21.9

Tutorial

Alan Newell: Darthmouth Conference- Birth of A.I. Check Wikipedia

Online Test every Friday (myAberdeen), due the next Friday, worth 25% of grade, final test 75%

This Friday release: Turing Paper (for the Friday test)

Computing machinery & Intelligence

For next Monday bring the best example of AI (tongue vision thing)

“Singularity is going to happen in <100 years” – Choose a side!

25.9.2015

What competence do you need for robots?

Vision-

* For recognition
* For action

Touch or other modalities

Motor skills

Transfer

Motivation

Learning

Concepts and representation

* Image processing algorithms have trouble with segmentation, identifying parts of known objects such as cars, buildings etc.
* Gestalts: unclear how to group understands and how to weigh different Gestalt principles
* Stable object class recognition
* Small parts and objects: difficult to perceive and difficult to find reliably

“It may be many years before computers can name and outline all of the objects in a photograph with the same skill as a two-year-old child.”

1. Grasping – Krueger, Kragic, Vincze, Saxena
2. Single object affordances – Ugur, Stotchev
3. Pairs of objects - Fichtl, Rosman&Ramamoorthy

Touch or other modalities: vibrotactile, audio, pressure sensor, Skin

Multiple views

* Gives information about 3D distance
* Two cameras(or more)
* Moving camera (moving and zooming, structure of motion problem)
* Can extract the shape of scene, position for cameras
* MS Kinect

Tutorial Monday 28.9

Best example of A.I.

“Singularity is going to happen in <100 years” – Choose a side!

Singularity is not going to happen because of the advanced nature of neurons in the brain. The CNS is unparalleled in it’s complexity and ability to adapt and think by itself.

Today computers have a hard time actually understanding the data they hold. They cannot process it further than their code gives them leverage.

For computers to become self aware they would need a consciousness

Humans have not found the consciousness from the brain yet

Will exponential growth stop at some point?

Does sheer increase in computing power actually help achieve computational intelligence?

Some say that the definition of intelligence is irrelevant if the result is the same:

If a computer can use the power of the internet to achieve human-like results

It remains unclear whether the information is then transferred to the brain's visual cortex, where sight information is normally sent, or to its somatosensory cortex, where touch data from the tongue is interpreted, Wicab neuroscientist Aimee Arnoldussen says. "We don't know with certainty," she adds.

<http://www.scientificamerican.com/article/device-lets-blind-see-with-tongues/>

Tutorial 28.9

1. A.I.
2. NLG (Natural language generation)
3. Singularity

2nd November

Symbol-oriented community- in today’s world, logics, everything uses symbols for different meanings.

Connectionist- neural network, how the connections of actions are connected and make decisions and learn.

Toy Domain- Blocks world- simplifying problems to make them easier to handle. Use blocks you can move, logic p -> q etc.

Top down vs. bottom up approach

Top down:

* Symbolic
* Systematic search
* Manage goals
* Planning
* Logic
* Natural Language Generation

Bottom up:

* Connectionist
* No need to model everything
* Optimizing: Mario wants to go as right as possible without dying
* Limitations on opacity: blackbox probing problem: Trying the neural network for different results.
* How do your entities interact -> Not why you’re getting results, but how. Not about the entities themselves.
* E.g. trying to recognise an apple from pixels, it’s about the relation of the pixels instead of looking at individual pixels.
* Deep learning- very difficult and scientists have difficulties understanding how deep learning works.