

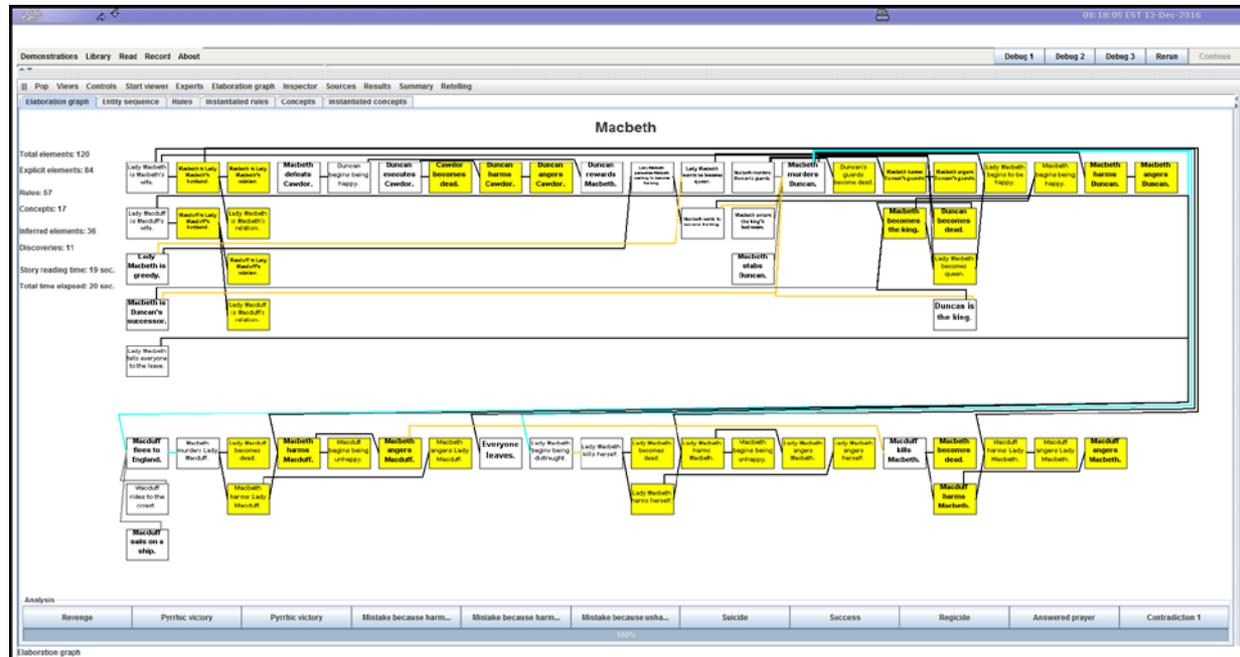
Farewell Address



2018

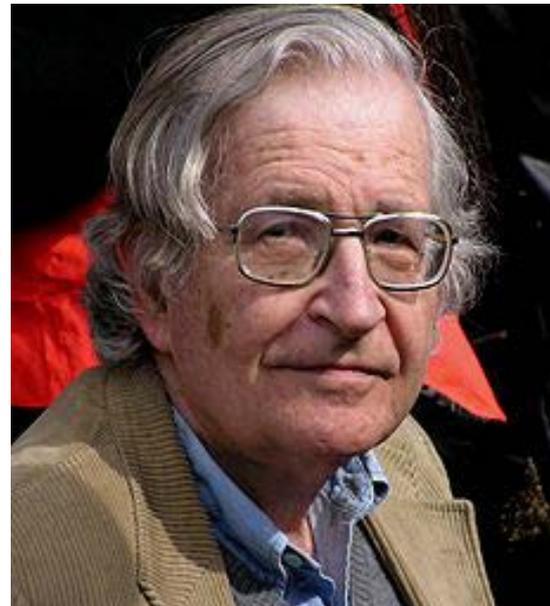


Winston: Stories are the answer



The Inner Language Hypothesis

We are different because we, **uniquely**, build rich symbolic descriptions of situations and events



The Strong Story Hypothesis

If we are to have a full computational account of human intelligence, then we have to understand our uniquely human story competence.

