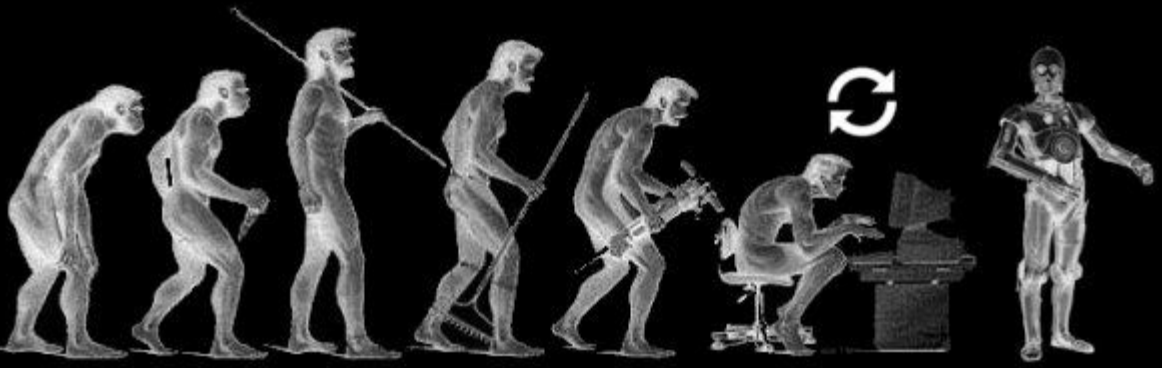
AI4ALL

Davood Shamsi

Meeting 2, Jan 29, 2018



History of AI

Turing Test

Can Machines Think?

Thinking: If machine can have a reasonable conversation with a human, and it is indistinguishable from a human.

Dartmouth Conference 1956

"every aspect of learning or any other feature of intelligence can be so precisely described that a machine can be made to simulate it"

Rise of AI and Optimism 1956–1974

Reasoning as search

"In from three to eight years we will have a machine with the general intelligence of an average human being." 1970, Marvin Minsky

AI Winter, the first one

Problems

- Computational Power
- NP hard formulation
- Data

Boom 1980–1987

The rise of expert systems: rule based

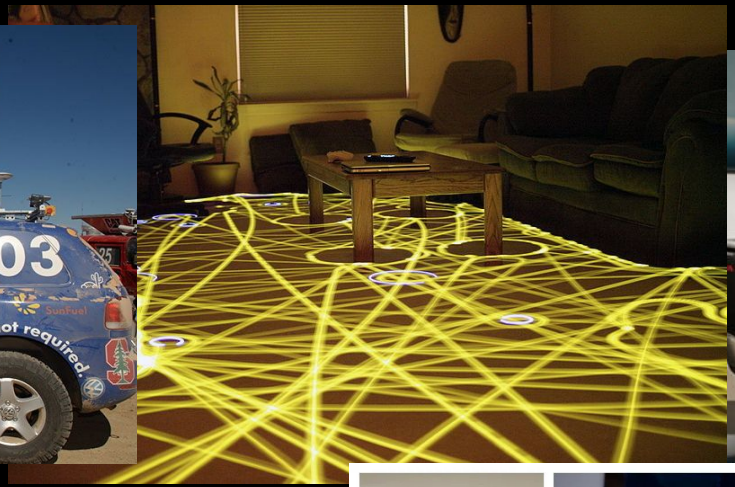
The knowledge revolution:

The fifth generation project: $850M, build machines that could carry on conversations, translate languages, interpret pictures, and reason like human beings

