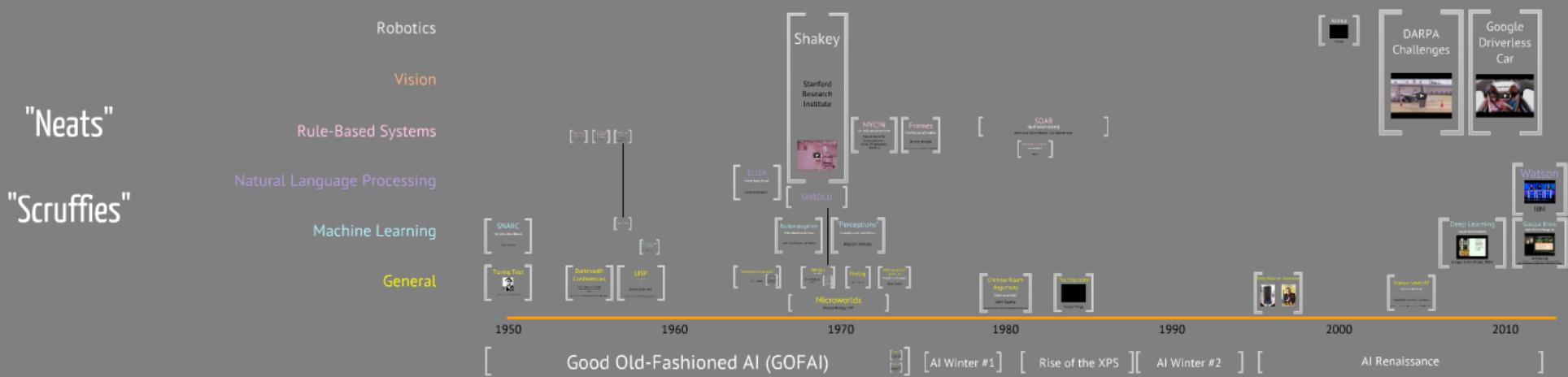
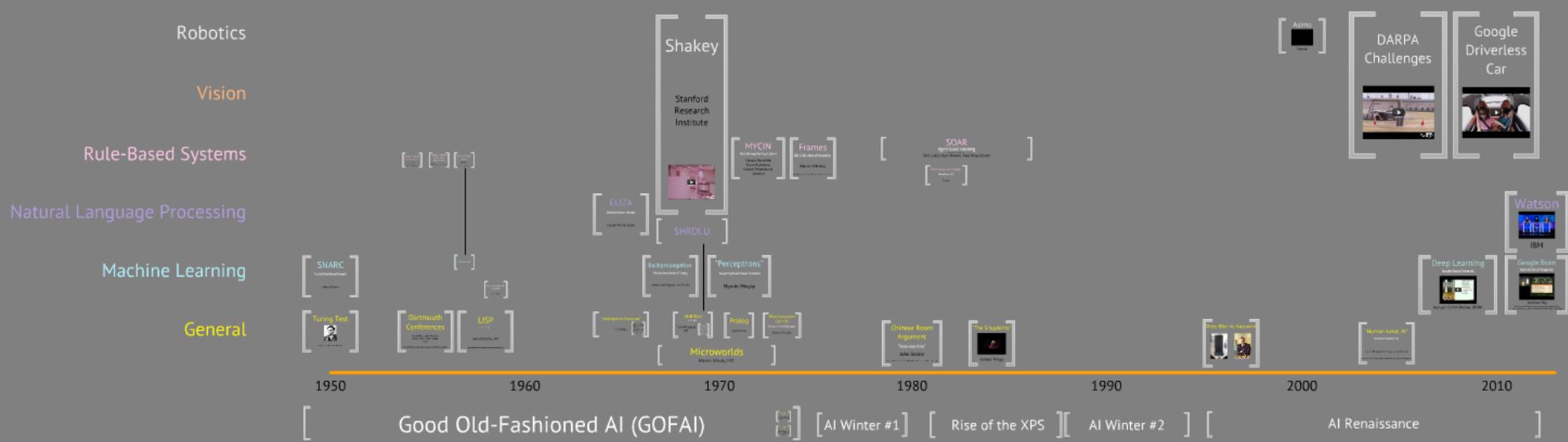


History of AI



History of AI



Turing Test



<http://loebner.net/Prizef/TuringArticle.html>

SNARC

First Artificial Neural Network

Marvin Minsky

Dartmouth Conferences

Marvin Minsky, John McCarthy,
Herbert Simon, Allen Newell,
et al.

