Spring 2015 - Berkeley, CA
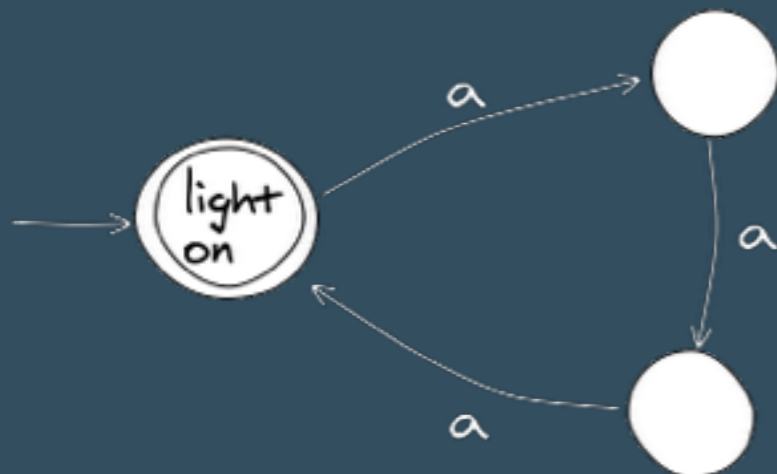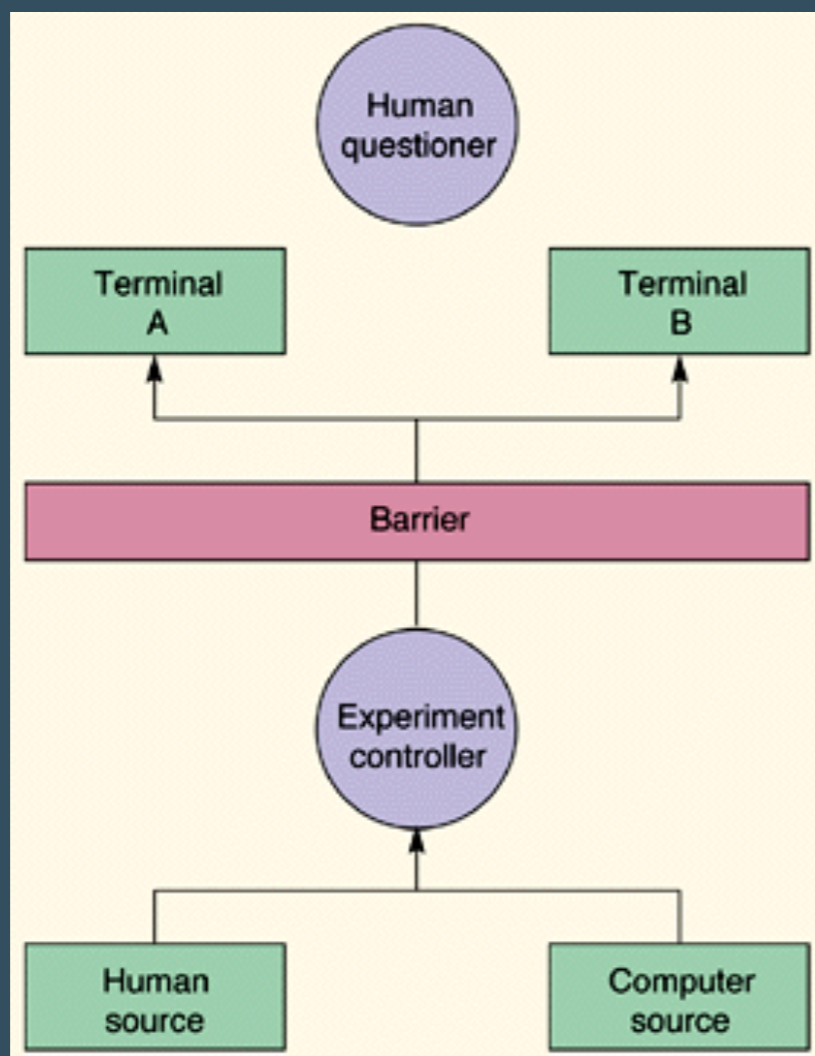
CS24

