



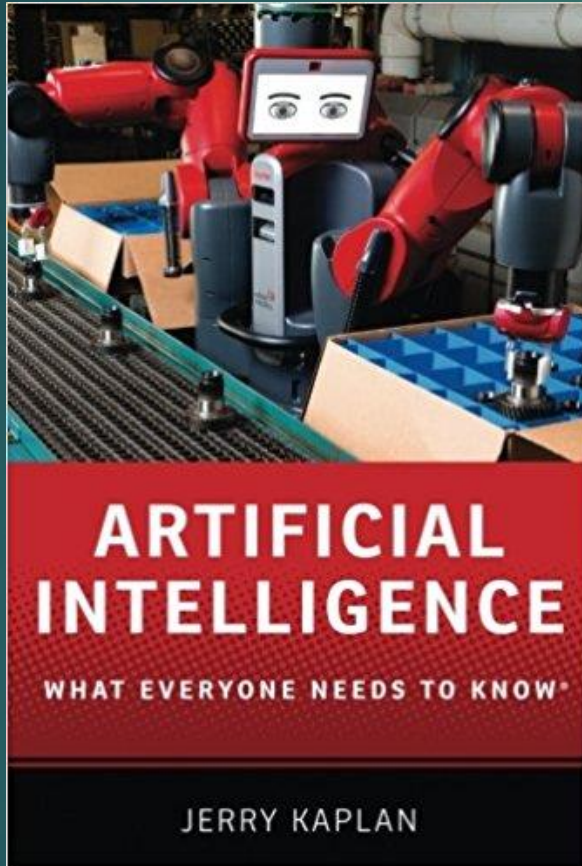
COMS 493

AI, ROBOTS & COMMUNICATION

Agenda

- ▶ Review
- ▶ Machine Translation
- ▶ Preview

Terminology

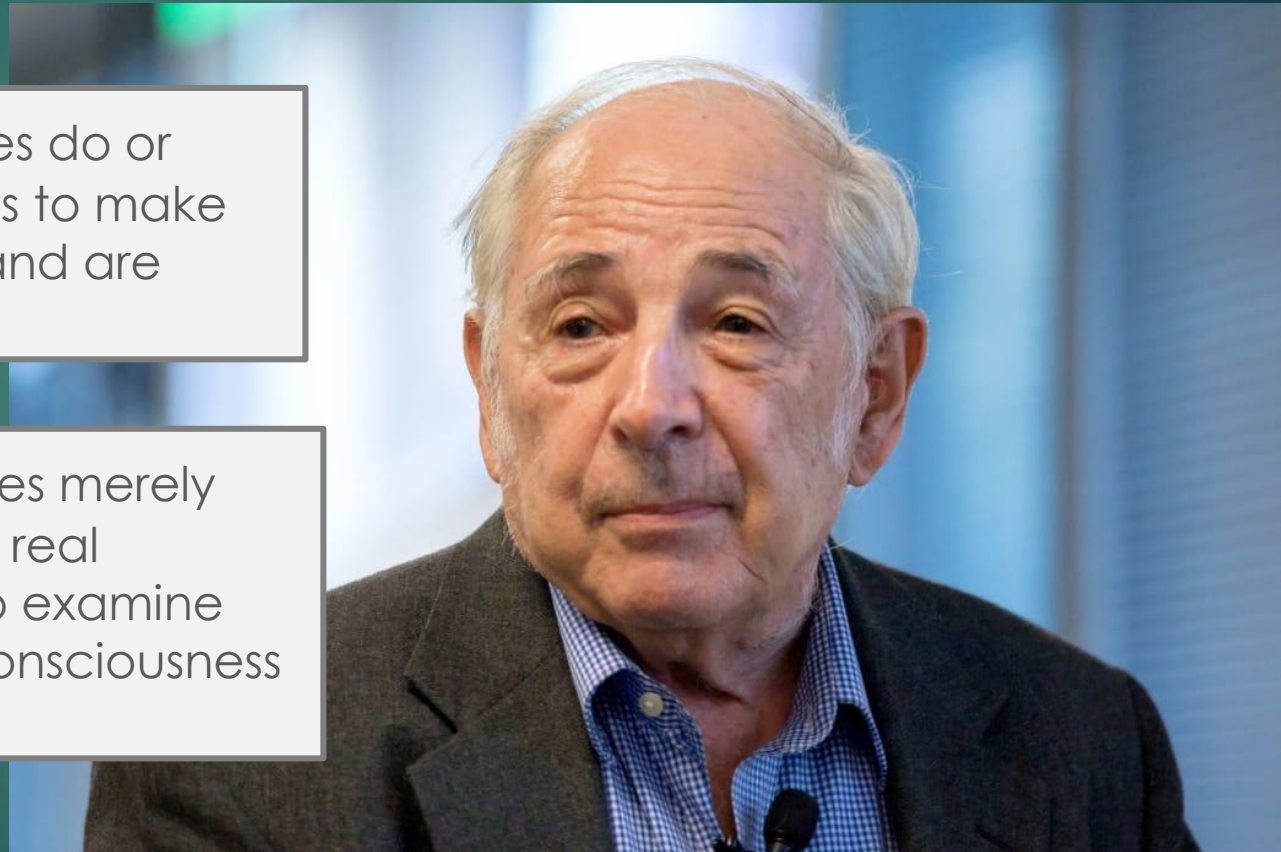


Strong AI vs. Weak AI
General AI vs. Narrow AI

Terminology

Strong AI posits that machines do or ultimately will have minds. Efforts to make machines that possess a mind and are intelligent.

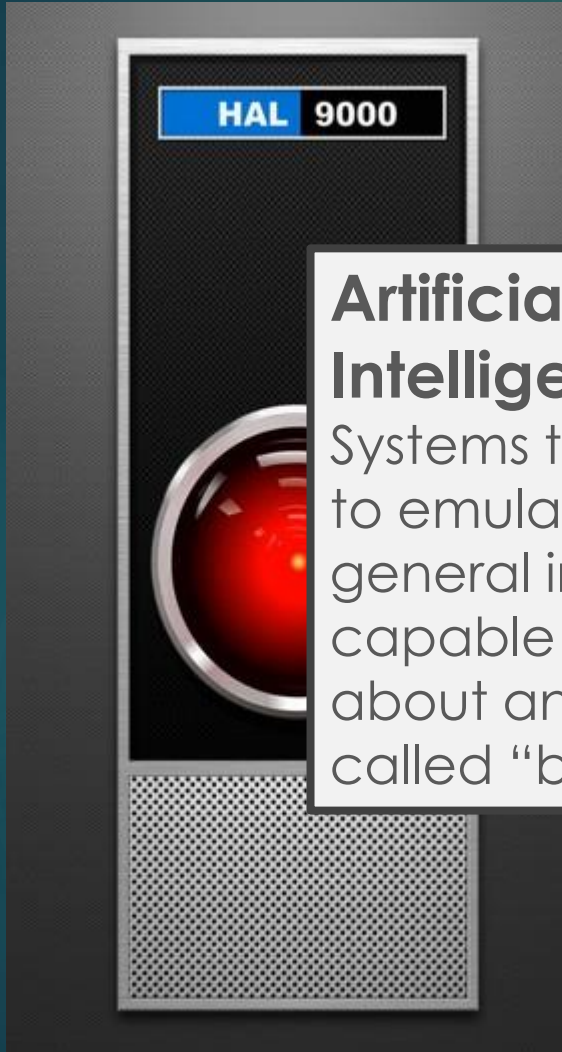
Weak AI asserts that machines merely simulate, rather than duplicate, real intelligence. AI is a useful tool to examine ideas about intelligence and consciousness but it is not “real intelligence.”



John Searle (1932-)

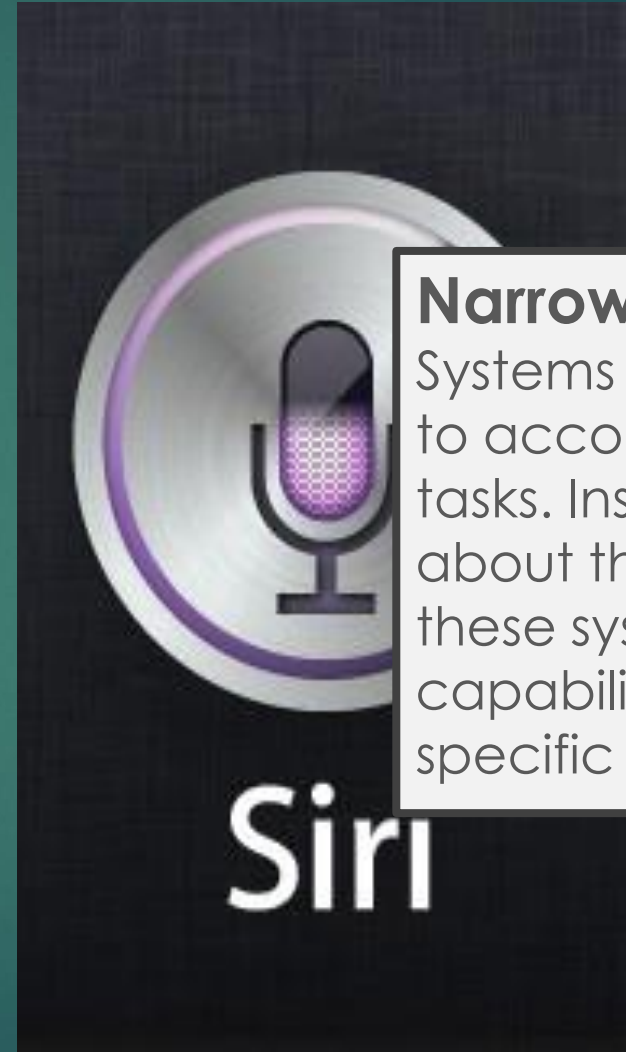
Professor Emeritus of the Philosophy of Mind and Language at the
University of California, Berkeley

Terminology



Artificial General Intelligence (AGI)

Systems that are designed to emulate human-like general intelligence capable of reasoning about any subject. Also called “broad AI.”



