这些计算可能是:
    - 数学运算
    - 逻辑判断
    - 模式匹配
    - 不断的满足一个目标
- 意识的运作模式:



- 认知科学的正统定义
  - 知科学, 是一门研究讯息如何在脑中形成以及转录过程的跨领域学科。它研究何为认知, 认知有何用途以及它如何工作, 研究信息如何表现为感觉、语言、注意、推理和情感。其研究领域包括心理学、哲学、人工智能、神经科学、学习、语言学、人类学、社会学和教育学。
  - An interdisciplinary study that attempts to explain how mind and

thinking works to produce intelligence by:

- Combining theories from Philosophy, Psychology, Neuroscience, Linguistics, Anthropology and Artificial Intelligence to explain how mind and thinking works.
- Forming new hypotheses and designing experiments and computational models to validate the hypotheses.
- Applying the knowledge in areas such as:
  - Robotics
  - Education
  - Decision Support
  - Health and mental illness
- Cognition and Intelligence 认知和智能
  - Perception collects and interprets data in the form that the mind can understand
    - How do we receive the information?
  - Cognition links interpreted information to existing knowledge, updates it or creates new knowledge.
    - Processing the information
  - Only knowledge cannot make us intelligent. The ability to link and apply knowledge effectively makes us intelligent.
    - Linking the information.
- Perception 知觉
  - Sensory receptors (input)
  - Meaning and knowledge of the world
  - Mental processes
  - Coordination among mental processes
  - Output
- Perception: Related Processes
  - **Focus(集中注意力)**: So much info around us.
  - **Perception and attention(直觉和注意力)**: selects the locations at which your eyes fixate, but almost all the time this is accomplished **without direct conscious control(有意识地控制)**
    - What do we attend to?
  - However, with effort to **remember** what to focus on, it can be brought under **conscious control**.
- Chatbots and Machine Intelligence 聊天机器人和机器智能
  - Computer programs such as Chatbots are written to simulate how human converse with others.
  - Conversation and use of language is a sign of human intelligence.
  - Alan Turing first came up with the idea of *Turing test* (图灵测试) to define machine intelligence
- What's a "Process" 什么是程序?
  - Alan Turing, a British mathematician, logician, cryptanalyst, philosopher, and computer scientist - *the father of theoretical computer science and artificial intelligence* 阿伦·图灵, 现代计算机科学与人工智能之父
  - Provided a formalisation of a "Process" in terms of concepts of "algorithm" and "computation" with *Turing machine* 图灵机.