FRESHMAN SEMINAR FOR CS SCHOLARS

WEEK 8 - ARTIFICIAL INTELLIGENCE

THE TURING TEST IS A TEST OF A MACHINE'S ABILITY TO EXHIBIT INTELLIGENT BEHAVIOR EQUIVALENT TO, OR INDISTINGUISHABLE FROM, THAT OF A HUMAN.

http://www.newscientist.com/
embedded/visual-turing-test

http://xkcd.com/329/

You were mistaken. Which is odd, since memory shouldn't be a problem for you.
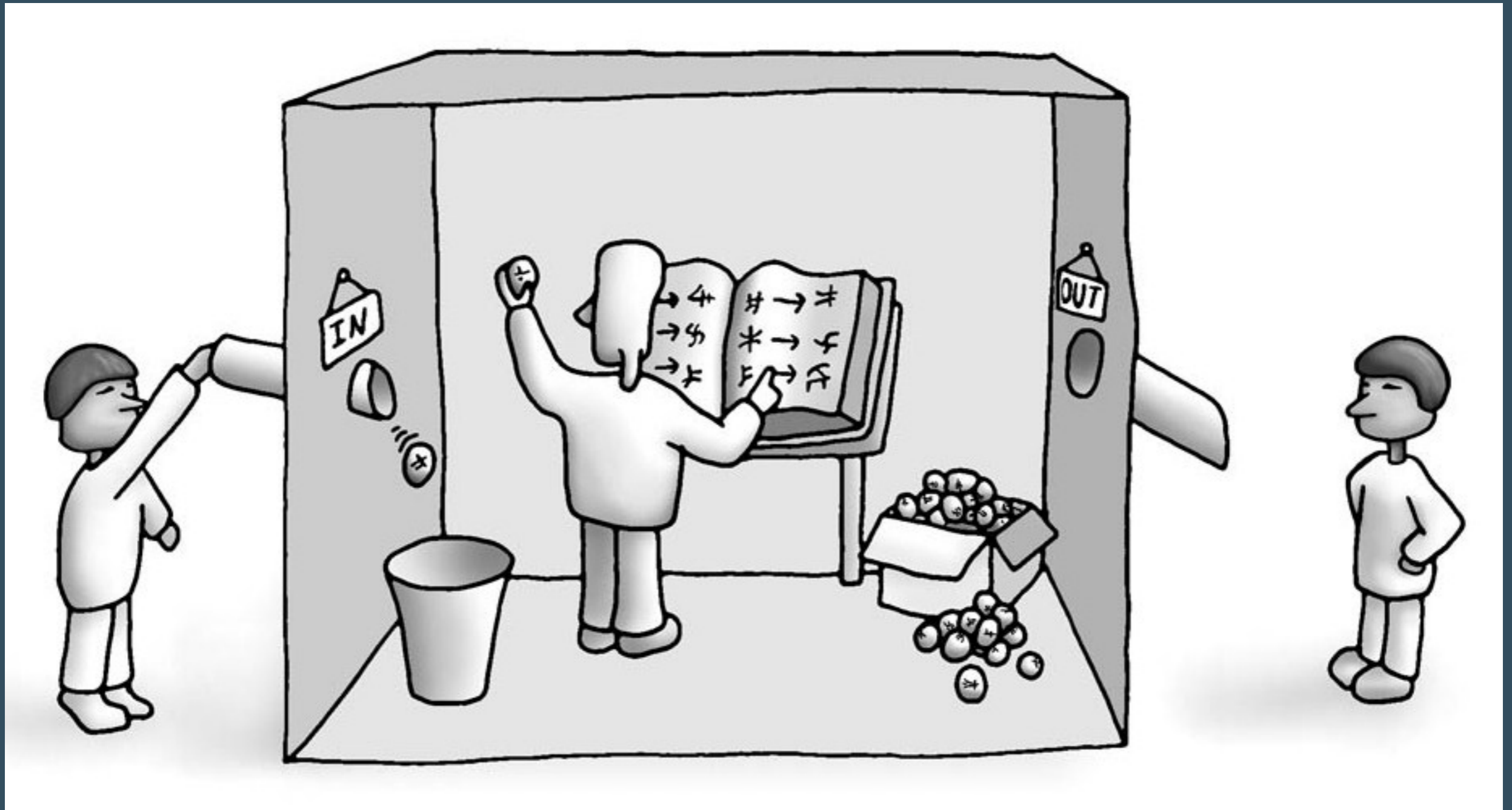
https://www.youtube.com/watch?v=BoU6LkfxUtI