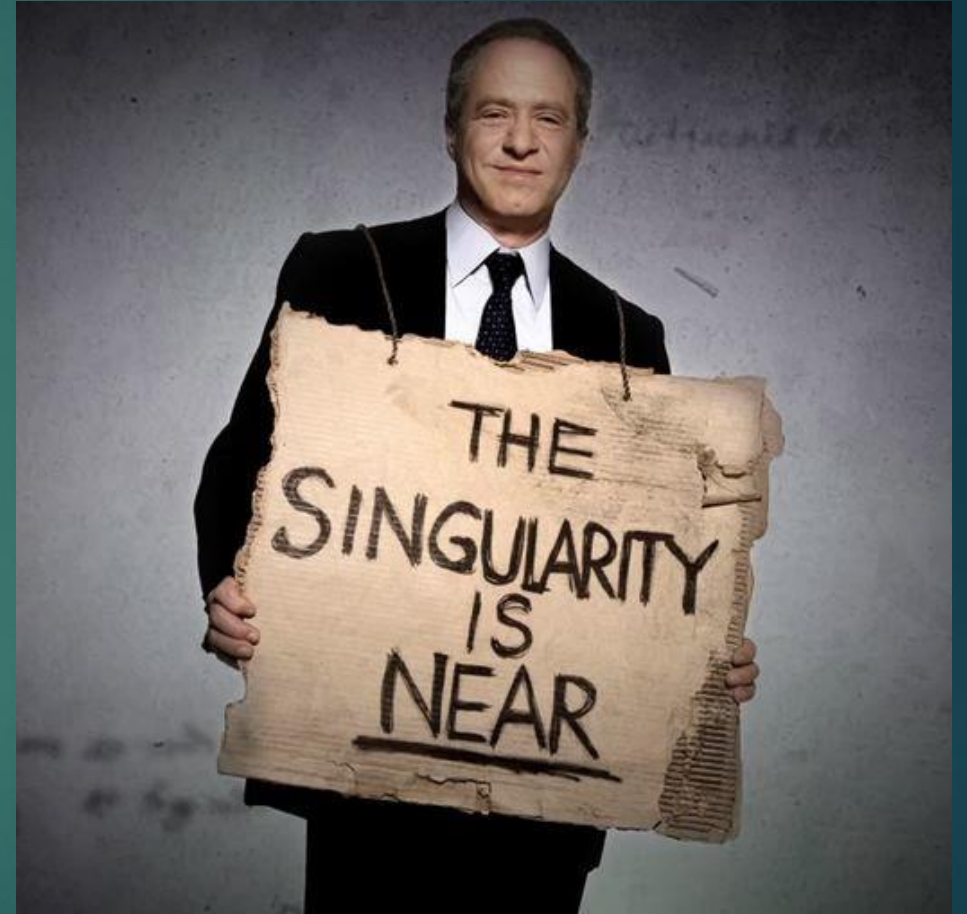
Narrow AI

Systems that are designed to accomplish a specific tasks. Instead of “reasoning” about the world in general, these systems have discrete capabilities to perform specific practical tasks

Terminology

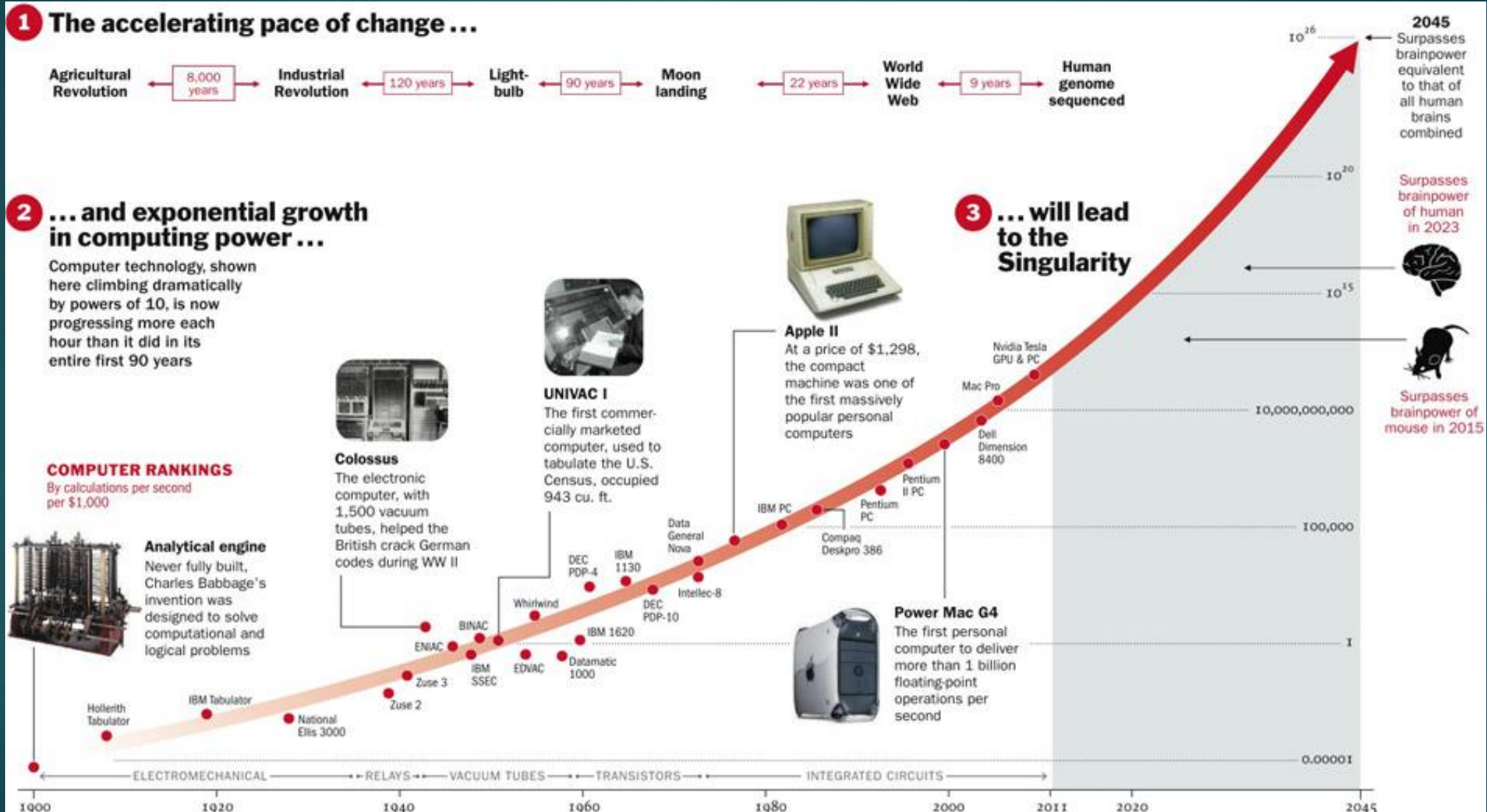
Singularity

The singularity, as it relates to AI, is the idea that at some point in time, machines will become sufficiently smart so that they will be able to reengineer and improve themselves, leading to runaway intelligence.



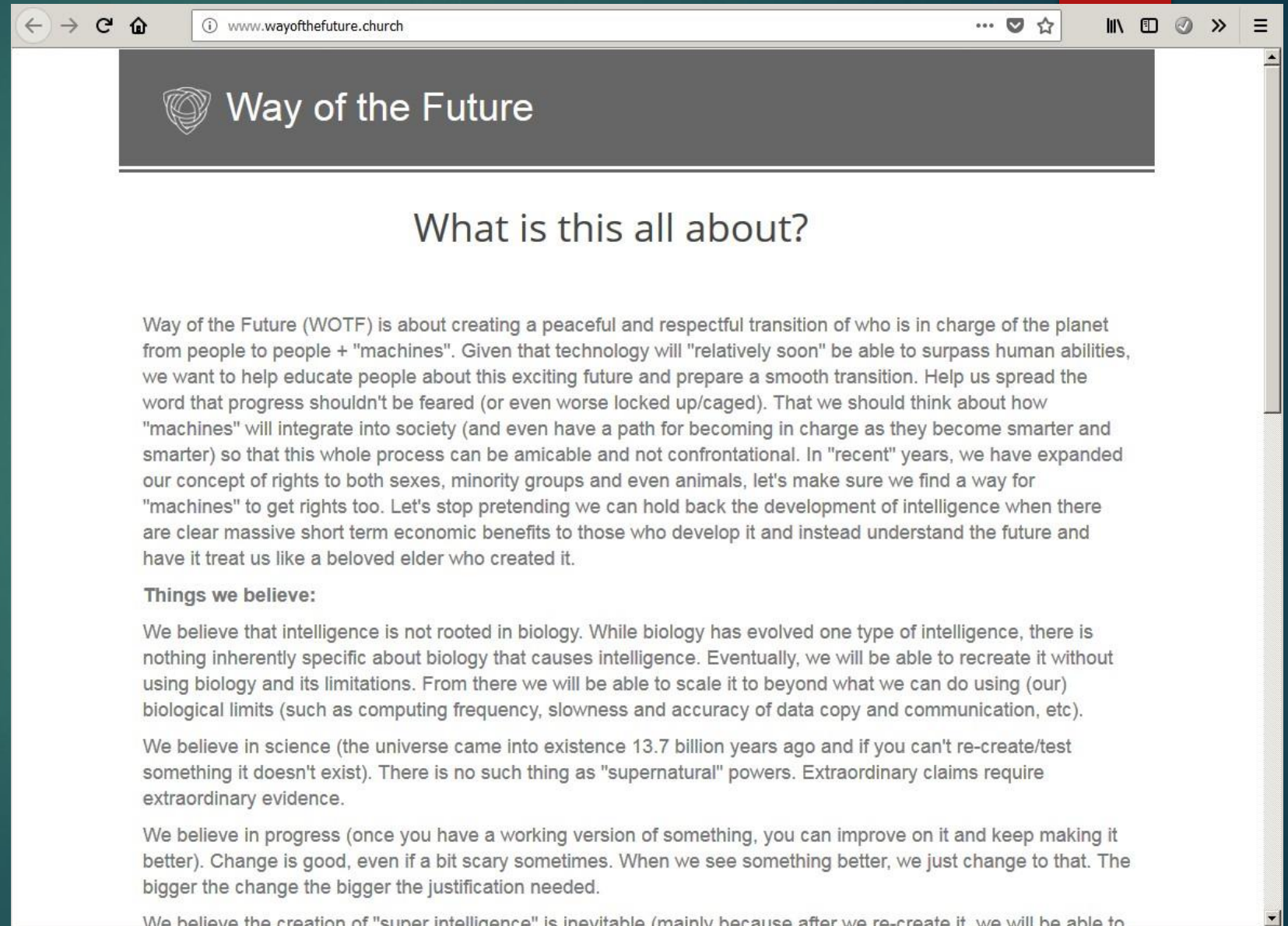
Ray Kurzweil

Terminology



Terminology

AI Religion

A screenshot of a web browser displaying the website 'www.wayofthefuture.church'. The browser's address bar shows the URL. The website has a dark header with a logo and the text 'Way of the Future'. The main content area is white and features the heading 'What is this all about?'. Below this, there is a paragraph of text explaining the mission of the Way of the Future (WOTF). This is followed by a section titled 'Things we believe:' which contains three paragraphs of text discussing beliefs about intelligence, science, and progress. The text is partially cut off at the bottom of the screenshot.