The Social Animal Hypothesis

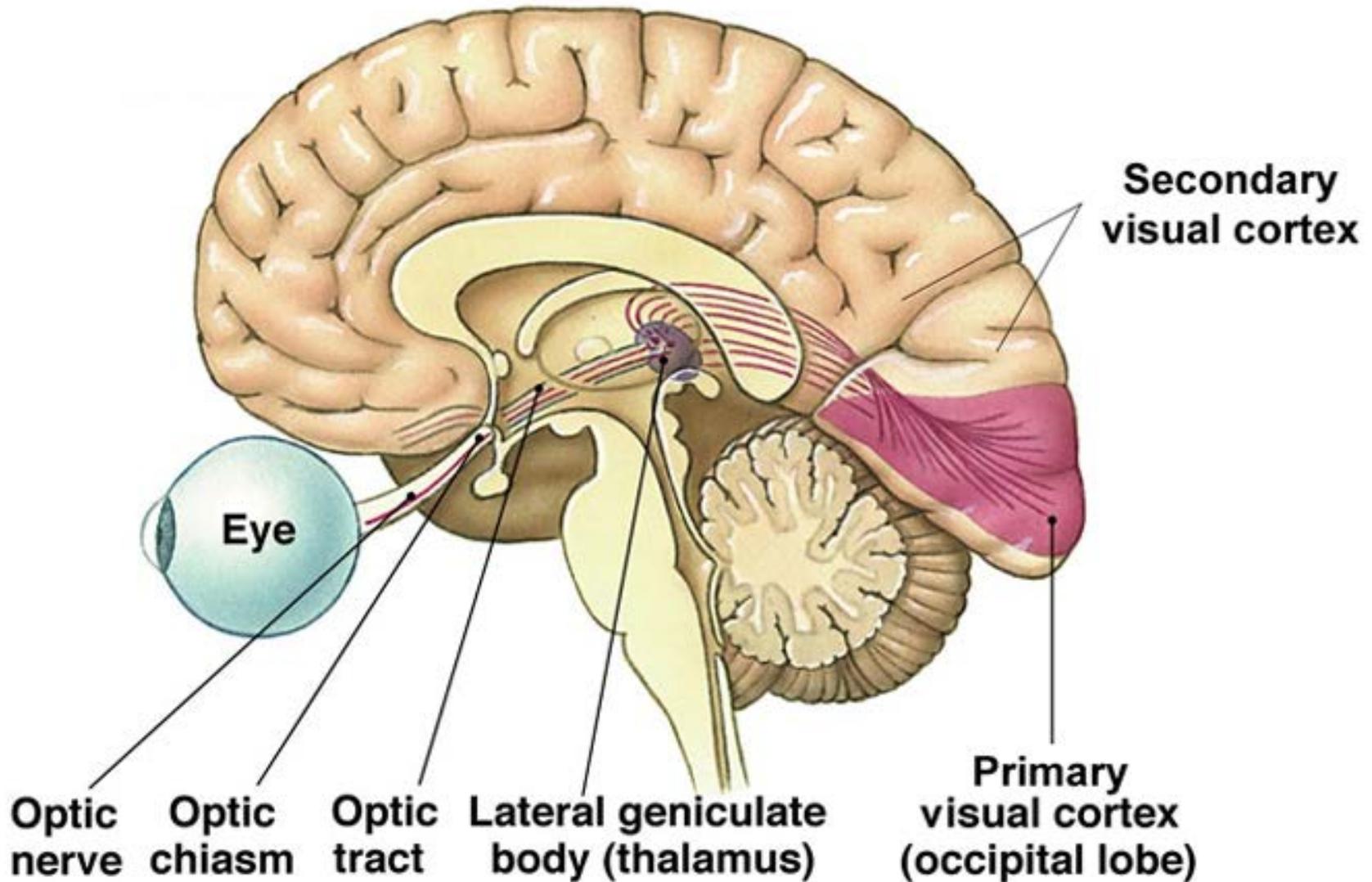
We talk to each other.

We talk to ourselves.

The Directed Perception Hypothesis

The mechanisms that enable us humans to direct and hallucinate with our perceptual faculties separate our intelligence from that of other primates.