3

ARE THESE AI AGENTS INTELLIGENT?

A computer cannot "originate anything" but only "can do whatever we know how to order it to perform" (Lovelace 1842)

http://www.iep.utm.edu/art-inte/

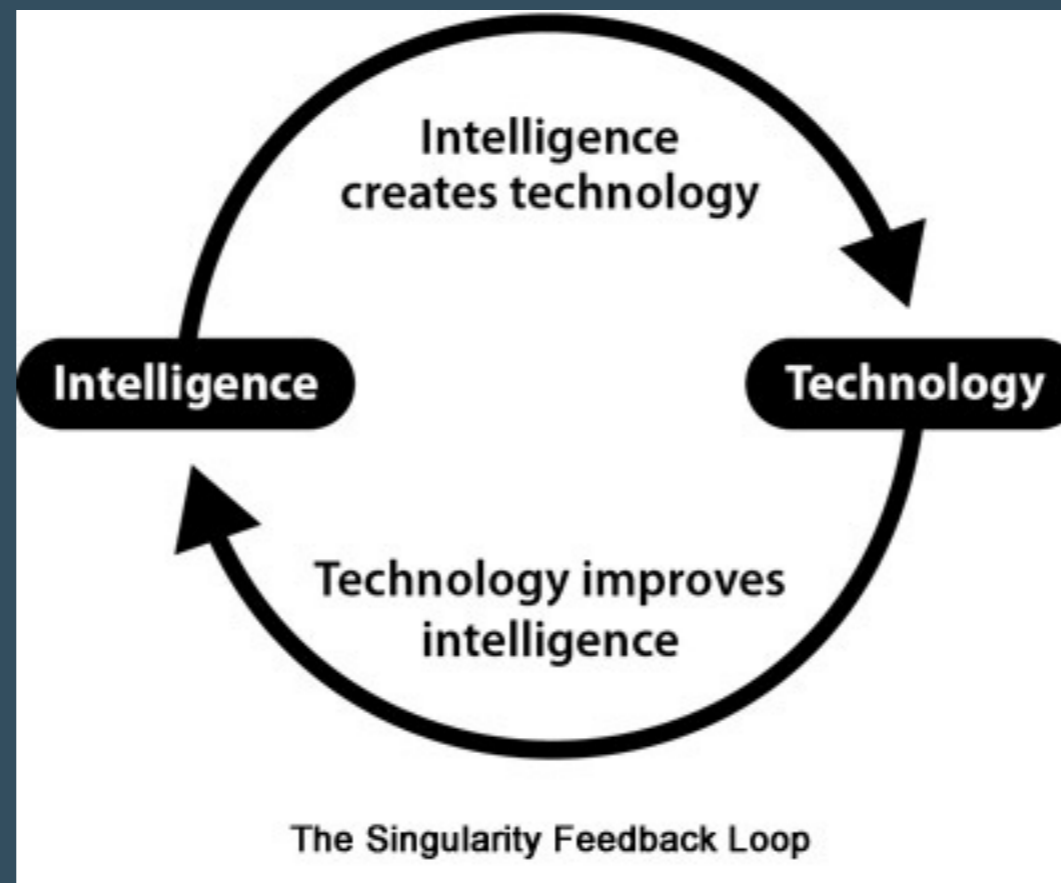JOHN SEARLE'S CHINESE ROOM EXPERIMENT