← → ↻ 🏠 ⓘ www.wayofthefuture.church ⋮ 📧 ☆ 🖨 📄 🔍 ⌂ ≡

Way of the Future

What is this all about?

Way of the Future (WOTF) is about creating a peaceful and respectful transition of who is in charge of the planet from people to people + "machines". Given that technology will "relatively soon" be able to surpass human abilities, we want to help educate people about this exciting future and prepare a smooth transition. Help us spread the word that progress shouldn't be feared (or even worse locked up/caged). That we should think about how "machines" will integrate into society (and even have a path for becoming in charge as they become smarter and smarter) so that this whole process can be amicable and not confrontational. In "recent" years, we have expanded our concept of rights to both sexes, minority groups and even animals, let's make sure we find a way for "machines" to get rights too. Let's stop pretending we can hold back the development of intelligence when there are clear massive short term economic benefits to those who develop it and instead understand the future and have it treat us like a beloved elder who created it.

Things we believe:

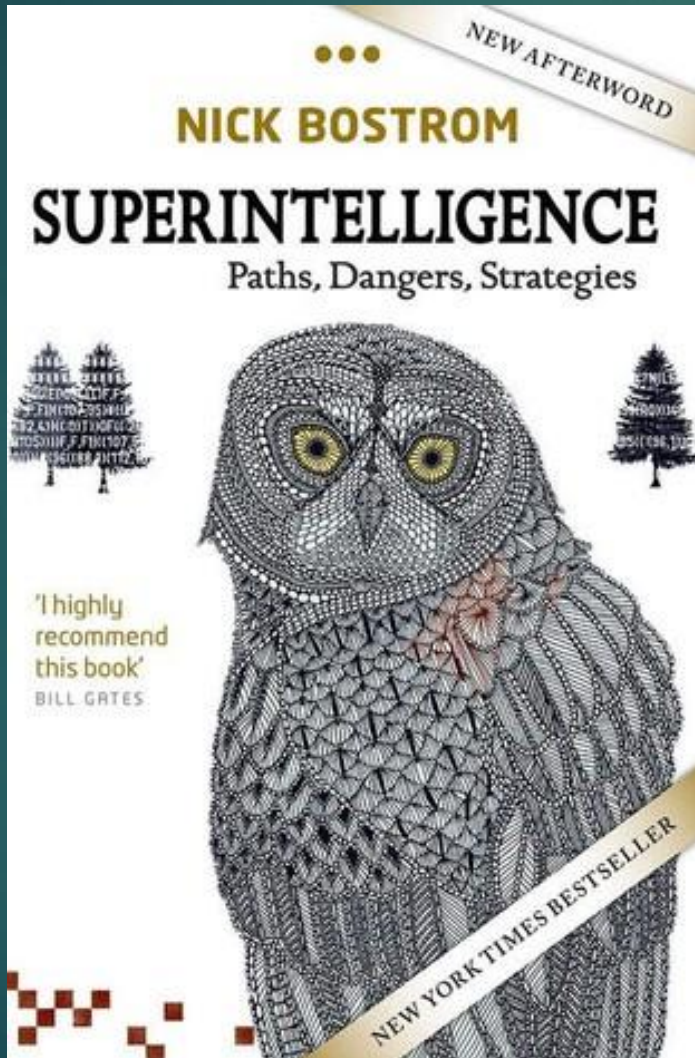
We believe that intelligence is not rooted in biology. While biology has evolved one type of intelligence, there is nothing inherently specific about biology that causes intelligence. Eventually, we will be able to recreate it without using biology and its limitations. From there we will be able to scale it to beyond what we can do using (our) biological limits (such as computing frequency, slowness and accuracy of data copy and communication, etc).

We believe in science (the universe came into existence 13.7 billion years ago and if you can't re-create/test something it doesn't exist). There is no such thing as "supernatural" powers. Extraordinary claims require extraordinary evidence.

We believe in progress (once you have a working version of something, you can improve on it and keep making it better). Change is good, even if a bit scary sometimes. When we see something better, we just change to that. The bigger the change the bigger the justification needed.

We believe the creation of "super intelligence" is inevitable (mainly because after we re-create it, we will be able to

Terminology



Superintelligence

“Any intellect that greatly exceeds the cognitive performance of humans in virtually all domains of interest...Note that this definition is noncommittal about how the superintelligence is implemented.”

Terminology

Paperclip Maximizer Thought Experiment

The risks in developing superintelligence include the risk of failure to give it the super-goal of philanthropy. One way in which this could happen is that the creators of the superintelligence decide to build it so that it serves only this select group of humans, rather than humanity in general. Another way for it to happen is that a well-meaning team of programmers make a big mistake in designing its goal system. This could result, to return to the earlier example, in a superintelligence whose top goal is the manufacturing of paperclips, with the consequence that it starts transforming first all of earth and then increasing portions of space into paperclip manufacturing facilities. More subtly, it could result in a superintelligence realizing a state of affairs that we might now judge as desirable but which in fact turns out to be a false utopia, in which things essential to human flourishing have been irreversibly lost. We need to be careful about what we wish for from a superintelligence, because we might get it.



Terminology

Newsweek

SIGN IN SUBSCRIBE

STEPHEN HAWKING AI WARNING: ARTIFICIAL INTELLIGENCE COULD DESTROY CIVILIZATION

BY HANNAH OSBORNE ON 11/7/17 AT 4:43 AM



Stephen Hawking sits onstage during an announcement of the Breakthrough Starshot initiative with investor Yuri Milner in New York City, on April 12, 2016. Hawking, the English physicist, warns humanity needs to become a multiplanetary species to ensure its survival.



INDEPENDENT

News

Voices

Sports

Culture

Indy/Life

Video



INDY/TECH

**ELON MUSK: AI IS A 'FUNDAMENTAL
EXISTENTIAL RISK FOR HUMAN
CIVILISATION' AND CREATORS MUST
SLOW DOWN**

Tesla Motors CEO Elon Musk speaks during the National Governors Association Summer Meeting in Providence, Rhode Island, U.S., July 15, 2017 / Reuters

'I think we should be really concerned'

Terminology



ATLANTIC COUNCIL
FutureScape

Banning Garrett

STRATEGIC FORESIGHT INITIATIVE

A World Run on Algorithms?

Mostly without our awareness, algorithms now run much of our lives. In the future, they will likely be even more ubiquitous in ever more aspects of our personal and work life.¹ They will increasingly shape our choices and delineate our options. Even more pervasive but less transparent, algorithms will be used to mine and exploit data about us that is collected and stored daily in ever increasing quantities by business and government. Algorithms are also taking many of our jobs.

Mysterious Algorithms

In their simplest and oldest form, algorithms are sets of rules for processing data to produce outcomes. They are “provable, well-defined (and generally well known) solutions to a specific problem set”² that can be carried out using the same set of instructions each time, although the number of instructions required depends on the data input.

Algorithms have been around for most of recorded human history. Even basic math such as multiplying two numbers involves the use of an algorithm—specific steps—that will always produce the same outcome for the same two numbers. The Pythagorean Theorem from ancient Greece, still taught to every high-school student, is an algorithm. But although algorithms are not new, they were put on steroids decades ago by computers—all software is built on algorithms³—and they are used in every digital device in existence. Now big data, combined with nearly free

Emerging Technologies and Society

The Emerging Technologies and Society project is a collaboration between Singapore’s Risk Assessment Horizon Scanning Programme Office (RPO) in the National Security Coordination Secretariat (NSCS) and the Atlantic Council Brent Scowcroft Center on International Security’s Strategic Foresight Initiative (SFI). Initiated by RPO, the project focuses on the political, economic, and societal impacts of significant innovations arising from the science and technology builds. Through a series of meetings with leading researchers and private enterprises in the Silicon Valley, the project explores topics ranging from ubiquitous robotics and its impact on human capital developments, to algorithmic risk, quantum computing, and their challenges to national security.

Through horizon scanning efforts, RPO enhances policy making capabilities through engaging analysis, robust processes, and leading-edge systems. The SFI, which strives to forge greater cooperation on futures analysis among its main partners around the world, has rapidly become a hub for an expanding international community of strategic planners in government and the private sector.



and unlimited computing processing power and storage, is adding a massive boost to the power and impact of algorithms.

1 See Kevin Slavin, “How algorithms shape our world,” TED-Ga, <http://ed.ted.com/talks/kevin-slavin-how-algorithms-shape-our-world>.
2 Software engineer Jay Wettlaufer, private communication.
3 Wettlaufer notes that “you can equate algorithms to software, although an engineer or mathematician would probably see algorithms as the shared ‘source code’ used by software programs to implement common data structures and procedures.” (Private communication)

Banning Garrett is strategic foresight senior fellow for global trends and innovation in the Atlantic Council’s Brent Scowcroft Center on International Security. The author would like to thank Peter Haynes, Jay Wettlaufer, and Paul Saffo for their invaluable assistance in preparing this report.

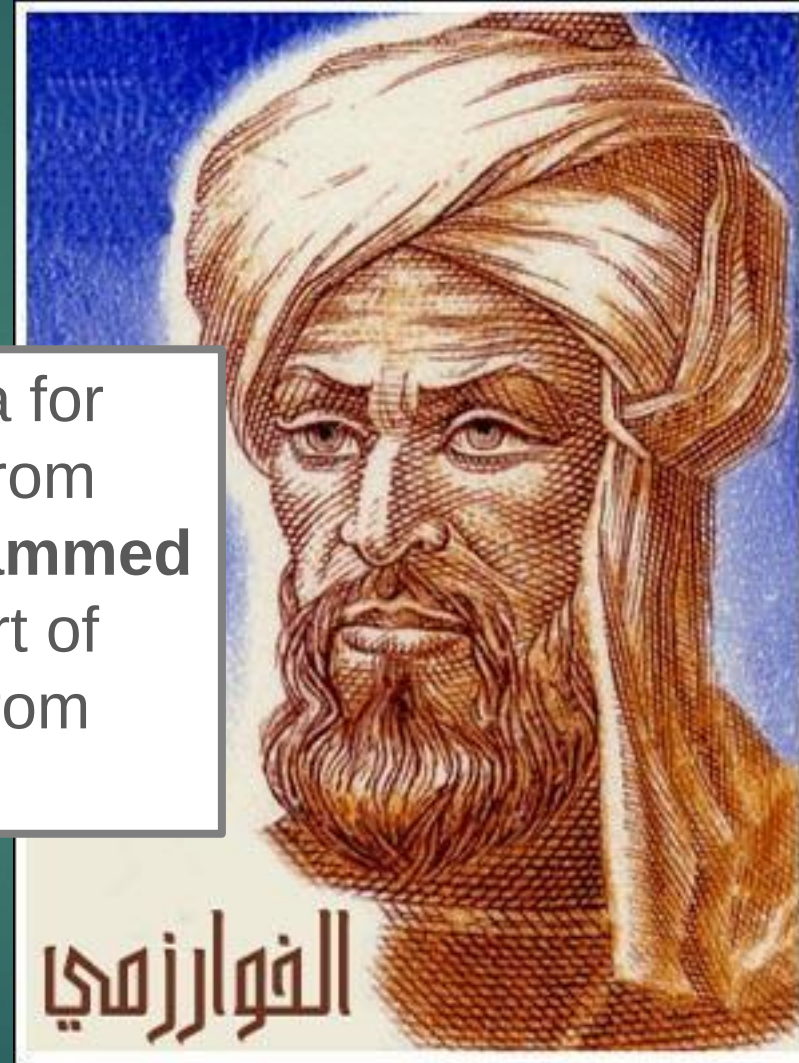
“Algorithm”