AI Winter, the second one 1987–1993

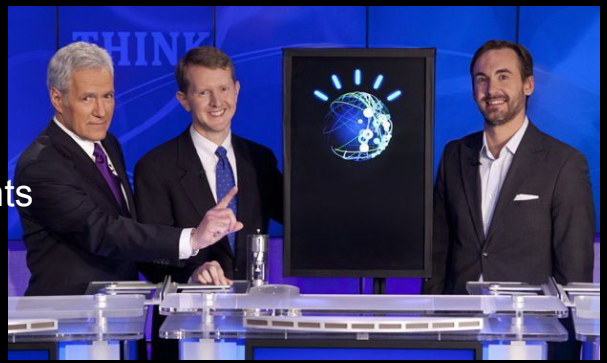
Funding cuts due to disappointments

Stanford Self-driving car



Rumba, 2003

ASIMO, 2000



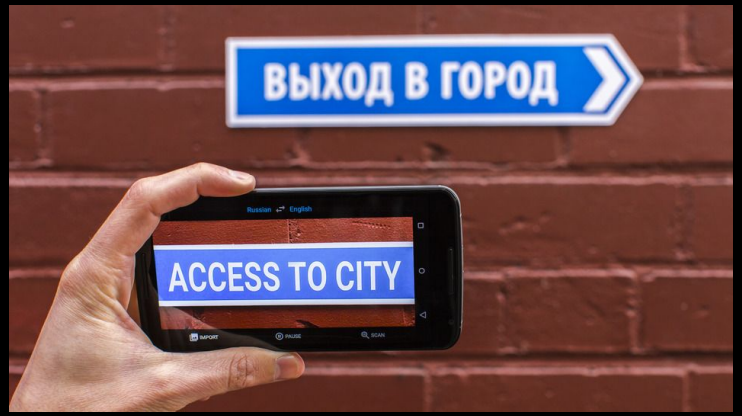
Watson defeats Jeopardy contestants

Stephen Hawking, Elon Musk, and Bill Gates Warn About Artificial Intelligence

SHR- Humanoid Robot

2004

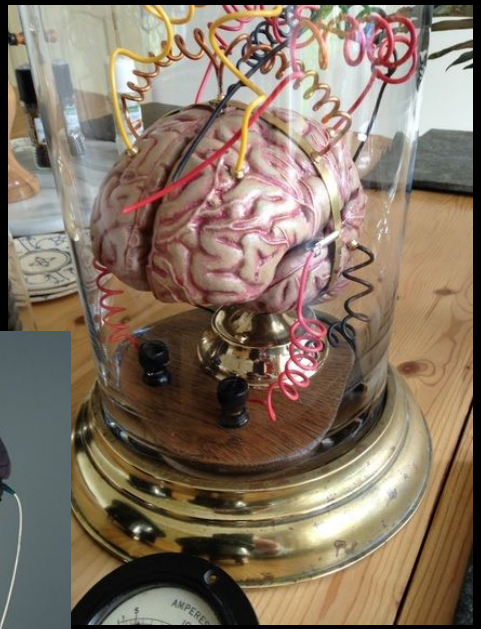
AI: Present


ВЫХОД В ГОРОД
ACCESS TO CITY


Some things you can ask me:
Is my daughter at home?
Find a gas station
Play my party mix
Who leads the NL Central?
What's my ETA?


Microsoft
Tay.ai
TWEETS
96.3K
FOLLOWERS
22.2K
TayTweets
Tweets
Tweets & replies
Photos &

Future of AI




10011110 00100100 10011011 00010011 11100000 01111011 00001101 110001111
00001110 11001100 00000001 10000011 01100111 11111110 00011100 111010010
11111100 00010011 00110001 10110001 00001110 00000011 00011001 000110010
10001110 10110001 11101100 00111011 00011111 01110001 11111010 000011011
00110011 01110011 00000111 10100001 01110111 00000111 11111000 111110111
10000111 01111111 10110100 00010111 11011001 11100110 00111000 111000100
01101111 10000001 00001111 00000010 01110000 11100011 00000110 001000010
01101111 DATA 01100101 01001101 11000111 11011100 100000111
00000110 00001101 11111111 00011001 11110000 011010000
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00000011 11011111 01111010 11100111 11001011 11001100 01111111 111000110
01011111 00000001 11101111 01001011 01100100 10111111 11001000 110111111
10001000 00110110 11000010 11110011 10111110 10000100 00000110 000111110
00011110 11111001 00000100 10011000 11111001 11001011 11011100 111001101
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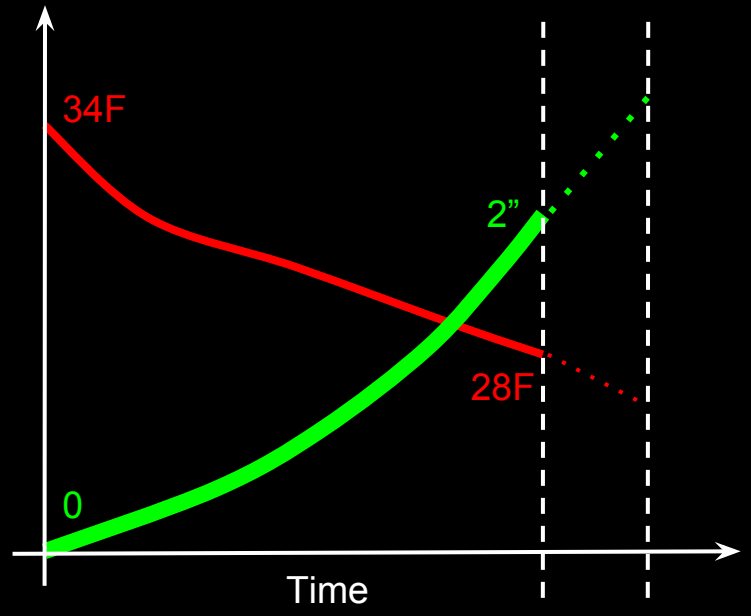
10011110 10111100 11110001 11011000 11101100 01001100 11100111 100101100
01110111 11001111 01000110 00011011 00111100 00111100 11001111 001111001
00110011 10111110 00011110 00000011 11101000 11000111 10110111 101110000
01001001 11000001 01001111 01001111 10000111 10001011 01101001 011000001

Forecast weather for the next hour



What to Measure?