<http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html>

Logic Theorist

"We have solved the mind-body problem"

Allen Newell, Herbert Simon, J. C. Shaw

<http://shelf1.library.cmu.edu/IMLS/MindModels/logictheorymachine.pdf>

General Problem Solver (GPS)

Domain-Independent Reasoning

Allen Newell, Herbert Simon, J. C. Shaw

LISP

(i.e., "LIST Processing")

John McCarthy, MIT

<http://www-formal.stanford.edu/jmc/history/lisp/lisp.html>

(i.e., "LIST Processing")

(i.e., "Lots of Irritating, Stupid Parentheses")

(i.e., "Lots of Irritating, Stupid Parentheses")

Advice Taker

Theoretical System

John McCarthy

<http://www-formal.stanford.edu/jmc/mcc59.pdf>

Machine Evolution

a.k.a. Genetic Algorithms

R. M. Friedberg

ELIZA

Simulated Rogerian Therapist

Joseph Weizenbaum

"Intelligence Explosion"

I. J. Good

"Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultra-intelligent machine could design even better machines; there would then unquestionably be an "intelligence explosion," and the intelligence of man would be left far behind... Thus the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control. It is curious that this point is made so seldom outside of science fiction. It is sometimes worthwhile to take science fiction seriously."

"Speculations Concerning the First Ultraintelligent Machine", Advances in Computers, vol. 6, 1965.

"Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultra-intelligent machine could design even better machines; there would then unquestionably be an "**intelligence explosion**," and the intelligence of man would be left far behind... Thus the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control. It is curious that this point is made so seldom outside of science fiction. It is sometimes worthwhile to take science fiction seriously."

"Speculations Concerning the First Ultraintelligent Machine", Advances in Computers, vol. 6, 1965.

ELIZA

Simulated Rogerian Therapist

Shakey

Stanford
Research
Institute



MYCIN

Bacterial Recognition Expert System

Edward Shortliffe,
Bruce Buchanan,
Edward Feigenbaum,
Stanford

Frames

Life is like a box of tem-

Marvin Minsky

<http://web.media.mit.edu/~minsky/papers/Frames/>

SHRDLU

Blocks World

Terry Winograd,
MIT

```
Person: Pick up a big red block.  
Computer: Ok.  
Person: Stack it on the pyramid.  
Computer: What pyramid?  
Person: The one you are holding in your  
hand.  
Person: Put the small blue block on top of  
the red block.  
Person: Put the green block on top of  
the red block.  
Computer: Ok.  
Person: Put the yellow block on top of  
the green block.  
Computer: Ok.  
Person: Put the orange block on top of  
the yellow block.  
Computer: Ok.  
Person: How many blocks are not in the box?  
Computer: One.  
Person: Which one?  
Computer: The orange block.  
Person: Is at least one of them narrower than the one  
which I said I had to pick up?  
Computer: Yes, the red block.
```

Prolog

Alain Colmerauer

Microworlds

Marvin Minsky, MIT

1970

SHRDLU

Blocks World

Terry Winograd,
MIT

Person: Pick up a big red block.
Computer: OK.
Person: Grasp the pyramid.
Computer: I don't understand which pyramid you mean.
Person (changing their mind): Find a block which is taller than the one you are holding and put it into the box.
Computer: By "it", I assume you mean the block which is taller than the one I am holding.
Computer: OK.
Person: What does the box contain?
Computer: The blue pyramid and the blue block.
Person: What is the pyramid supported by?
Computer: The box.
Person: How many blocks are not in the box?
Computer: Four of them.
Person: Is at least one of them narrower than the one which I told you to pick up?
Computer: Yes, the red cube.

Person: Pick up a big red block.

Computer: OK.

Person: Grasp the pyramid.

Computer: I don't understand which pyramid you mean.

Person (changing their mind): Find a block which is taller than the one you are holding and put it into the box.

Computer: By "it", I assume you mean the block which is taller than the one I am holding.

Computer: OK.