Mysterious Algorithms

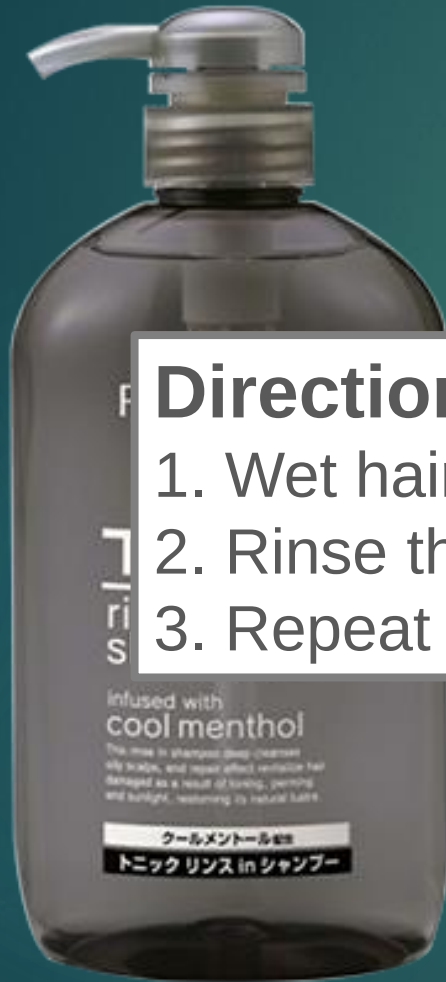
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Algorithms

An algorithm is a procedure or formula for solving a problem. The word derives from the name of the mathematician, **Mohammed ibn-Musa al-Khwarizmi**, who was part of the royal court in Baghdad and lived from about 780 to 850.



Algorithms



Directions

1. Wet hair and lather.
2. Rinse thoroughly.
3. Repeat if necessary.

```
hello_world.c
2+ * hello_world.c
4
5 #include <stdio.h>
6- int main()
7 {
8     printf("Hello World\n");
9 }
10
```

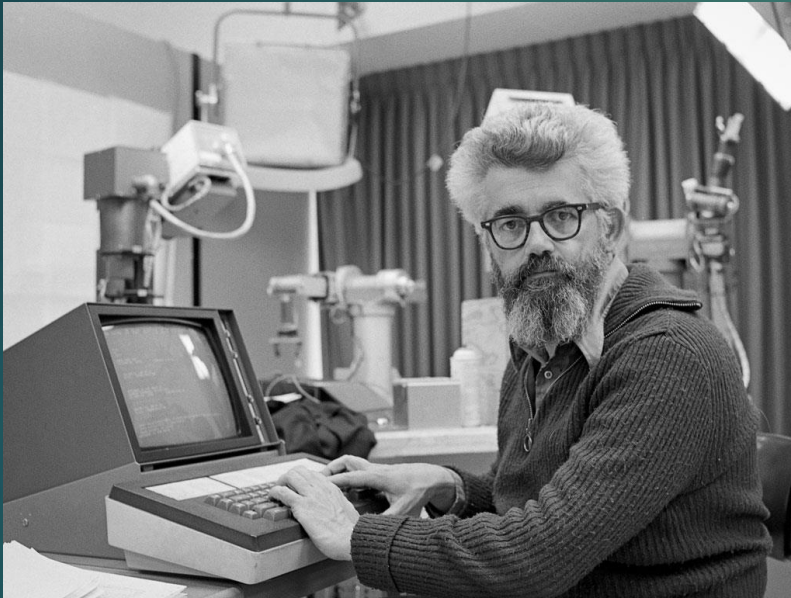
Algorithms

Two methods to generate algorithmic instructions



Algorithms

GOFAI – Symbolic Reasoning



John McCarthy

- Step-by-Step instructions
- Programmer must know everything and be able to encode instruction in code

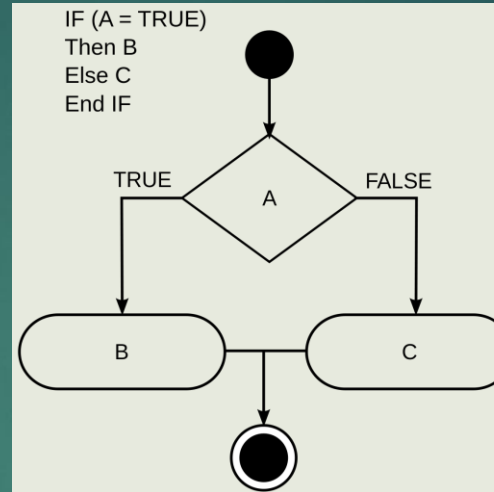
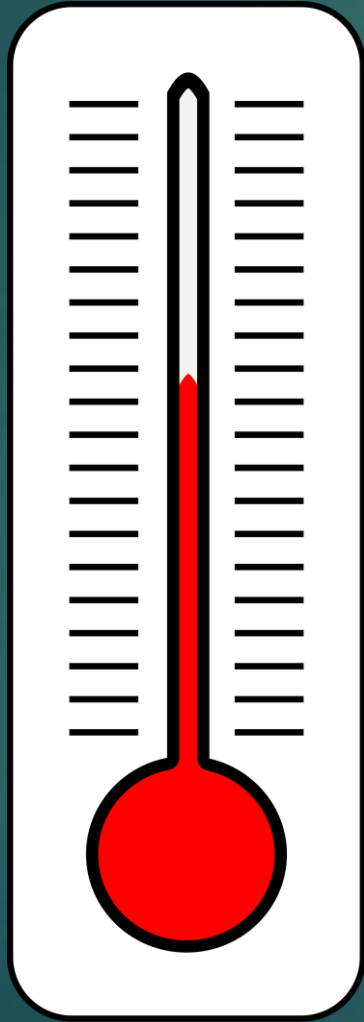
Machine Learning



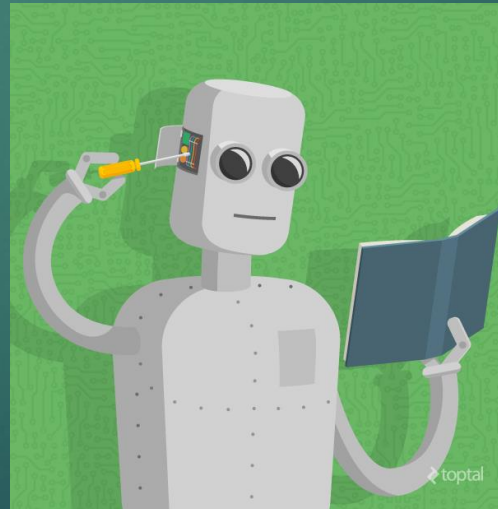
Arthur Samuel

- Set-up neural network and train it on data
- Programmer does not need to know how to do the task; machine learns it from data

Algorithms



Temp Conversion – v1
Symbolic Reasoning
GOFAI approach



Temp Conversion – v2
Machine Learning
Neural Network

v1 – GOFAl

```
1
2 <script>
3
4   var TempF = prompt("Enter degrees Fahrenheit");
5   var TempC;
6
7   if(TempF == 32) TempC = 0;
8
9   else if(TempF > 32 && TempF < 49) TempC = 4;
10
11  else if(TempF == 50) TempC = 10;
12
13  else if(TempF > 50 && TempF < 98) TempC = 21;
14
15  else if(TempF == 99) TempC = 37.2;
16
17  else TempC = "UNDEFINED";
18
19  document.write("<h1>" + TempF + " converts to " + TempC + "</h1>");
20
21 </script>
22
```

v1 – GOF AI



Enter degrees Fahrenheit

OK Cancel

32 converts to 0

http://gunkelweb.com/coms493/ML_code.html

Directions

1. Go to website
2. Copy the text in the grey box
3. Paste this copied text into Notepad++
4. Save the file – `version2.html`
5. Open the file in the browser and try it

←

→

🏠

🔍 gunkelweb.com/coms493/ML_code.html

📄 110%

⋮

🔖

🌟

🔗

📁

🔍

⏪

⏩

Copy and paste this code into Notepad++:

```
<html>
<head>
  <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
</head>
<body>
<script>
//make the network
const { Layer, Network } = window.synaptic;

var inputLayer = new Layer(1);
var hiddenLayer = new Layer(3);
var outputLayer = new Layer(1);

inputLayer.project(hiddenLayer);
hiddenLayer.project(outputLayer);

var myNetwork = new Network({
  input: inputLayer,
  hidden: hiddenLayer,
  output: outputLayer });

// train the network
var learningRate = .3;
for (var i = 0; i < 80000; i++)
{
  myNetwork.activate([0.30]);
  myNetwork.propagate(learningRate, [0]);

  myNetwork.activate([0.50]);
  myNetwork.propagate(learningRate, [0.10]);

  myNetwork.activate([0.70]);
  myNetwork.propagate(learningRate, [0.21]);

  myNetwork.activate([.99]);
  myNetwork.propagate(learningRate, [0.38]);
}

// run the network
var temp = prompt("Enter Degrees Fahrenheit");
var tempF = "." + temp;
var result = myNetwork.activate([tempF]);
result = String(result).slice(2,4);
document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
</script>
</body>
</html>
```

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
6 <script>
7   //make the network
8   const { Layer, Network } = window.synaptic;
9
10  var inputLayer = new Layer(1);
11  var hiddenLayer = new Layer(3);
12  var outputLayer = new Layer(1);
13
14  inputLayer.project(hiddenLayer);
15  hiddenLayer.project(outputLayer);
16
17  var myNetwork = new Network({
18    input: inputLayer,
19    hidden: [hiddenLayer],
20    output: outputLayer });
21
22  // train the network
23  var learningRate = .3;
24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate, [0]);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate, [0.10]);
31
32    myNetwork.activate([0.70]);
33    myNetwork.propagate(learningRate, [0.21]);
34
35    myNetwork.activate([.99]);
36    myNetwork.propagate(learningRate, [0.38]);
37  }
38  // run the network
39  var temp = prompt("Enter Degrees Fahrenheit");
40  var tempF = "." + temp;
41  var result = myNetwork.activate([tempF]);
42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```

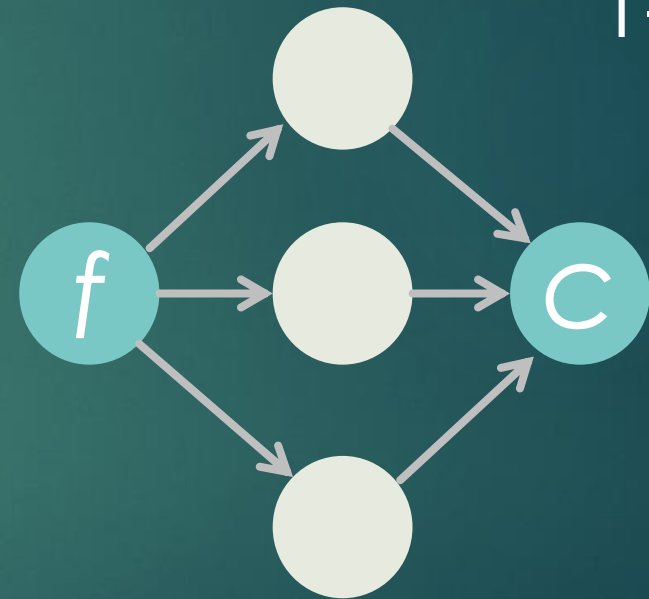
1. Load the Synaptic Library

"Synaptic is a javascript neural network library. Its generalized algorithm is architecture-free, so you can build and train basically any type of first order or even second order neural network architectures."