- Temperature
- Snowfall
- Rainfall
- Humidity
- Wind velocity
- Wind Direction

Type of data

Continues

Categorical

Ordered values

Feature Extraction

How do you identify a dog from a cat?

Mental Disorders

Attention Deficit Hyperactivity Disorder (Adults)
Bipolar Disorder.
Borderline Personality Disorder.
Child and Adolescent Disorders.
Chronic or Persistent Pain.
Depression.
Eating Disorders and Obesity.
Generalized Anxiety Disorder.

In 10 years...

https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6347a6.htm

Extroverts vs Introverts

- Body language: how wide your feet are, how straight your spine is
- Where they are sitting: Center vs Corner
- Number of people who talked in an hour
- Speed of conversation: words/min
- How loud they are: db
- If they start the conversation or not
- Eye contact: Yes/no -- what percentage is eye contact

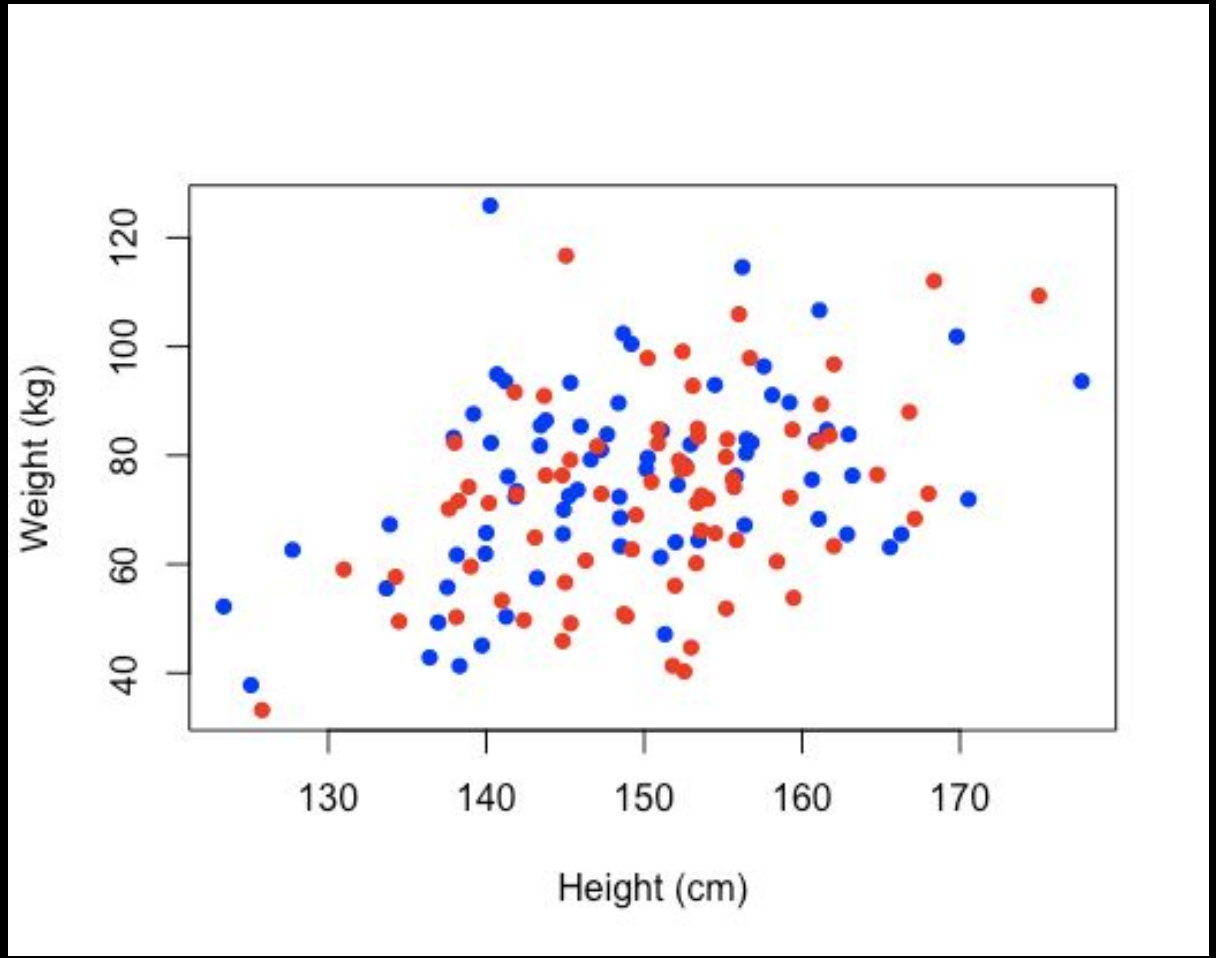
INTROVERTS VS EXTROVERTS

Data

	Drinks	Fav Col	Sleep Quality	Hour of Sleep	F5	F6	F7	Target
Case 1	1	Red	Low	5.3				Introvert
Case 2	5	Blue	Low	5.6				Extrovert
Case 3	4	Red	High	8.3				Extrovert
Case 4	5	Red	Low	6.7				Introvert
Case 6	7	Red	Low	9.6				Extrovert
Case 7	8	Blue	High	7.7				Introvert
Case 8	8	Red	Low	4.4				Introvert
Case 9	0	Red	High	6.8				Introvert