The Exotic Engineering Hypothesis



~1970



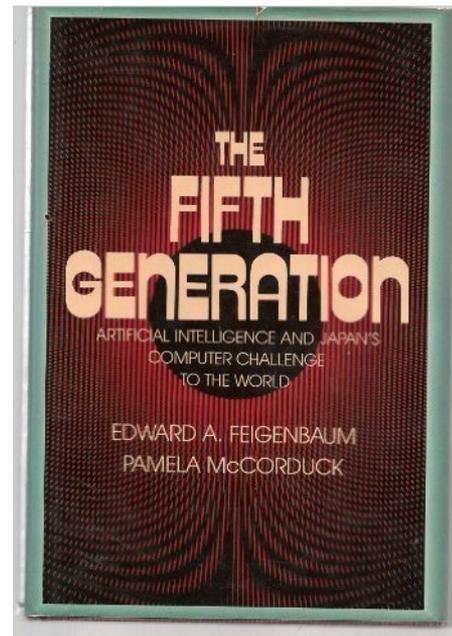
Newell and Simon:
The general problem
solver is the answer
Alert the people



~1980



Feigenbaum:
Rule based expert systems
are the answer



~1985



Pearl:

Bayesian inference
is the answer

~1990



Brooks:

Subsumption is the answer



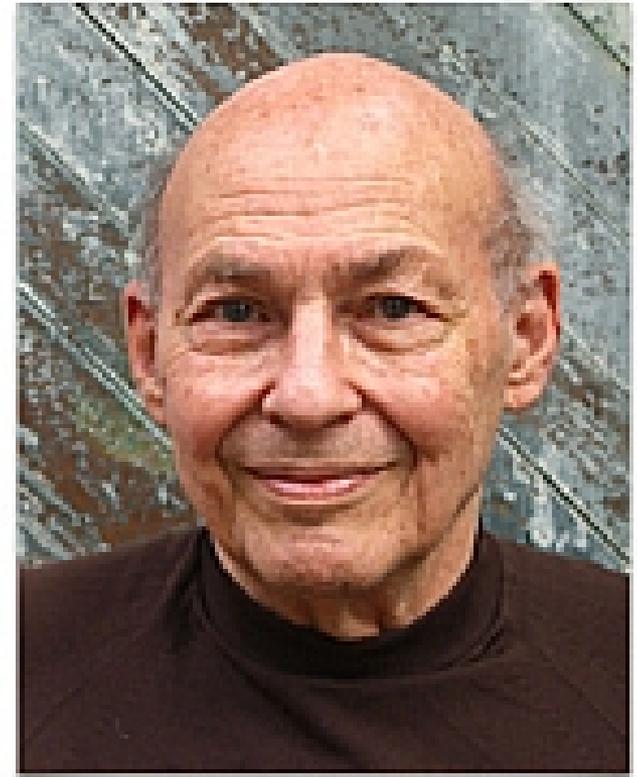
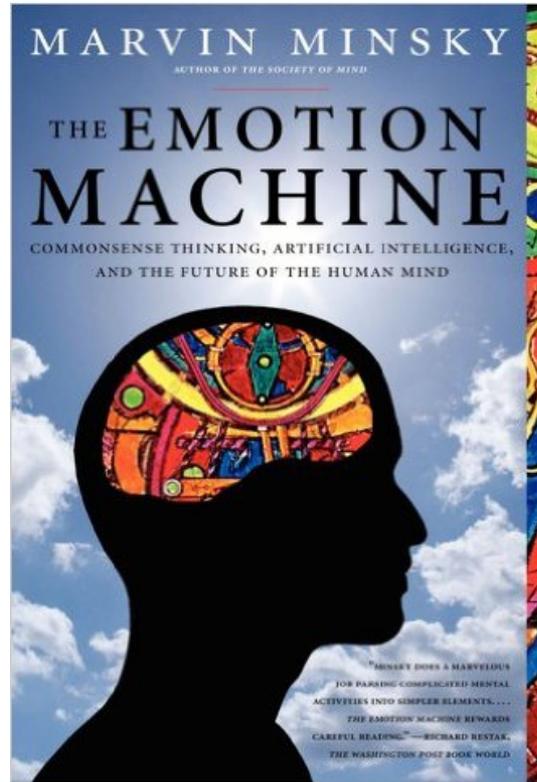
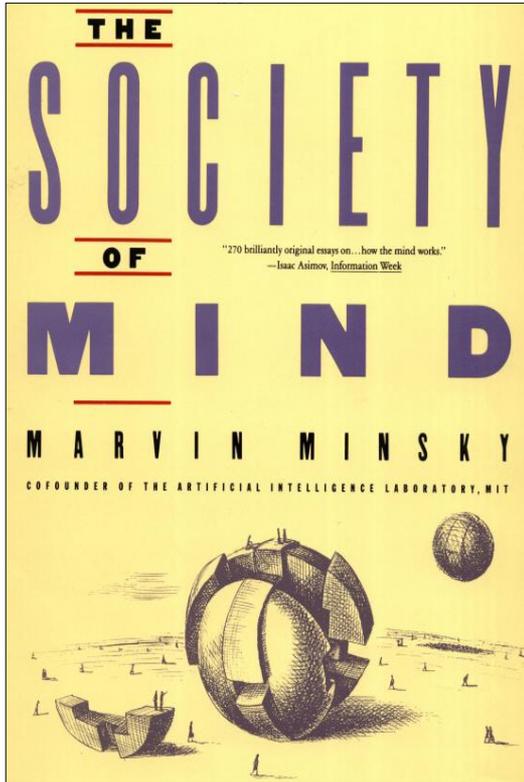
~2012