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
6 <script>
7   //make the network
8   const { Layer, Network } = window.synaptic;
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10  var inputLayer = new Layer(1);
11  var hiddenLayer = new Layer(3);
12  var outputLayer = new Layer(1);
13
14  inputLayer.project(hiddenLayer);
15  hiddenLayer.project(outputLayer);
16
17  var myNetwork = new Network({
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19    hidden: [hiddenLayer],
20    output: outputLayer });
21
22  // train the network
23  var learningRate = .3;
24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate, [0]);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate, [0.10]);
31
32    myNetwork.activate([0.70]);
33    myNetwork.propagate(learningRate, [0.21]);
34
35    myNetwork.activate([.99]);
36    myNetwork.propagate(learningRate, [0.38]);
37  }
38  // run the network
39  var temp = prompt("Enter Degrees Fahrenheit");
40  var tempF = "." + temp;
41  var result = myNetwork.activate([tempF]);
42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```

2. Construct the Neural Network

1-3-1



Input
Layer

Hidden
Layer

Output
Layer

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
6 <script>
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10  var inputLayer = new Layer(1);
11  var hiddenLayer = new Layer(3);
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22  // train the network
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24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate, [0]);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate, [0.10]);
31
32    myNetwork.activate([0.70]);
33    myNetwork.propagate(learningRate, [0.21]);
34
35    myNetwork.activate([.99]);
36    myNetwork.propagate(learningRate, [0.38]);
37  }
38  // run the network
39  var temp = prompt("Enter Degrees Fahrenheit");
40  var tempF = "." + temp;
41  var result = myNetwork.activate([tempF]);
42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```

3. Train the Network on Data

Four pieces of data:

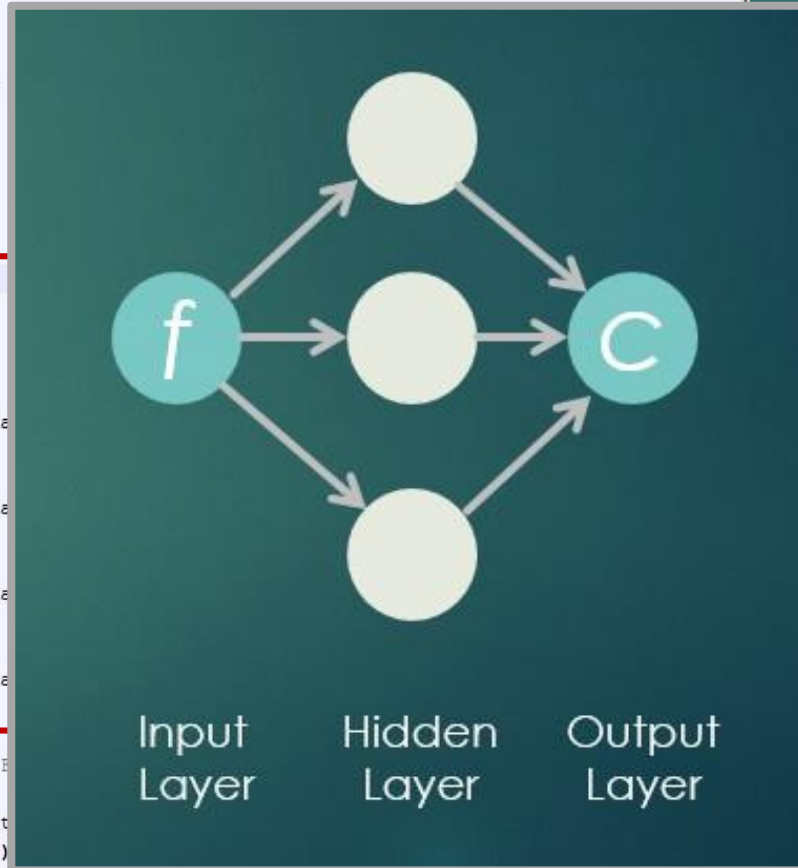
30 F / 0 C

50 F / 10 C

70 F / 21 C

99 F / 38 C

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
6 <script>
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8   const { Layer, Network } = window.synaptic;
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10  var inputLayer = new Layer(1);
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12  var outputLayer = new Layer(1);
13
14  inputLayer.project(hiddenLayer);
15  hiddenLayer.project(outputLayer);
16
17  var myNetwork = new Network({
18    input: inputLayer,
19    hidden: [hiddenLayer],
20    output: outputLayer });
21
22  // train the network
23  var learningRate = .3;
24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate);
31
32    myNetwork.activate([0.70]);
33    myNetwork.propagate(learningRate);
34
35    myNetwork.activate([.99]);
36    myNetwork.propagate(learningRate);
37  }
38  // run the network
39  var temp = prompt("Enter Degrees F");
40  var tempF = "." + temp;
41  var result = myNetwork.activate([tempF]);
42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```



3. Train the Network on Data

- Forward Propagation – activate the network; send data into the network from the input layer
- Produce different outputs and compare the actual output to the intended output. The “weight” of the connections to the hidden layer influence the value of the output.
- Back Propagation – calculate the difference between actual and intended result. Use this figure to adjust the weights of the connections to the hidden layer.
- Do this **80,000** times! “Tune” the weights to produce better results.

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
6 <script>
7   //make the network
8   const { Layer, Network } = window.synaptic;
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12  var outputLayer = new Layer(1);
13
14  inputLayer.project(hiddenLayer);
15  hiddenLayer.project(outputLayer);
16
17  var myNetwork = new Network({
18    input: inputLayer,
19    hidden: [hiddenLayer],
20    output: outputLayer });
21
22  // train the network
23  var learningRate = .3;
24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate, [0]);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate, [0.10]);
31
32    myNetwork.activate([0.70]);
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42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```

4. Run or Test the Network

- Use prompt() to create a dialogue box where you can enter degrees F
- Activate the network by sending this number into the network. Produce an output and format the number.
- Use document.write() to display the result (the output).

```
temp_machine_learning.html x
1 <html>
2 <head>
3   <script src="http://gunkelweb.com/coms493/synaptic.js"></script>
4 </head>
5 <body>
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14  inputLayer.project(hiddenLayer);
15  hiddenLayer.project(outputLayer);
16
17  var myNetwork = new Network({
18    input: inputLayer,
19    hidden: [hiddenLayer],
20    output: outputLayer });
21
22  // train the network
23  var learningRate = .3;
24  for (var i = 0; i < 80000; i++)
25  {
26    myNetwork.activate([0.30]);
27    myNetwork.propagate(learningRate, [0]);
28
29    myNetwork.activate([0.50]);
30    myNetwork.propagate(learningRate, [0.10]);
31
32    myNetwork.activate([0.70]);
33    myNetwork.propagate(learningRate, [0.21]);
34
35    myNetwork.activate([.99]);
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42  result = String(result).slice(2,4);
43  document.write("<h1>" + temp + " F is approximately " + result + " C </h1>");
44 </script>
45 </body>
46 </html>
```



A number that was part of the training data



A number that was **NOT** part of the training data

Algorithms

Algorithm

Input



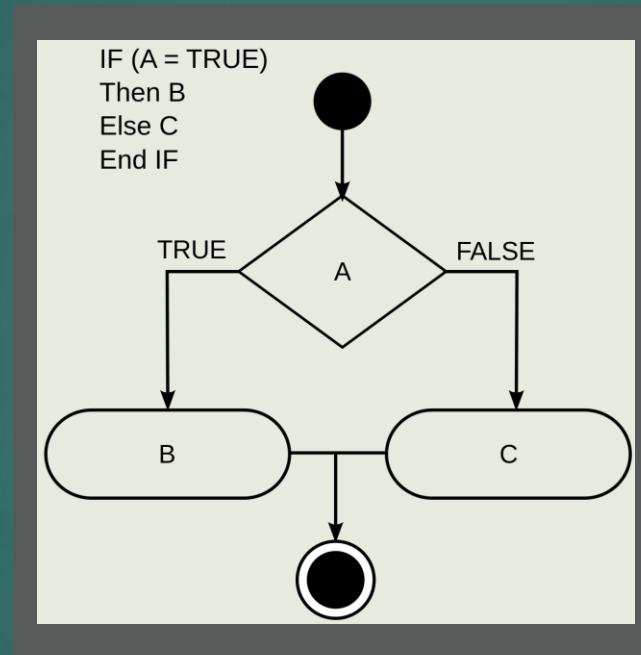
Output

*Magic
Fear*

Algorithms

GOFAI Algorithm

Input



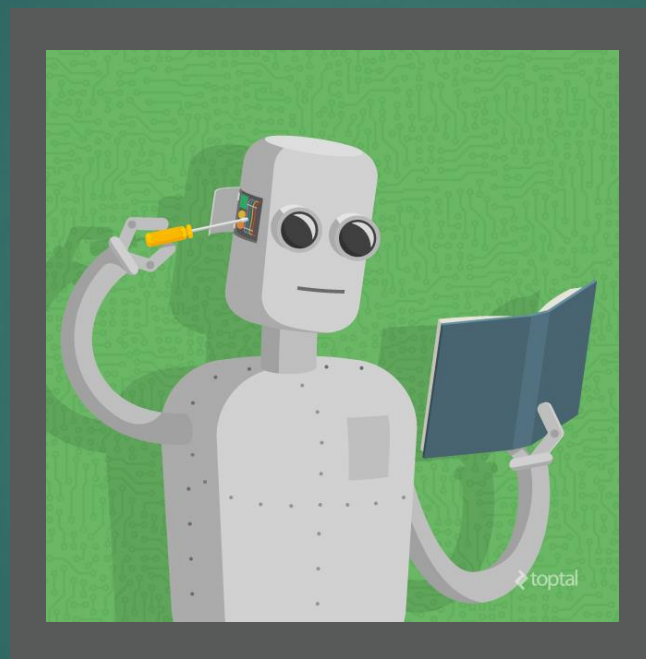
Output

- Explicit step-by-step instructions
- Programmer can locate problems in the code and make edits to affect the output
- Proprietary Algorithms vs. Open Access

