cog sci lecture 1

#yale/coursework/sophomore/CGSCI 110#

Good, coherent lecturer, snappy slides, lots of shock factor. Worked on genetics, AI, Perception and Cognition Lab,
http://perception.yale.edu/IntroCogSci
humans are strange and fascinating

Slides

1-CogSci-IntroToYourMind.pdf
Sep 1, 2017

Cog sci is the study of how the mind works

- perception, memory, language, decisions, emotions, consciousness, reasoning, imagery, attention, categorization, morality etc

Burning questions:

how do we recognize faces?

- this is due to a lot of cognitive processing
- using AI, we are able to replicate faces and recognize them, using principles from human cognition
  - we can also recognize emotion on faces such as trust, competence, anger
  - some faces look more competent, trustworthy than others
- facial recognition for competence done by humans is done in 1 second. And the judgements formed can sway election results enormously

What makes a sentence grammatical?

- we don't really have to think about it, its intuitive. We usually do not memorize the rules for grammar and syntax
- We can only feel the outcomes of the rules: sentences that you hear as "weird" or "dissonant"

how do we understand words from patterns of sound?

- again, we have no control of this

what makes humans so special?

- we will talk about AI, humans, ants
- there is an ant that can wander to forage for food, but keeps an updated representation of its home, so it can go back in a straight line. So even the ant has a mind that is a computer

why do companies offer cash discounts rather than credit card surcharges?

- framing the same problem differently impacts our decision making

two kinds of thinking: fast and slow

- e.g. sq root of 169
- e.g. how many windows in 2nd floor of house?
- both questions are factual, but one is faster than the other.
- the second question involved mental imagery.

what do we see?

- do we see the same as others?
- our minds work counterintuitively: what we see is whatever we are tending to, if we are not tending to something, we are blind to it
- in the game we played, the railing in the picture kept moving and it was so obvious, but we were blind to it because we weren't tending to it
- what we see is not whats in front of us, sometimes even when we tend to it

how do nature and nurture interact to determine…

- our personalities, our smartness, political persuasions?
- a study looked at how much monozygotic and dizygotic twins are similar to each other: early on, both types are similar, until about 19 years when fraternal twins become more different due to the fact that they share less genetic material.
- even things like political stance, or attitudes are rooted in genetics
- Intelligence/IQ: is it genetics or environment? Mostly genetics

what do MRIs mean?

- we go down all the way to the level of the proton
- we look at neuroscience to see the biological basis of who we are

what is right and what is wrong, and how do we know?

- what is the cognitive science of morality
- this is no longer a philosophical question, what is the neuroscientific basis for right and wrong?

how did our minds evolve?

- computational modeling is changing the way we think about evolution. We can now simulate evolution many times, a billion times faster, so you can see how things evolved and how likely they are to evolve
- the famous evolution question: the evolution of the eye is a testing ground for religious ideas (the eye is so complicated, how could it have evolved through blind chance?). Now when people ask about the eye, we can simulate such an evolution. We can see how likely it is for the eye to evolve.

how has evolution affected social interactions e.g. attractiveness?

- things like the limbal ring around the iris is a subtle cue to age

For all of these questions:

1. What are the representations and processes in our minds?
2. How are they acquired?
3. How are they implemented in tissue?

This course is more about theory, not about application. So stuff like attention, recognition, memory AND NOT advertising, imaging satellites/computers, eye-witness testimonies in court etc

CogSci is interdisciplinary:

- computer, psychology, neuroscience, behavorial economics, linguistics, philosophy, anthropology

Bread vs Depth

- First third of course will be about themes e.g. modularity, computation, nature and nurture
- Then we will do case studies on five or six aspects of our minds

Lecture vs Discussion

- no sections in this course
- will be impersonal and not much discussion, so ask the prof questions and raise hand, or after class

Readings

- lectures and readings will overlap only slightly, the readings will be different. The readings

are background for the lectures.

No textbook for this course

- you will have to read scientific papers, excerpts, newspapers, popular books
- the goal is not to understand everything but the general theme/idea

evaluations

- the readings responses are free
- easy but you got to keep up