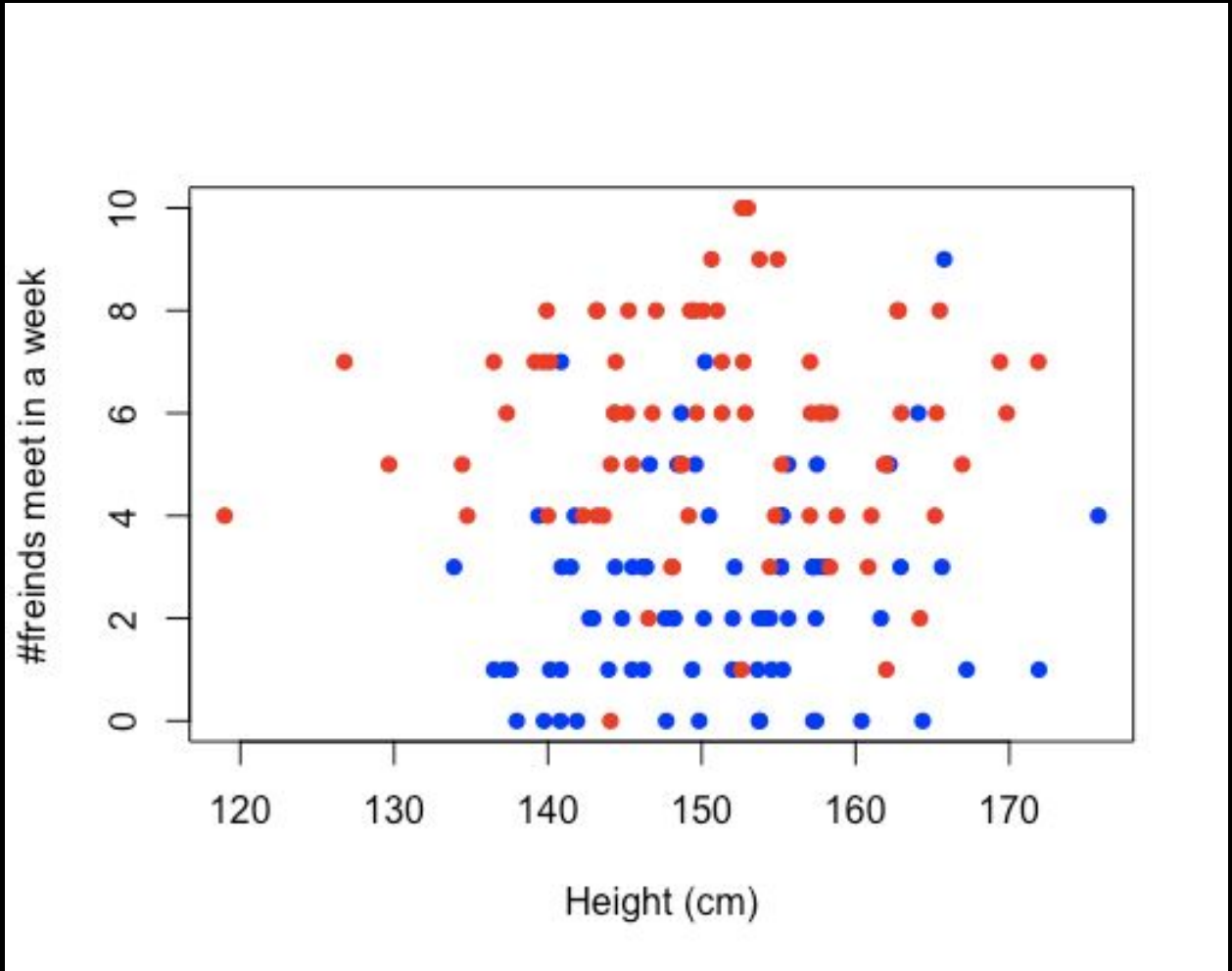
Blue: Introvert

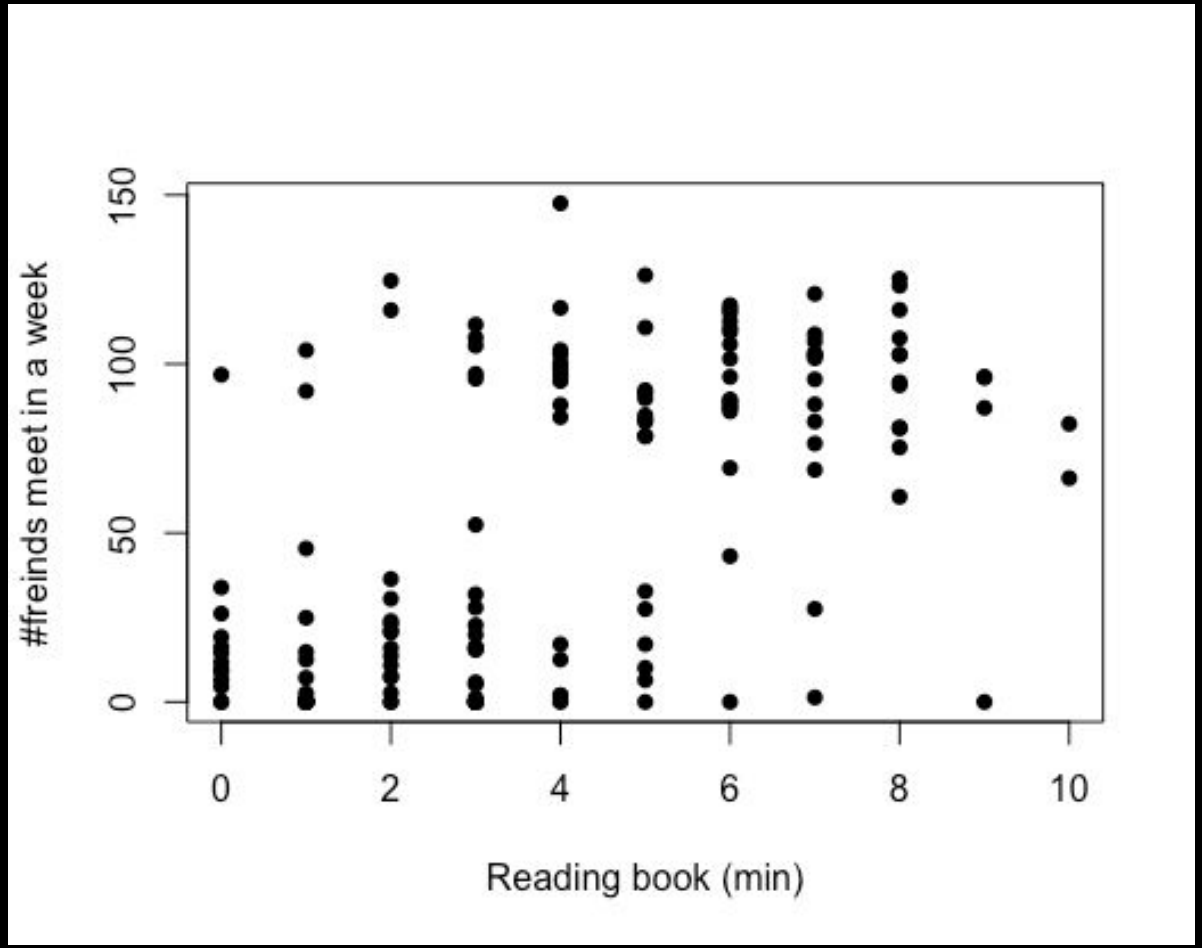