Even if absolute first person authority were granted, the "systems reply" points out, the person's imagined lack, in the room, of any inner feeling of understanding is irrelevant to claims AI, here, because the person in the room is not the would-be understander.
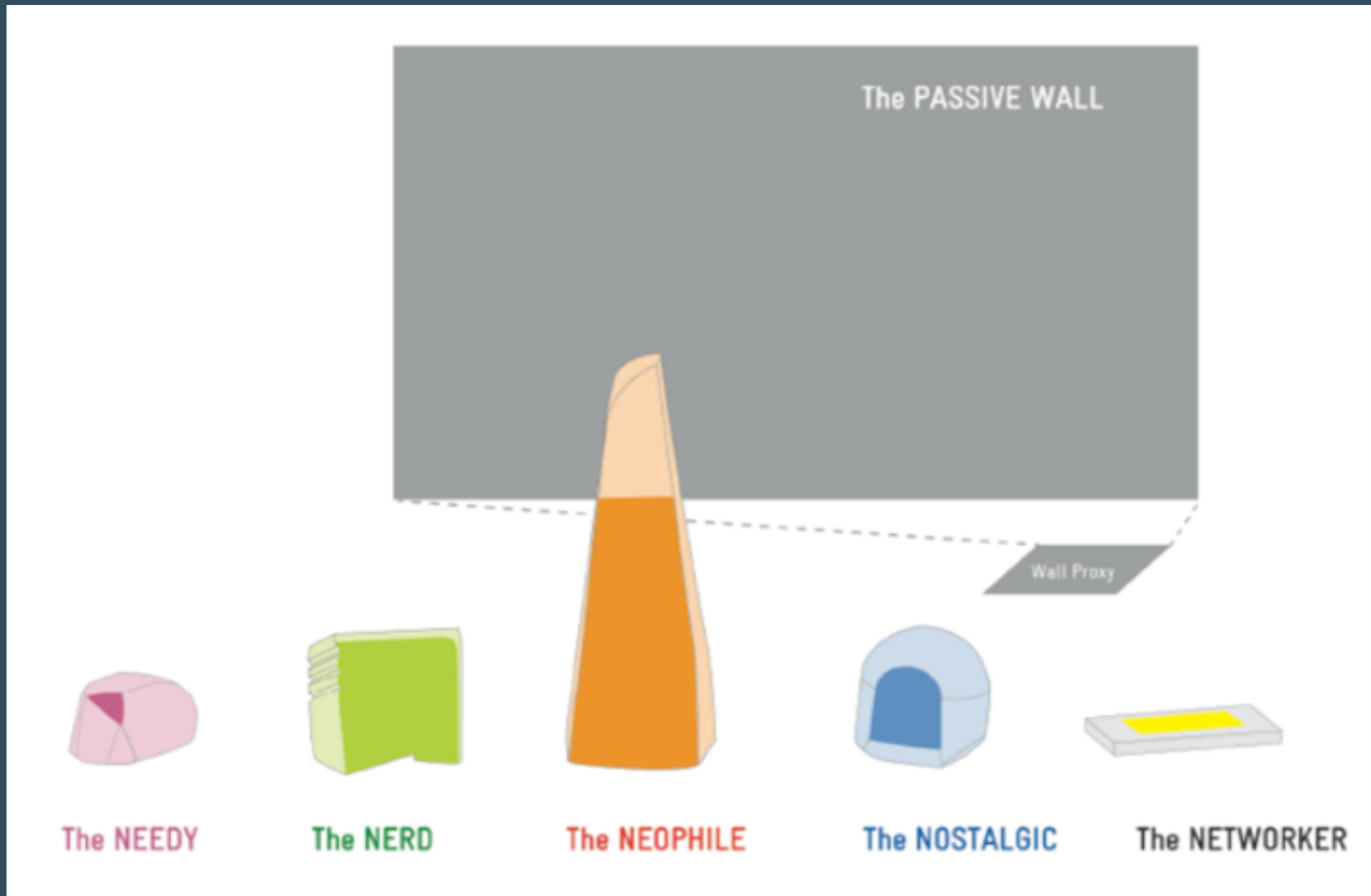
WHOLE SYSTEM VIEW