Person: What does the box contain?

Computer: The blue pyramid and the blue block.

Person: What is the pyramid supported by?

Computer: The box.

Person: How many blocks are not in the box?

Computer: Four of them.

Person: Is at least one of them narrower than the one which I told you to pick up?

Computer: Yes, the red cube.

Backpropagation

Effective Neural Network Training

Arthur Earl Bryson, Yu-Chi Ho

SNARC

First Artificial Neural Network

Marvin Minsky

Advice Taker

Machine Evolution

R.M. Hartung

Backpropagation

Effective Neural Network Training

Arthur Earl Bryson, Yu-Chi Ho

"Perceptrons"

Recognizing Neural Network Limitations

Marvin Minsky

Turing Test



Dartmouth Conferences

Marvin Minsky, John McCarthy,
Herbert A. Simon, Allen Newell,
et al.

Dartmouth School of Computer Science, Hanover, New Hampshire, 1956

LISP

I. J. Good

<https://www.csail.mit.edu/courses/6.S083/>

John McCarthy, MIT

"Intelligence Explosion"

I. J. Good



SHRDLU

Terry Winograd,
MIT

Heads World

Prolog

Alain Colmerauer

**What Computers
Can't Do**

"Knowing That" is not "Knowing How"
Hubert Dreyfus

Microworlds

Marvin Minsky, MIT

1950

1960

1970

Good Old-Fashioned AI (GOFAI)

Herbert Simon

1965

"Machines will be capable,
within twenty years, of doing
any work a man can do."

Marvin Minsky

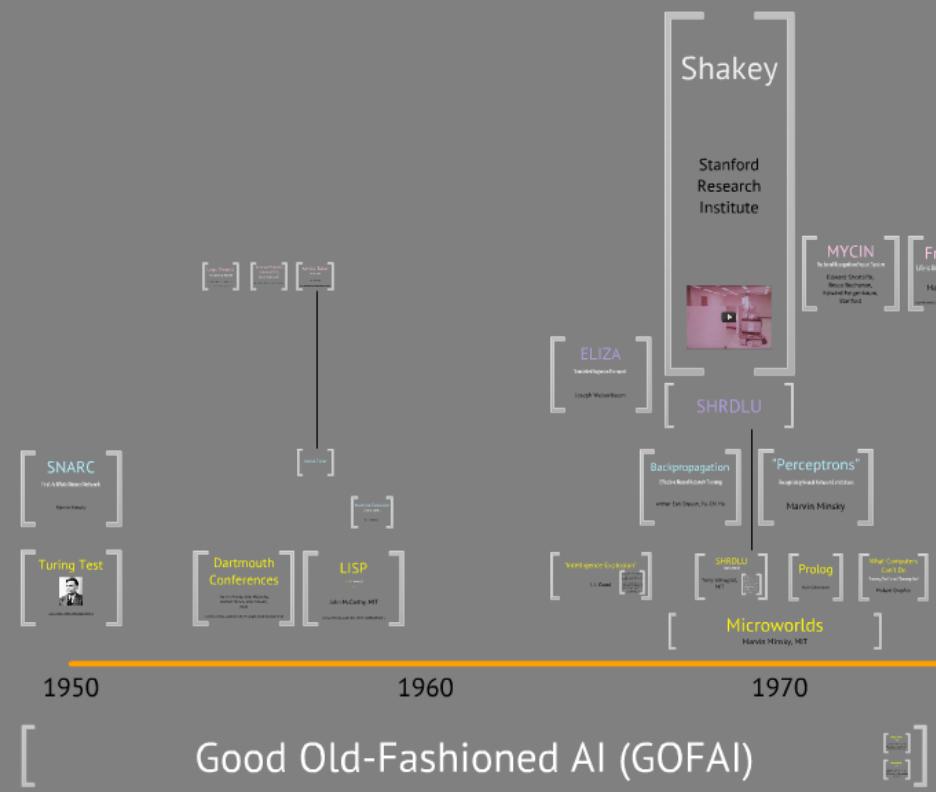
1967

"Within a generation... the problem of creating 'artificial intelligence' will substantially be solved."