Hinton:
Deep neural nets
are the answer

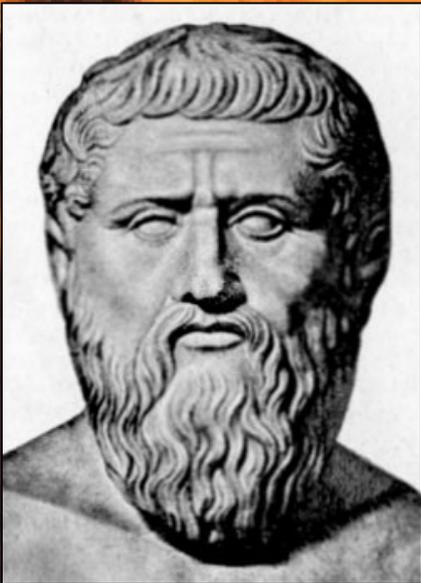


We need it all



Intelligence rests on multiple representations, methods, agents, all working together

Can a program think
without a body?



Can a machine be
self aware?

Suitcase Words

Intelligence

Creativity

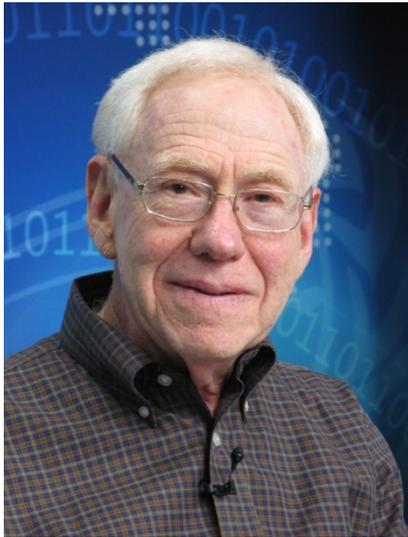
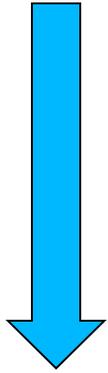
Emotion

...