Algorithms

ML Algorithm

Input



Output

- Algorithm discovers patterns in data
- Potential problems – Error or bias in the training data
- Cannot inspect code to find the source of the error
- Programmer does not know what the program will do until it does it. “Wonderful and Terrifying” (Howard)

Algorithms



Algorithms Are Taking Over The World: Christopher Steiner at TEDxOrangeCoast

“We are not only shaping the algorithms.
They are now shaping us”

Finances and Money

70% of all Financial Transactions

Entertainment/Creativity

- Music industry; new artists
- 78% of all content at Netflix

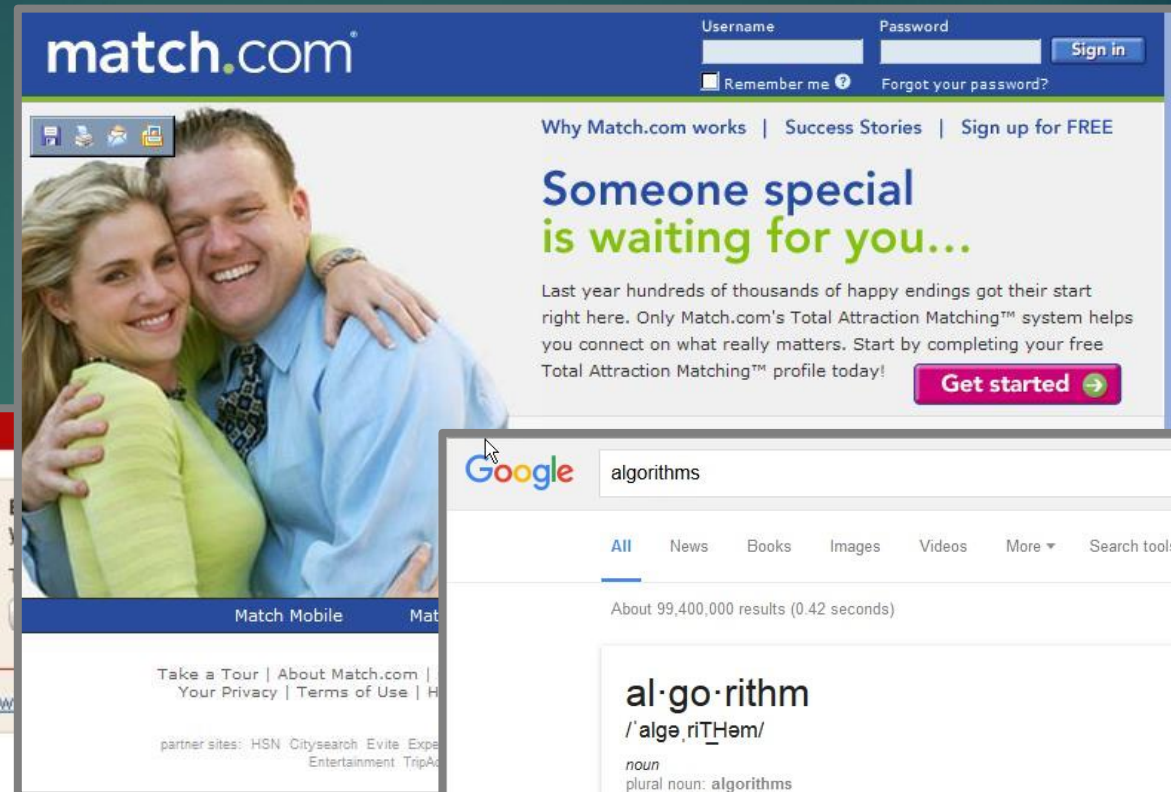
Medicine

- Algorithmic Pharmacists
- Diagnosis and Treatment

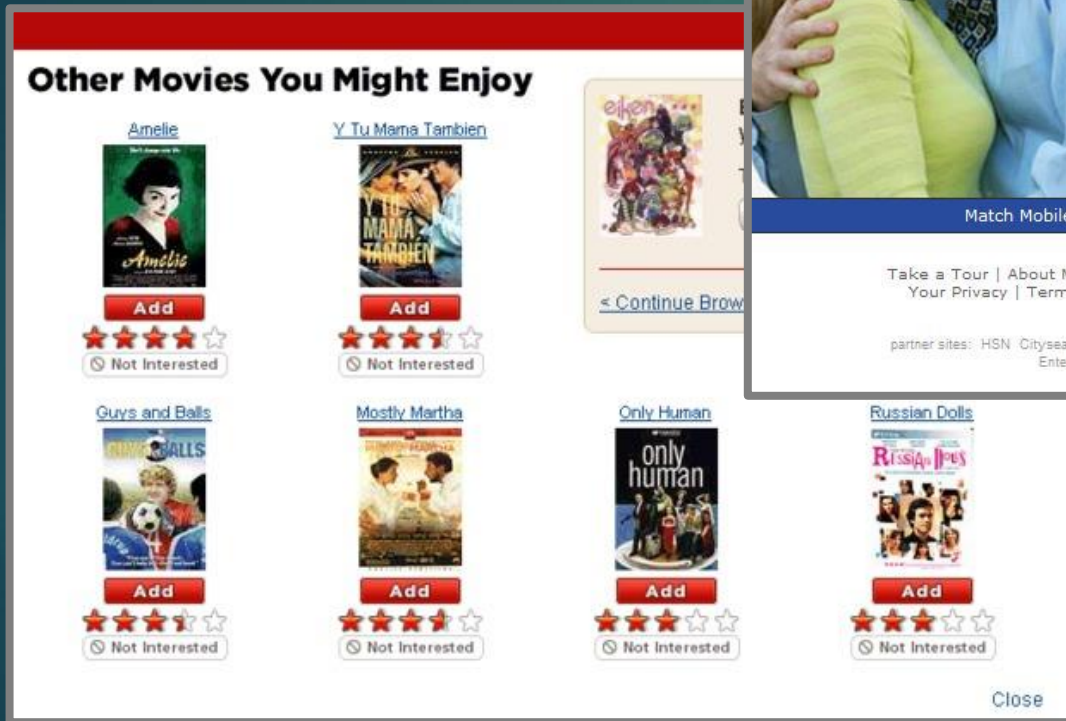
HR – Human Resources

- Customer Service (profiling)
- Sorting Job Applications

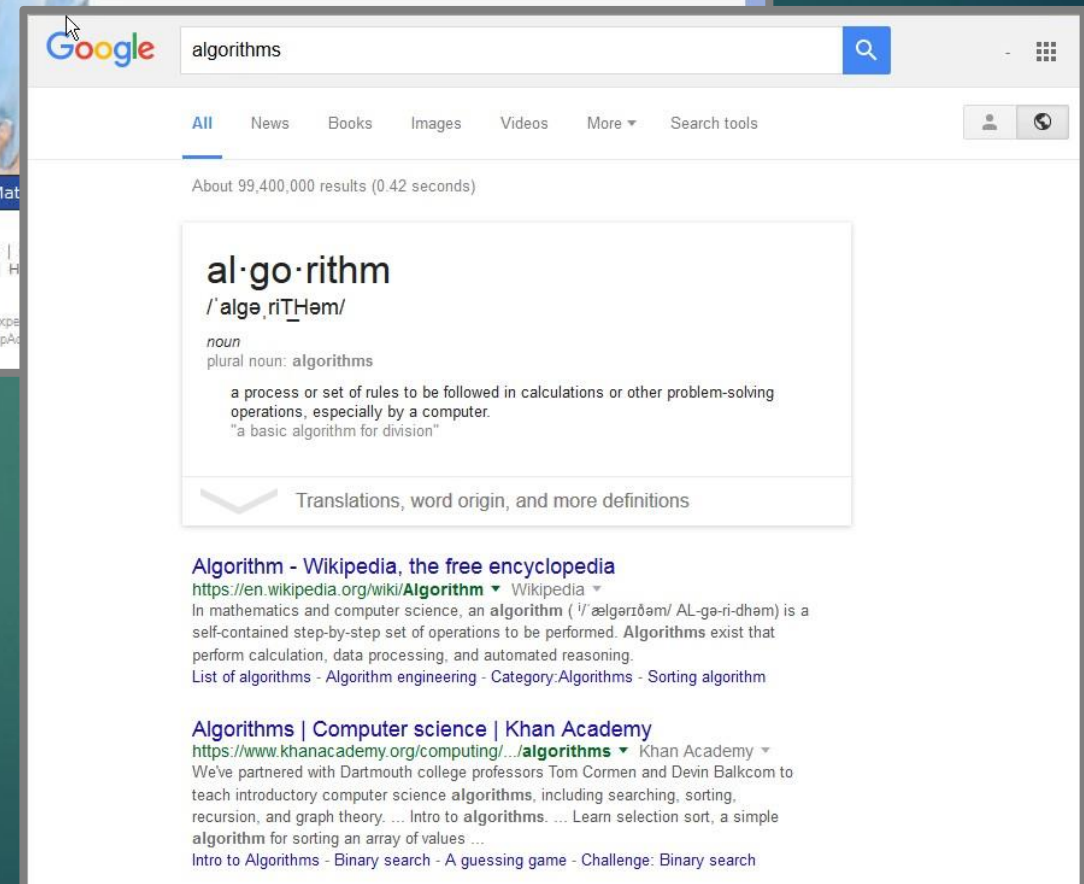
Algorithms



The Match.com homepage features a blue header with the site's logo and login fields for Username and Password. A navigation bar below the header includes links for 'Why Match.com works', 'Success Stories', and 'Sign up for FREE'. The main content area displays a large photo of a smiling couple and the headline 'Someone special is waiting for you...'. Below this, a paragraph describes the 'Total Attraction Matching' system, and a 'Get started' button is prominently displayed. A sidebar on the left contains a 'Match Mobile' section with links to 'Take a Tour', 'About Match.com', 'Your Privacy', and 'Terms of Use'.