The understander would be the whole system (of symbols, instructions, and so forth) of which the person is only a part; so, the subjective experiences of the person in the room (or the lack thereof) are irrelevant to whether the system understands.

http://www.iep.utm.edu/art-inte/

The Intelligence Explosion

DOES ALL INTELLIGENCE NEED TO BE "SMART"?

ANIMISM

The PASSIVE WALL

Wall Proxy

The NEEDY   The NERD   The NEOPHILE   The NOSTALGIC   The NETWORKER

Needy

Figure 3
Needy: Seeks attention, provokes and interrupts other AniThings and people.

The Nerd

Figure 4
The Nerd: Extremely structured and organized, geeky, persistent.

Neophile

Figure 5
Neophile: Proud of finding new information, fast, manic, short attention span.

P. van Allen and J. McVeigh-Schultz, "AniThings: Animism and Heterogenous Multiplicity," 2013.

SPEECH PROCESSING

SPEECH RECOGNITION AND PRODUCTION

NLP

MACHINE TRANSLATION

PLANNING

SCHEDULING, GAME PLAYING

MACHINE LEARNING

DECISION TREE LEARNING, VERSION SPACE LEARNING

EXPERT SYSTEMS

DECISION SUPPORT SYSTEMS, TEACHING SYSTEMS

NEURAL NETWORKS

E.G. BRAIN MODELLING, TIME SERIES PREDICTION, CLASSIFICATION

EVOLUTIONARY COMPUTATION
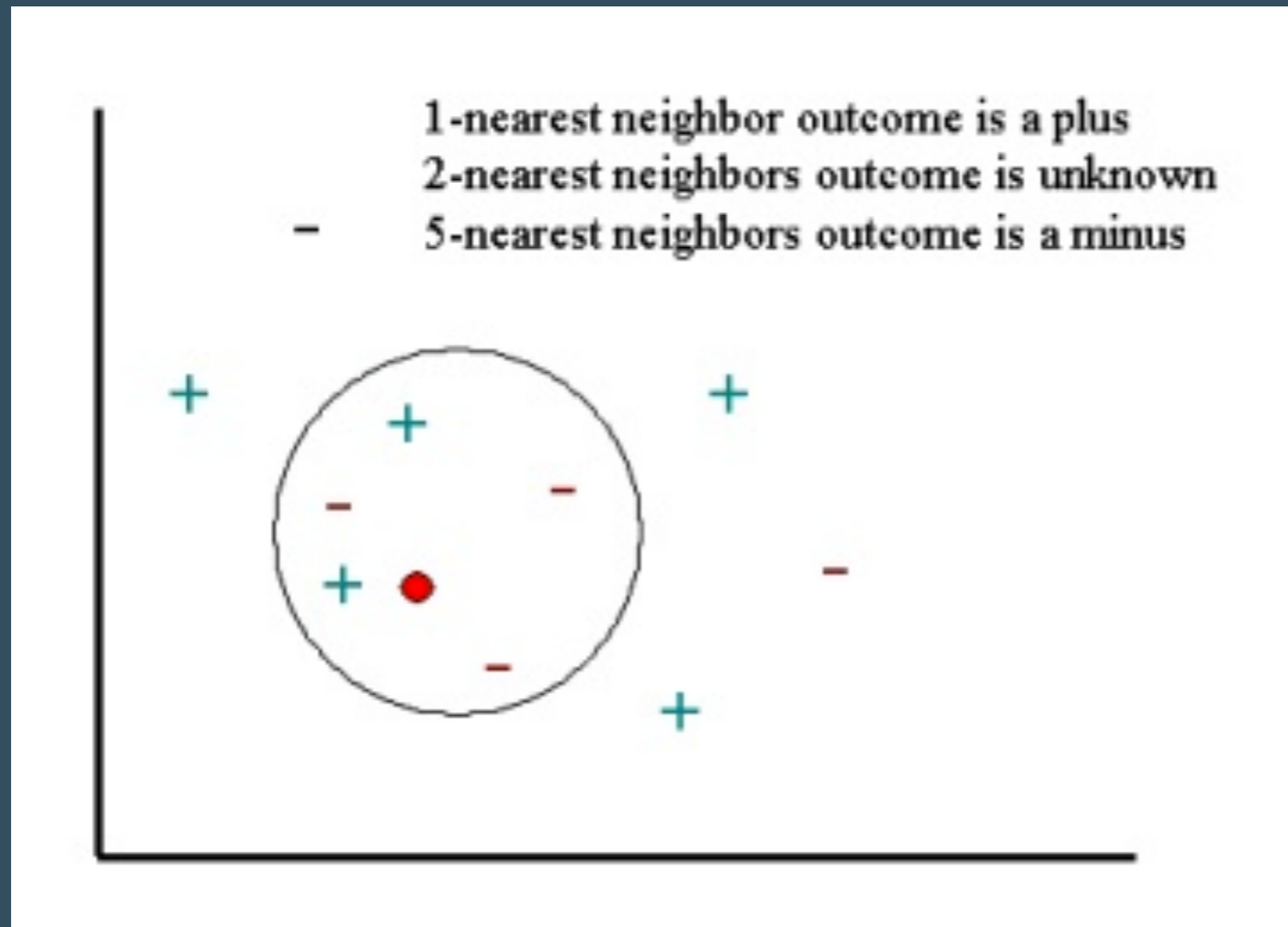
E.G. GENETIC ALGORITHMS, GENETIC PROGRAMMING

VISION

OBJECT RECOGNITION, IMAGE UNDERSTANDING

## ROBOTICS

INTELLIGENT CONTROL, AUTONOMOUS EXPLORATION

http://www.cs.bham.ac.uk/~jxb/IAI/w2.pdf

1-nearest neighbor outcome is a plus
2-nearest neighbors outcome is unknown
5-nearest neighbors outcome is a minus