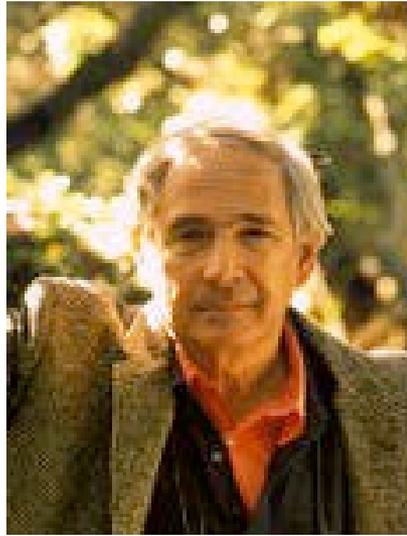
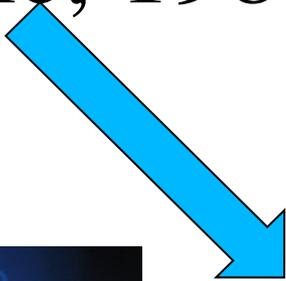
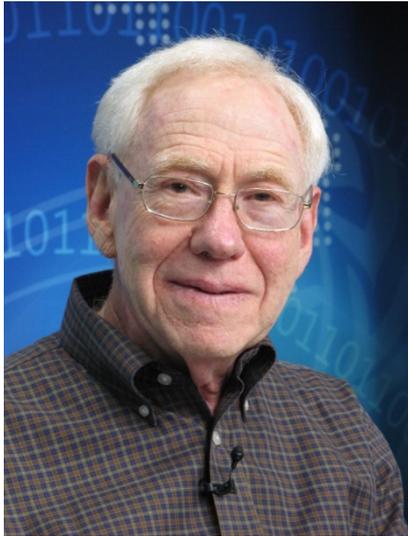
Evolution