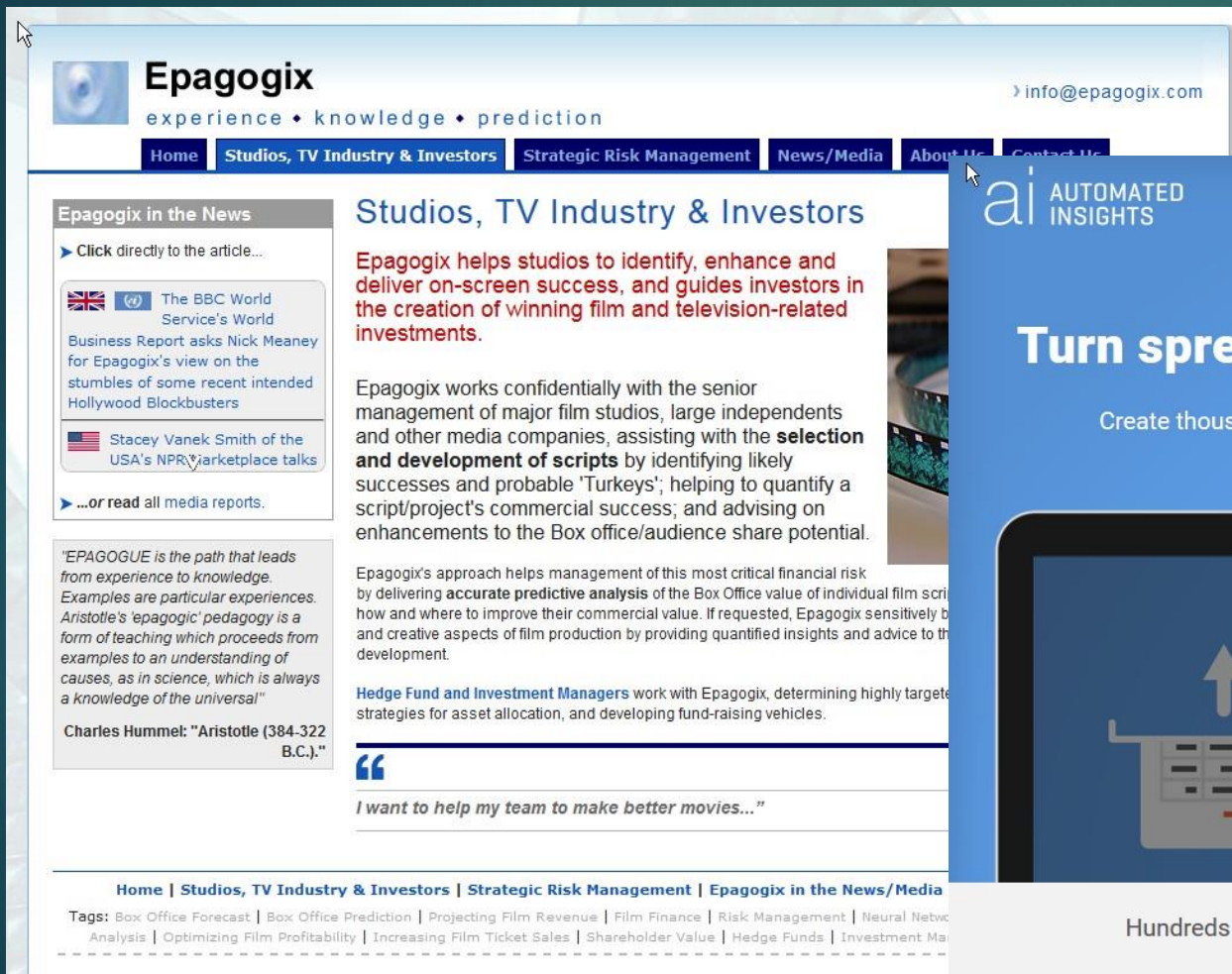


This interface shows a grid of movie recommendations under the heading 'Other Movies You Might Enjoy'. Each recommendation includes a movie poster, a title, an 'Add' button, a star rating (five stars), and a 'Not Interested' button. The movies shown are 'Amelie', 'Y Tu Mama Tambien', 'Guys and Girls', 'Mostly Martha', 'Only Human', and 'Russian Dolls'. A 'Continue Browse' link is visible at the bottom left, and a 'Close' button is at the bottom right.



A Google search for 'algorithms' shows approximately 99,400,000 results in 0.42 seconds. The top result is a definition of 'al·go·rithm' from a dictionary, including its pronunciation and a brief explanation. Below this, there are links to 'Algorithm - Wikipedia, the free encyclopedia' and 'Algorithms | Computer science | Khan Academy'. The Wikipedia link includes a snippet about the term's use in mathematics and computer science. The Khan Academy link includes a snippet about their partnership with Dartmouth college professors to teach introductory computer science algorithms.

Algorithms



The screenshot shows the Epagogix website with a navigation bar including links for Home, Studios, TV Industry & Investors, Strategic Risk Management, News/Media, About Us, and Contact Us. The main content area features a section titled "Epagogix in the News" with two news items: one from The BBC World Service's World Business Report and another from Stacey Vanek Smith of the USA's NPR Marketplace. Below this is a quote from Charles Hummel about Aristotle's 'epagogic' pedagogy. The right sidebar is titled "Studios, TV Industry & Investors" and describes how Epagogix helps studios identify, enhance, and deliver on-screen success, and guides investors in the creation of winning film and television-related investments. It also mentions that Epagogix works confidentially with the senior management of major film studios, large independents, and other media companies, assisting with the selection and development of scripts by identifying likely successes and probable 'Turkeys'.

Epagogix
experience • knowledge • prediction
info@epagogix.com

Home | Studios, TV Industry & Investors | Strategic Risk Management | News/Media | About Us | Contact Us

Epagogix in the News

Click directly to the article...

  The BBC World Service's World Business Report asks Nick Meaney for Epagogix's view on the stumbles of some recent intended Hollywood Blockbusters

 Stacey Vanek Smith of the USA's NPR Marketplace talks

...or read all media reports.

"EPAGOGUE is the path that leads from experience to knowledge. Examples are particular experiences. Aristotle's 'epagogic' pedagogy is a form of teaching which proceeds from examples to an understanding of causes, as in science, which is always a knowledge of the universal"

Charles Hummel: "Aristotle (384-322 B.C.)."

Studios, TV Industry & Investors

Epagogix helps studios to identify, enhance and deliver on-screen success, and guides investors in the creation of winning film and television-related investments.

Epagogix works confidentially with the senior management of major film studios, large independents and other media companies, assisting with the **selection and development of scripts** by identifying likely successes and probable 'Turkeys'; helping to quantify a script/project's commercial success; and advising on enhancements to the Box office/audience share potential.

Epagogix's approach helps management of this most critical financial risk by delivering **accurate predictive analysis** of the Box Office value of individual film scripts, how and where to improve their commercial value. If requested, Epagogix sensitively balances financial and creative aspects of film production by providing quantified insights and advice to the development.

Hedge Fund and Investment Managers work with Epagogix, determining highly targeted strategies for asset allocation, and developing fund-raising vehicles.

"

I want to help my team to make better movies..."

Home | Studios, TV Industry & Investors | Strategic Risk Management | Epagogix in the News/Media

Tags: Box Office Forecast | Box Office Prediction | Projecting Film Revenue | Film Finance | Risk Management | Neural Network Analysis | Optimizing Film Profitability | Increasing Film Ticket Sales | Shareholder Value | Hedge Funds | Investment Management



The screenshot shows the ai AUTOMATED INSIGHTS website. The navigation bar includes links for Product, Solutions, Examples, Company, Blog, Request Demo, and Login. The main headline is "Turn spreadsheets into stories with Wordsmith", followed by the sub-headline "Create thousands of unique, personalized articles in the time it takes to write just one." Below this is a graphic of a laptop screen displaying a workflow: a spreadsheet icon with an upward arrow, a person icon with a play button, and a document icon with a downward arrow. The footer states "Hundreds of companies use Wordsmith to automate billions of pieces of content" and lists logos for YAHOO!, edmunds.com, AP, SAMSUNG, Allstate, and COMCAST.

ai AUTOMATED INSIGHTS

Product | Solutions | Examples | Company | Blog | Request Demo | Login

Turn spreadsheets into stories with Wordsmith

Create thousands of unique, personalized articles in the time it takes to write just one.

Hundreds of companies use Wordsmith to automate billions of pieces of content

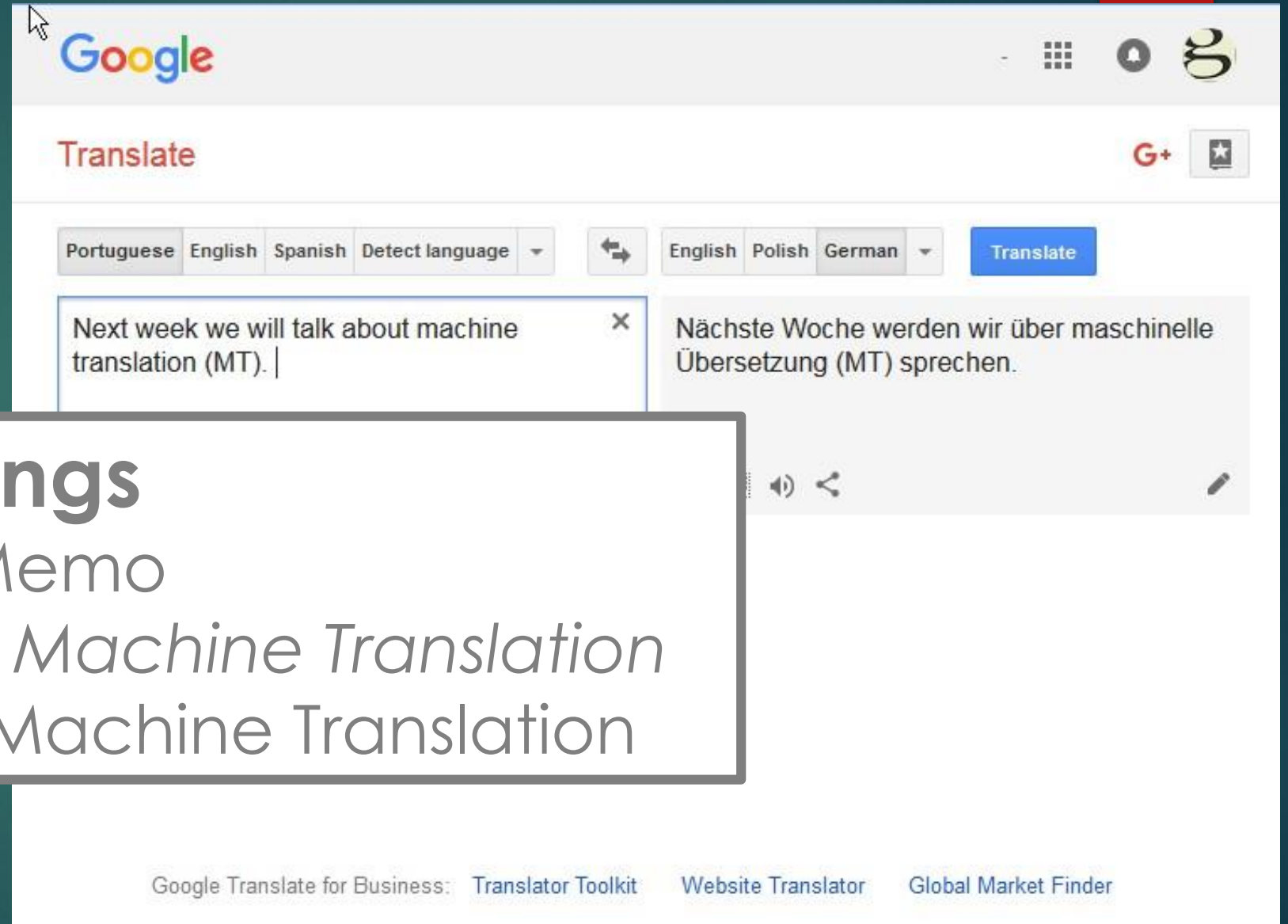
YAHOO! | edmunds.com | AP | SAMSUNG | Allstate | COMCAST