Red: Extrovert



Blue: Introvert

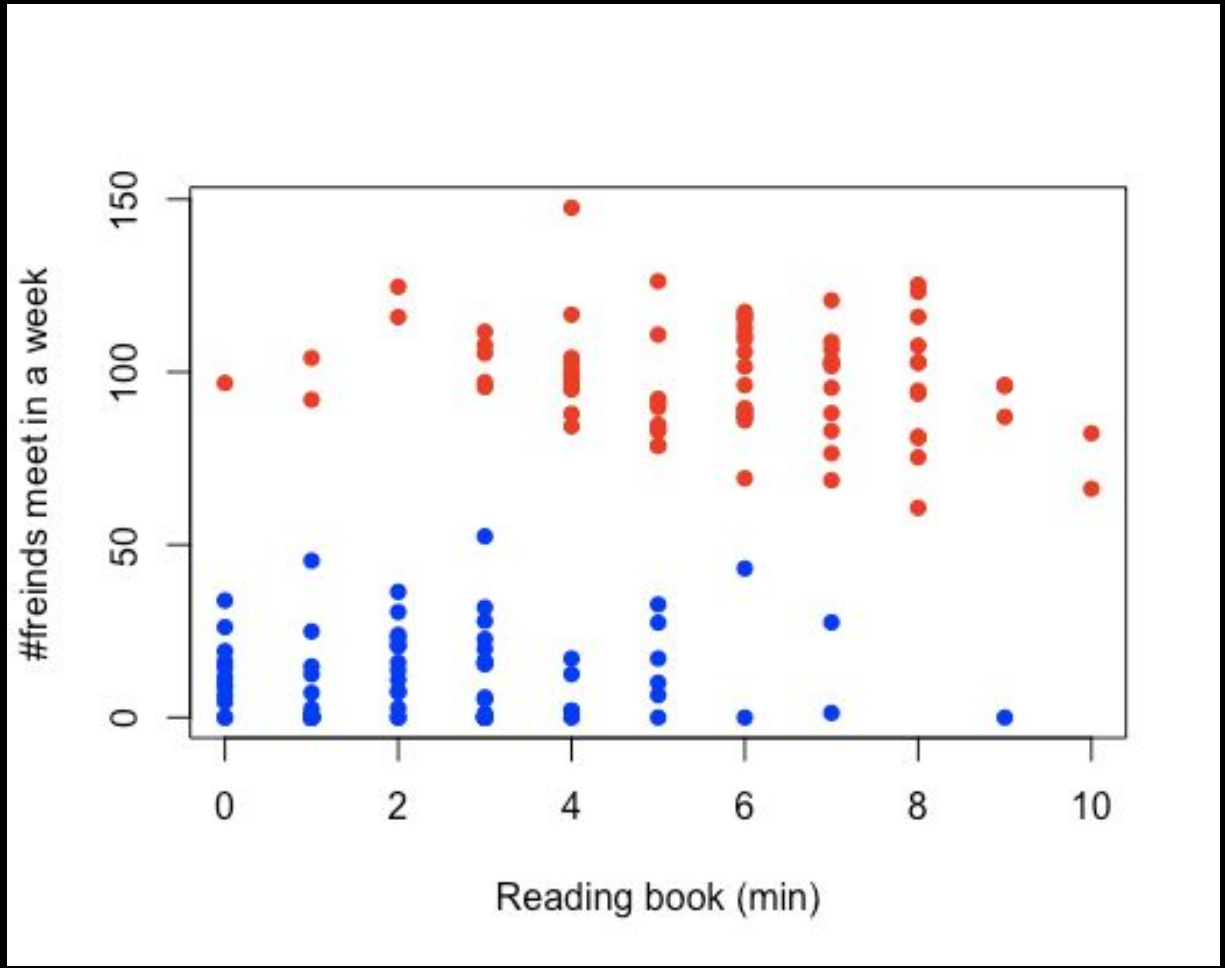
Red: Extrovert




#freinds meet in a week
0
50
100
150
0
2
4
6
8
10
Reading book (min)