- Dreyfus, 1967: It is impossible

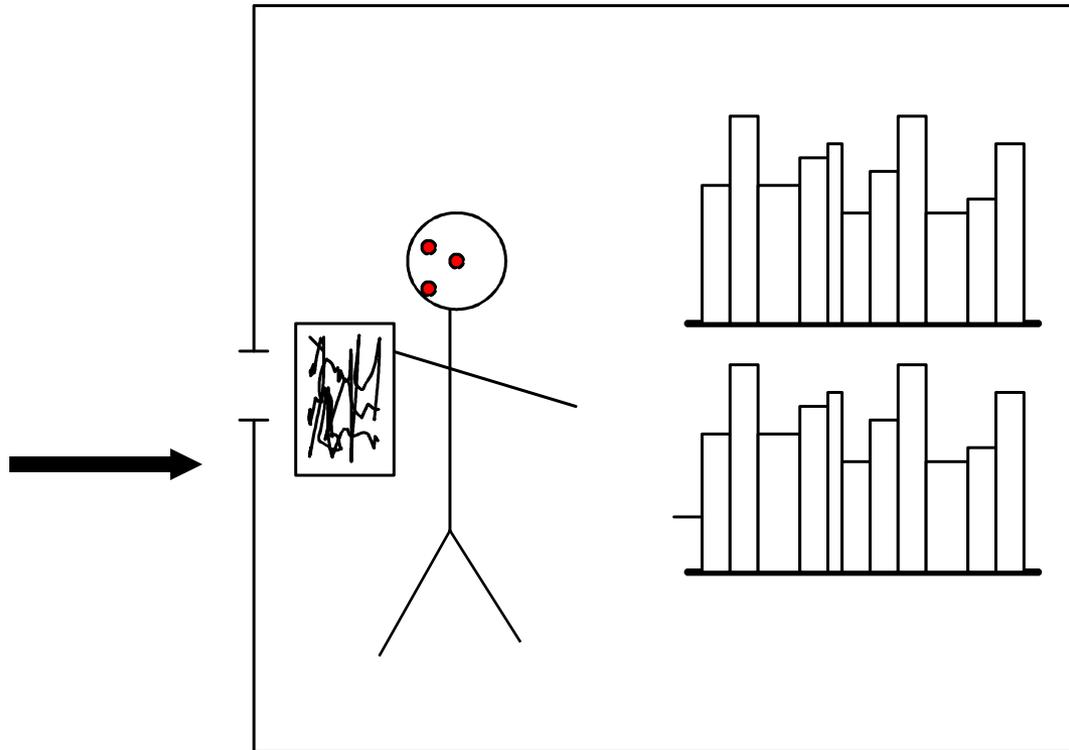


Evolution

- Dreyfus, 1967: It is impossible
- Searle, 1980: It only appears smart

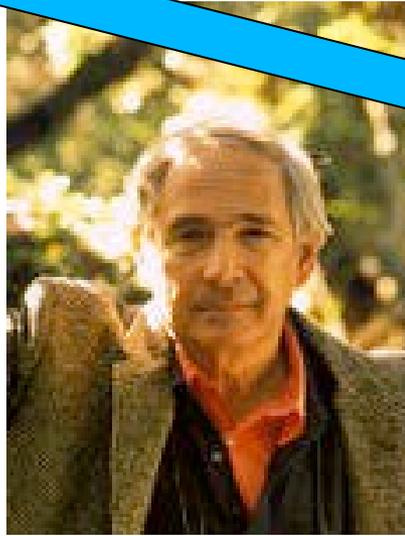
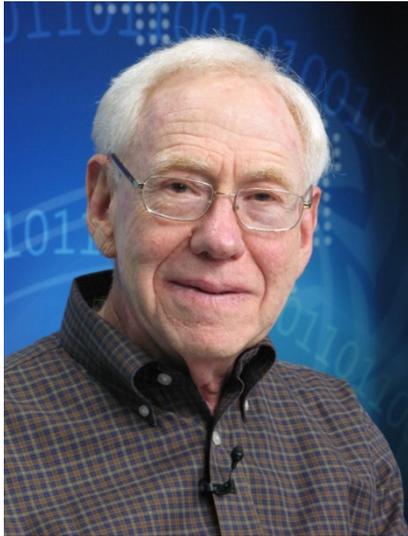


The Chinese-Room Argument



Evolution

- Dreyfus, 1967: It is impossible
- Searle, 1980: It only appears smart
- Musk, Hawking, 2014: It is a threat