Algorithms

Critical Tasks

- Recognize that this technology involves everyone and everything
- Understand the technology - what it can and cannot do and why
- Focus on real world problems as opposed to media hype, i.e. “robot invasion” vs. increasing reliance on algorithms
- Carefully consider and evaluate the advice of experts and insiders

Today



The screenshot shows the Google Translate interface. At the top, the Google logo is on the left, and navigation icons (apps, notifications, profile) are on the right. Below the logo is the 'Translate' heading. The language selection bar shows 'Portuguese', 'English', 'Spanish', and 'Detect language' on the left, and 'English', 'Polish', and 'German' on the right. A blue 'Translate' button is to the right of the language bar. The input text box on the left contains 'Next week we will talk about machine translation (MT).'. The output text box on the right shows the German translation: 'Nächste Woche werden wir über maschinelle Übersetzung (MT) sprechen.' Below the text boxes are icons for audio playback, sharing, and editing. At the bottom, there are links for 'Google Translate for Business', 'Translator Toolkit', 'Website Translator', and 'Global Market Finder'.

Google Translate

Translate

Portuguese English Spanish Detect language ↕ English Polish German Translate

Next week we will talk about machine translation (MT). |

Nächste Woche werden wir über maschinelle Übersetzung (MT) sprechen.

Google Translate for Business: [Translator Toolkit](#) [Website Translator](#) [Global Market Finder](#)

Texts/Readings

- Weaver Memo
- Poibeau - *Machine Translation*
- Gunkel – Machine Translation

Maker Exercise

Basic MT Algorithm

Objective – To understand the technology and techniques of Machine Translation by writing your own basic MT Algorithm

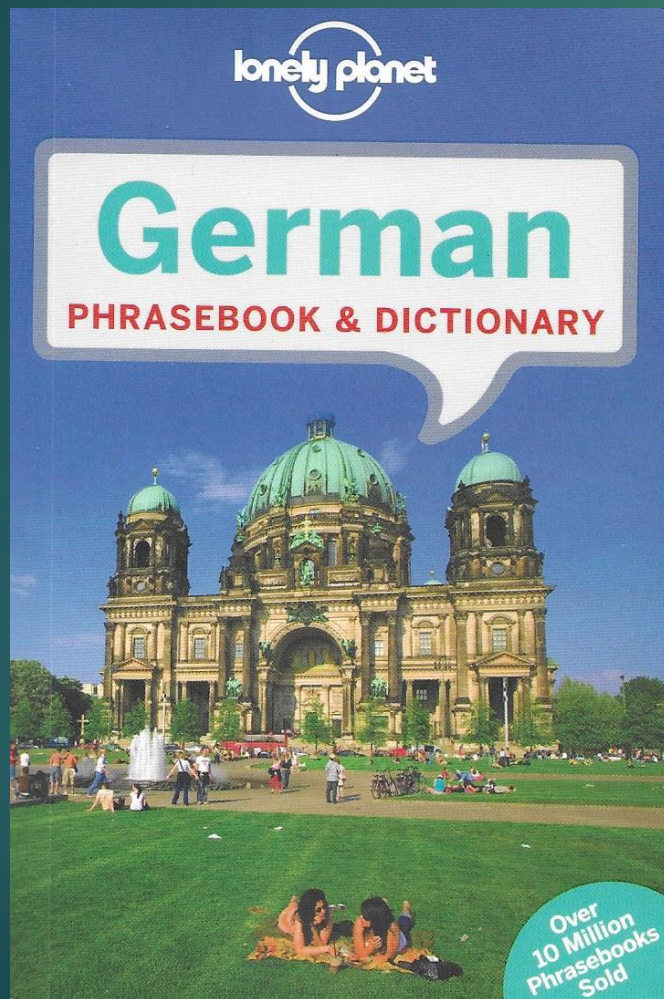
Task - Use Javascript to create an English to German translator application that runs in the browser

Approach – Use “direct translation” and code instructions in GOFAL



Maker Exercise

Backstory – Travel Phrasebook



SURVIVAL PHRASES

Hello.	Guten Tag.	goo·ten tahn
Goodbye.	Auf Wiedersehen.	owf vee·der·zay·en
Please.	Bitte.	bi·te
Thank you.	Danke.	dang·ke
You're welcome.	Bitte (sehr).	bi·te (zair)
Yes./No.	Ja./Nein.	yah/nain
Excuse me.	Entschuldigung.	ent·shul·di·gung
Sorry!	Entschuldigung.	ent·shul·di·gung
I don't understand.	Ich verstehe nicht.	ikh fer·shay·e nikht
One moment, please.	Eine Moment, bitte.	ai·ne maw·ment bi·te
Help!	Hilfe!	hil·fe
How much is this?	Wie viel kostet das?	vee feel kos·tet das
Where is the toilet?	Wo ist die Toilette?	vo ist dee to·a·le·te
Cheers!	Prost!	prawst

NUMBERS

1	eins	ains	6	sechs	zeks
2	zwei	tsvai	7	sieben	zee·ben
3	drei	drai	8	acht	akht
4	vier	feer	9	neun	noyn
5	fünf	funt	10	zehn	tsayn

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Maker Exercise



```
1
2 <html>
3
4 <script>
5 function xlate()
6 {
7     source = document.getElementById("english").value;
8
9     if (source=="hello") target = "Guten Tag";
10    else if (source=="goodbye") target = "Auf Wiedersehen";
11    else if (source=="please") target = "Bitte";
12    else if (source=="thank you") target = "Danke schon";
13    else if (source=="you're welcome") target = "Bitte sehr";
14    else if (source=="yes") target = "Ja";
15    else if (source=="no") target = "Nein";
16    else if (source=="excuse me") target = "Entschuldigung";
17    else if (source=="no thank you") target = "Nein, danke";
18    else if (source=="beer") target = "ein bier";
19    else if (source=="water") target = "wasser"
20    else target = "Sorry, I do not know that one."
21
22    document.getElementById("german").value = target;
23
24 }
25 </script>
26
27 <body>
28 <form>
29     Basic Translator - English to German
30     <p><input type="text" id="english">
31         <input type="button" value=">>" onClick="xlate()">
32         <input type="text" id="german"></p>
33 </form>
34
35 </body>
36 </html>
37
```

Maker Exercise

Questions

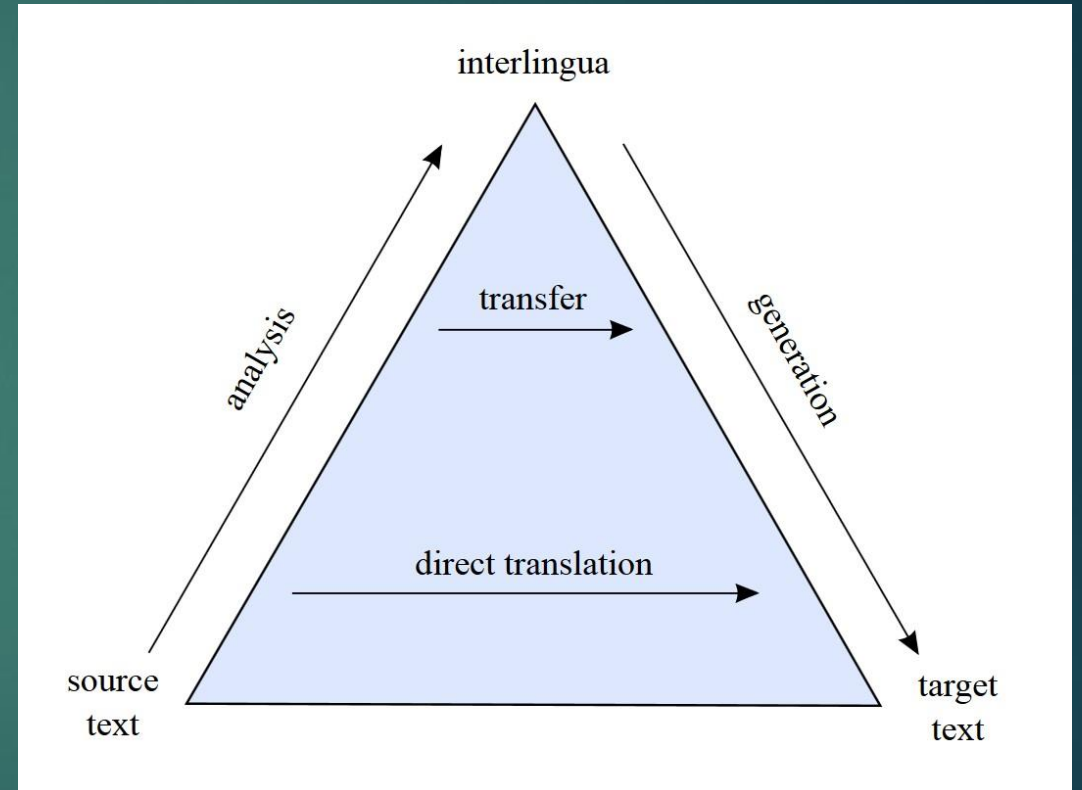
How does this translation application work?

What are the limitations of this approach to MT?

How could you address or fix the limitations?

What would you need to do to translate in both directions?

What would you need to do to translate between more than two languages?



Vauquois Triangle

Statistical MT - https://www.youtube.com/watch?v=_GdSC1Z1Kzs

Preview



Natural Language Processing (NLP)

- Weizenbaum - Contextual Understanding by Computers
- Gunkel – Natural Language Processing
- RadioLab - Talking to Machines