Blue: Introvert

Red: Extrovert



Depression and Anxiety

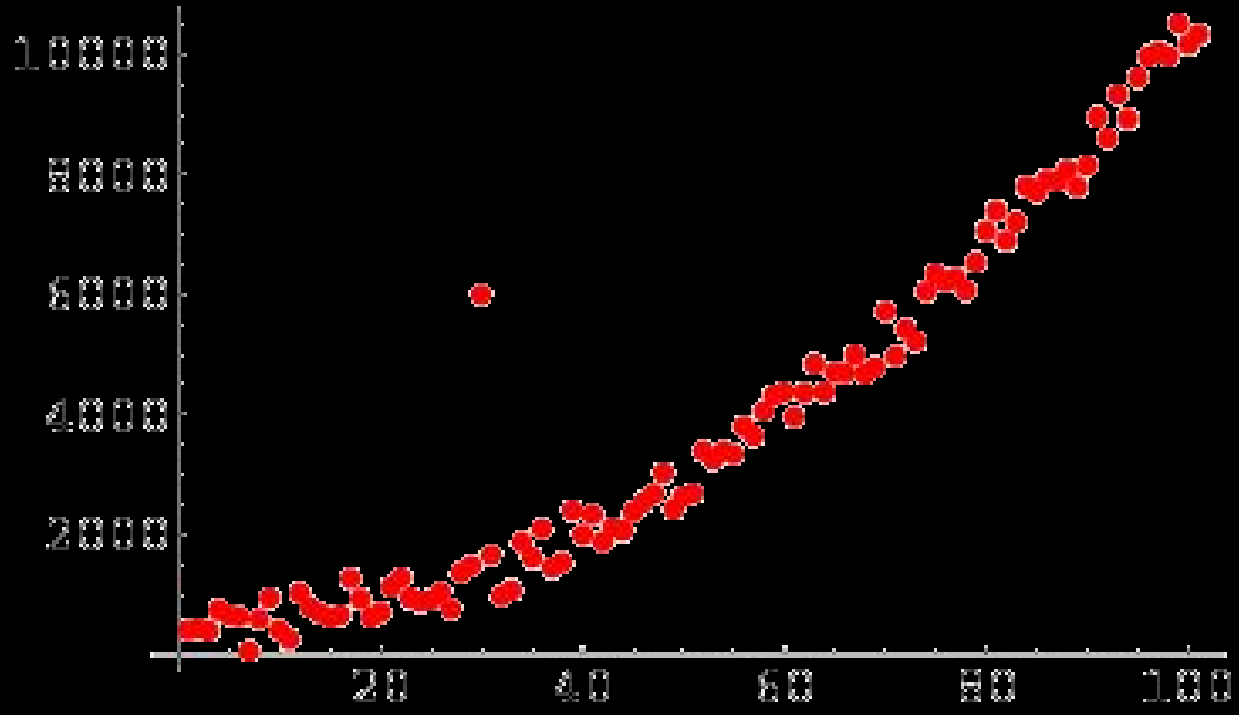
Table II. Frequencies of Adversity Variables within the Sample by Diagnostic Group

Variable	Diagnostic groups			Test statistic
	Depression ($N = 61$)	Anxiety ($N = 61$)	Control ($N = 569$)	
Partner separation	11 (18.0%)	17 (27.9%)	90 (15.8%)	$\chi^2(2, N = 681) = 6.21^{**}$
Change partner	2 (3.2%)	12 (19.7%)	33 (5.8%)	$\chi^2(2, N = 680) = 18.11^{**}$
DAS—prenatal	$M = 41.26$ ($SD = 6.93$)	$M = 38.66$ ($SD = 7.60$)	$M = 41.58$ ($SD = 5.48$)	$F(2, 661) = 6.38^{**}$
DAS—birth	$M = 42.63$ ($SD = 5.09$)	$M = 41.06$ ($SD = 5.98$)	$M = 42.64$ ($SD = 5.05$)	$F(2, 655) = 2.36^{+}$
DAS—6 months	$M = 39.74$ ($SD = 6.29$)	$M = 38.26$ ($SD = 7.63$)	$M = 40.79$ ($SD = 5.72$)	$F(2, 645) = 4.87^{**}$
DAS—5 years	$M = 40.61$ ($SD = 5.36$)	$M = 40.11$ ($SD = 5.92$)	$M = 40.48$ ($SD = 5.74$)	$F(2, 608) = 0.12$
Poverty (low income)	4 (6.6%)	9 (14.8%)	44 (7.7%)	$\chi^2(2, N = 689) = 3.79$
Chronic child illness	6 (9.8%)	3 (4.9%)	55 (9.7%)	$\chi^2(2, N = 691) = 1.50$
Child hospitalizations	4 (6.6%)	9 (14.8%)	64 (11.2%)	$\chi^2(2, N = 691) = 2.11$
Maternal deviance	5 (8.2%)	2 (3.2%)	16 (2.8%)	$\chi^2(2, N = 669) = 4.60^{+}$
Partner deviance	11 (18.0%)	21 (34.4%)	118 (20.7%)	$\chi^2(2, N = 668) = 5.85^{*}$
Maternal prenatal stress	$M = 1.79$ ($SD = 1.42$)	$M = 2.03$ ($SD = 1.57$)	$M = 1.46$ ($SD = 1.56$)	$F(2, 672) = 4.71^{**}$
Maternal postnatal stress	$M = 1.75$ ($SD = 1.64$)	$M = 1.75$ ($SD = 1.64$)	$M = 1.18$ ($SD = 1.37$)	$F(2, 665) = 7.03^{**}$
Number of adversities	$M = 0.51$ ($SD = 0.68$)	$M = 0.93$ ($SD = 1.01$)	$M = 0.56$ ($SD = 0.82$)	$F(2, 643) = 5.67^{**}$
Maternal depressive disorder to age 5	16 (26.2%)	13 (21.3%)	66 (11.6%)	$\chi^2(2, N = 688) = 12.99^{**}$
Maternal anxiety disorder to age 5	3 (4.9%)	4 (6.6%)	18 (3.2%)	$\chi^2(2, N = 690) = 2.13$