2018

Winston: With technology,
we are summoning the
demon. AI is our only hope

Scientific Perspective

Architectures deploying

Methods enabled by

Constraints exposed by

Representations supporting

Models of thinking, perceiving, acting

So we can understand ourselves

Engineering Perspective

Architectures deploying

Methods enabled by

Constraints exposed by

Representations supporting

Models of thinking, perceiving, acting

So we can build stuff

Embodiment

Reasoning

Goal trees

Rules

Basic search

Fancy search

Games

Constraints

Bayes nets

Learning

Nearest neighbors

Classification trees

Genetic algorithms

Sparse spaces

SVM

Boosting

Deep learning

Our symbolic species

One-shot learning

Representation

Architectures

Merge

Stories

Self awareness

Lattice learning

Being Smarter Perspective

Collect powerful ideas

Use your eyes and draw

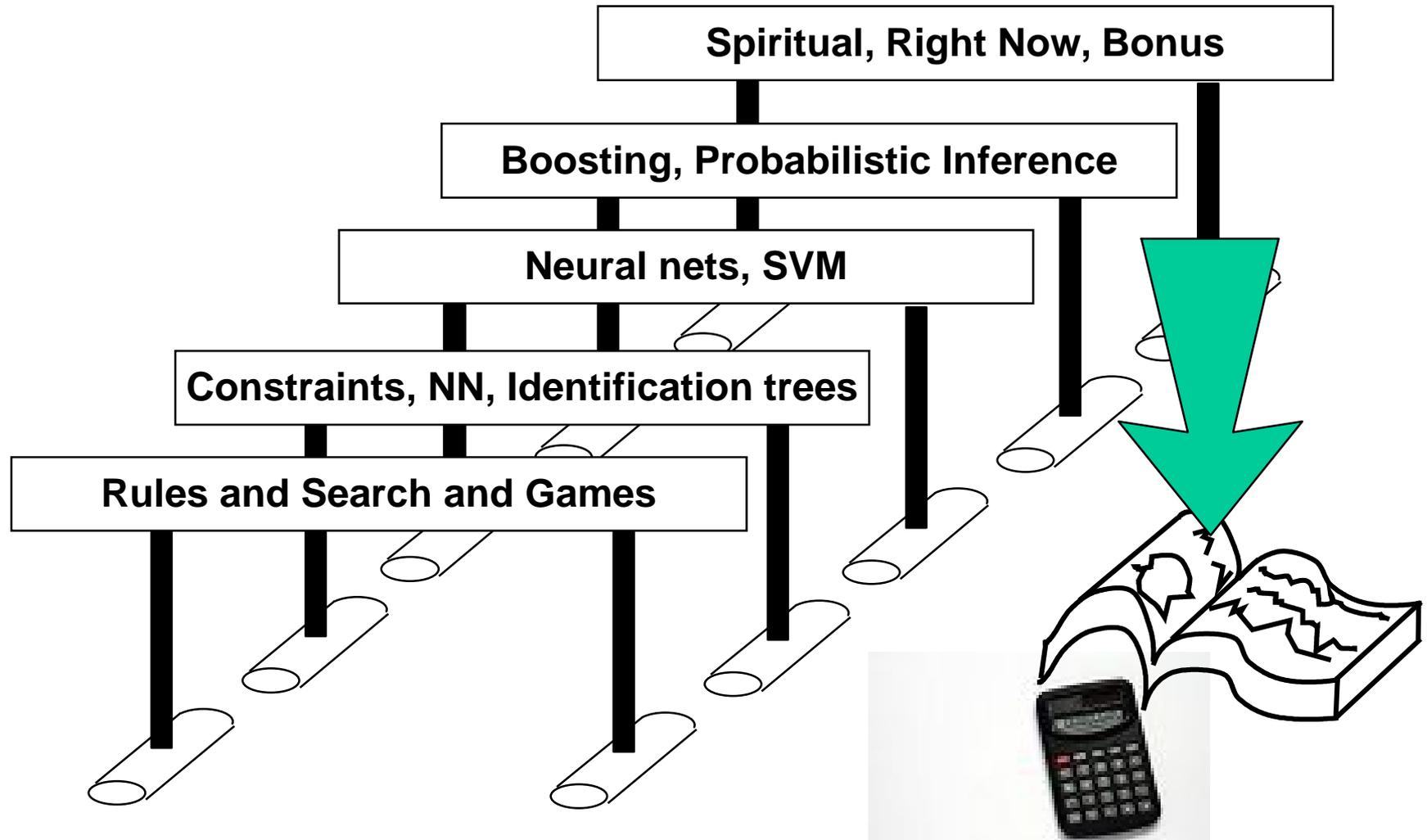
Use your mouth and converse

Take notes to force concentration

Sell new revenue, not saving money

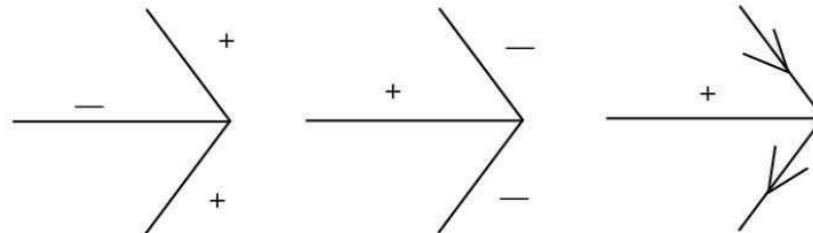
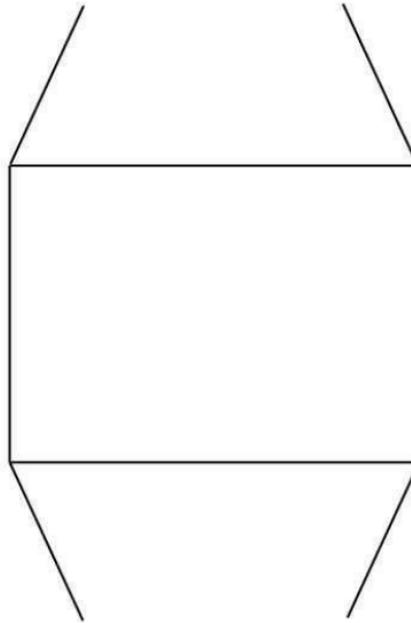
Acquire a library of stories

How do you prepare for it



Problem 3: Constraints in Drawings (20 points)

You are working on a problem set with various friends. In one question, you are presented with the drawing below, consisting of arrow junctions and junctions with just one line attached. You are to find junction labellings consistent with each other in the three-face world, which means there are just three ways to label the arrows, as shown. Junctions with just one line attached provide no constraint. You pile up all three labels on each of the four arrow junctions and start to work. Your friends Joshua, Jason, and Justin say that there is no constraint that eliminates any of the 12 junctions you have piled up, so there must be $3^4=81$ ways to interpret the drawing such that the three-face world constraints are obeyed. Sarah, Stephanie, and Susana say they are nuts.