His

"Neats"
"Scruffies"

Robotics
Vision
Rule-Based Systems
Natural Language Processing
Machine Learning
General



"Perceptrons"

Recognizing Neural Network Limitations

Marvin Minsky

Prolog

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What Computers Can't Do

"Knowing That" is not "Knowing How"

Hubert Dreyfus

MYCIN

Bacterial Recognition Expert System

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Stanford

Frames

Life is like a box of templates

Marvin Minsky

<http://web.media.mit.edu/~minsky/papers/Frames/frames.html>

[AI Winter #1]

Chinese Room Argument

"Brains cause minds"

John Searle

<http://web.archive.org/web/20071210043312/http://members.aol.com/NeoNoetics/MindsBrainsPrograms.html>

Fifth Generation Project

Now with more LIPS!

Japan

"The Singularity"



Vernor Vinge

SOAR

Agent-based reasoning

<http://sitemaker.umich.edu/soar/home>

John Laird, Allen Newell, Paul Rosenbloom

Fifth Generation Project

Deep Blue vs. Kasparov



Deep Blue vs. Kasparov



"Human-Level AI"

Humanism Through Diversity

Marvin Minsky, Push Singh, Aaron Sloman

<http://www.cs.brown.ac.uk/research/projects/cogaff/aihttp/gis/minsky-sloman-analog-d4.pdf>

2000

2010

AI Renaissance

Asimo



Honda

"Human-Level AI"

Humanism Through Diversity

Marvin Minsky, Push Singh, Aaron Sloman

<http://www.cs.bham.ac.uk/research/projects/cogaff/AIMag/singh-minsky-sloman-aimag-04.pdf>

imo



onda

DARPA Challenges



YouTube



Good
Drive
Ca

Deep Learning

Complex Neural Networks



Juergen Schmidhuber, IDSIA

RPA
enges

Google Driverless Car



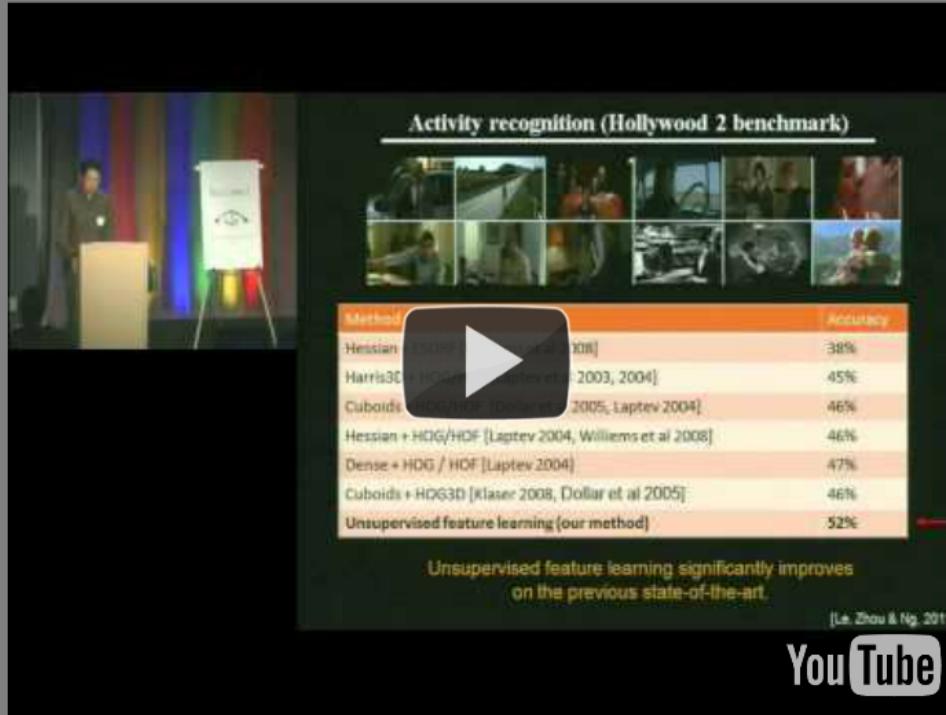
Watson



IBM

Google Brain

Sophisticated Cat Recognition



Andrew Ng

<http://www.nytimes.com/2012/06/26/technology/in-a-big-network-of-computers-evidence-of-machine-learning.html>

http://deeplearning.stanford.edu/wiki/index.php/Main_Page