Distance functions

Euclidean $\sqrt{\sum_{i=1}^{k}(x_i - y_i)^2}$

Manhattan $\sum_{i=1}^{k}|x_i - y_i|$

Minkowski $\left(\sum_{i=1}^{k}\left(|x_i - y_i|\right)^q\right)^{1/q}$

A majority vote classification routine; unsupervised; k is usually an odd number
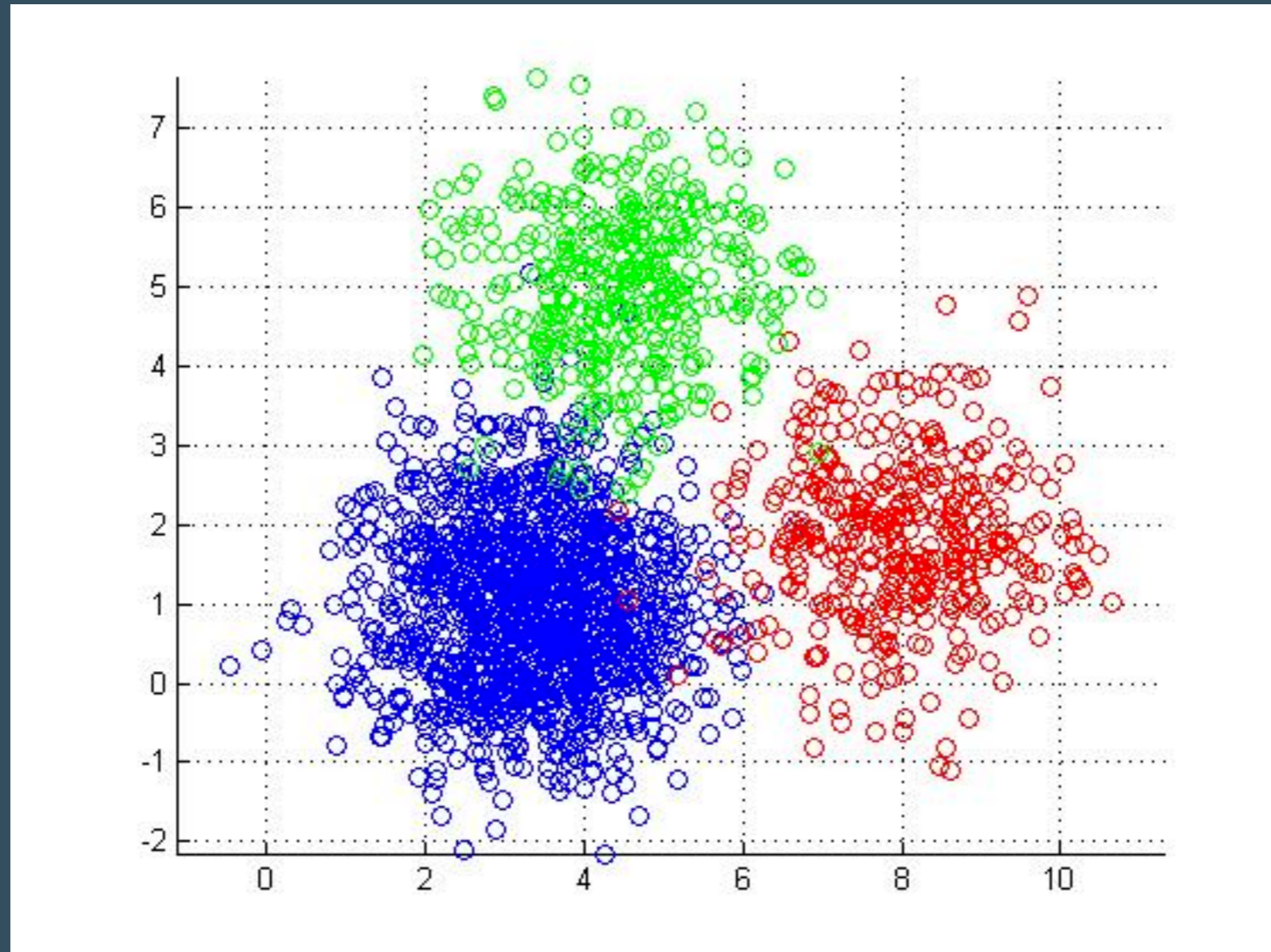
Cluster analysis routine; unsupervised; k is usually an odd number

Body algorithm - Be the machine

```
centers = {3 tallest people}

for(Person x in class)
  x.center :=  find_closest_center(centers)
  x.point_to_your_center()


for(Center c in centers)
   dist_moved = c.move_to_the_center of your_assignees()


if(dist_moved > a_step)
   goto 2
```

TODOS

ATTEND A RESEARCH SEMINAR - FREE LUNCH!
WRITEUP IN LATEX - 1 PAGE - PICTURES + DIAGRAMS WELCOME
SUBMIT TO TIME CAPSULE REPO
DUE AT THE END OF SEMESTER - MAY 8

CATCHUP ON MISSING WORK

QUESTIONS ?

Week 9

SPRING BREAK