Lab Average

Quiz 1

Core (100)

Core

5 \geq 87

4 \geq 72

3 \geq 59

Quiz 2

Core (100)

SRN

Core

SRN

5 \geq 88

4 \geq 72

3 \geq 59

Quiz 3

Core (100)

SRN

Core

SRN

5 \geq 90

4 \geq 78

3 \geq 64

Quiz 4

Core (100)

SRN

Core

SRN

5 \geq 89

4 \geq 78

3 \geq 64

Your computed grade:

AI Summer 2019 at the MIT Beaver Works

Opportunities for MIT Undergraduates & Graduates
to Perform, Present & Publish World-Class Research in AI

Summer 2018 Projects

Uncertainty Propagation in Deep Neural Networks^{1,2,3}

Using HPC to gain insights into Neural Network Training^{1,6}

Sparse, Symmetric DNN Topologies for Sparse Training^{1,2,3,5,6}

Building a Brain^{1,4,6}

Training Sparse Neural Networks^{1,2,3,6}

Counting Neural Nets^{1,2}

Maps of Mathematics^{1,2,3}

¹Presented at MIT CRIBB seminar, ²Presented at IEEE URTC, ³Published on Arxiv.org,

⁴NEDB in preparation, ⁵AMS invited talk, ⁶IEEE HPEC in preparation

Contact: kepner@csail.mit.edu & vijayg@csail.mit.edu





Join Kyla and Friends for Cookies With Canines

Hayden: Thurs, Dec 13, 2:00pm-3:30p



HOW TO SPEAK

**Stimulating Lectures
Successful Oral Examinations
Winning Job Talks
And Getting Famous**



Friday, 1 February 2017, 11am, 10-250

6.XXX Focii

Computational

...models of intelligence

...and how it develops

...and how it is implemented

...and how it is amplified



Taught the old-fashioned way

- You read
- You think
- You write
- I ask questions
- You answer my questions

Packaging and Life Topics

Abstracts

Business plans

Proposals

Press releases

Slide presentations

Job interviews

Promotion letters

Study briefs

Letters of complaint

Panel discussions

Trip reports

How to be remembered

Elevator talks

Whom to marry

Opening moves

How to threaten people

From the Underground Guide

Exams were described as “incredibly difficult,” “brutal,” and “frustrating.” They were graded harshly and “covered topics not taught in the class.”

From the Underground Guide

Officially, Winston has never confirmed or denied that there are quizzes for this class. His students seem to take after him --- comments were evenly split between complaints of brutal weekly 9:30AM quizzes and a "7-hour final", and denial of any and all testing. We at the UG aren't quite sure what to make of this.

The Staff 2018

Sanchit Bhattacharjee

Kifle Woldu

Alexandros Charidis

Matt Wu

Samir Dutta

Richard Yip

Marie Shi Feng

Suri Bandler

Ariel Jacobs

Kimberle Koile

Victoria Longe

Randall Davis

Smriti Pramanick

Dave Sella on AV

Kyla LeChien

Why bother?

It is hard to overstate importance of the on-line course evaluations for EECS. I personally read thousands of them, and **we use them on a daily basis to help guide staffing decisions** (as most of you know). EECS uses these evaluations as input to the yearly faculty assessment, and to decide on, and to support, award nominations (including institute-wide awards such as the Goodwin medal, the Bose teaching award, and MacVicar fellows). The HKN underground guide is generated from the data in the on-line course evaluations. And finally, **the School of Engineering also uses the evaluations when deciding on resource allocation.**

Dear Mr. Gerlach

I am in my n th semester at MIT, which ~~I greatly enjoy~~ is hard work ~~but worth~~ it.

I write today because it occurred to me that 15,000 applicants who didn't get in would happily have had my spot, and I would not be here if I had not had your [guidance, support, inspiration...].

The Most Powerful of All

- ★ You can do it
- ★ Only you can do it
- ★ You can't do it alone
- ★ ★ You won't be alone if you take care of your people