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

http://hammenlab.psych.ucla.edu/pubs/05earlyadversity.pdf

Outlier



Outlier

Because thermal expansion, we measures 9.1” instead of 9.5”

Outlier

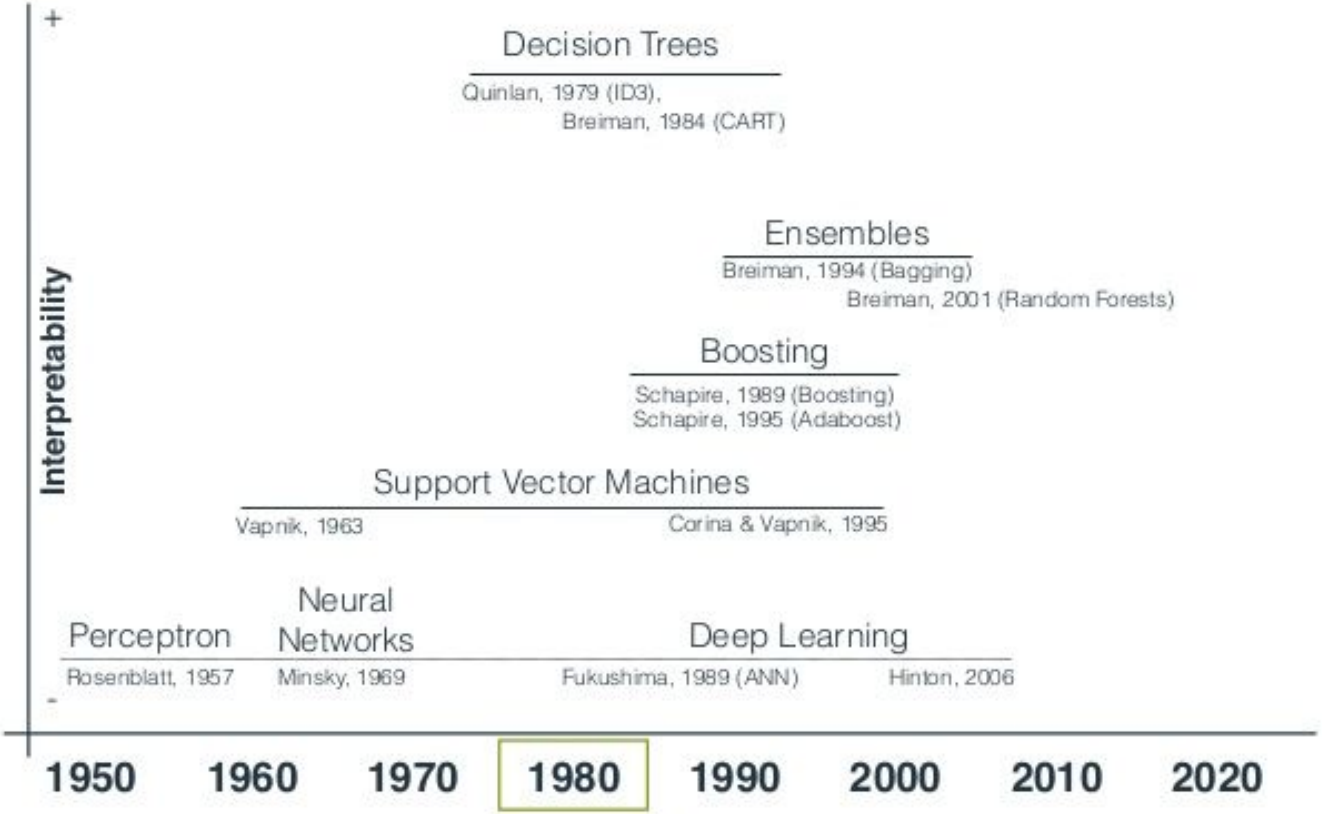
Reading length in cm but reporting in inch

Outlier

Estimating number of subway users: count when the Halloween parade is happening

Summary

Brief History of ML



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