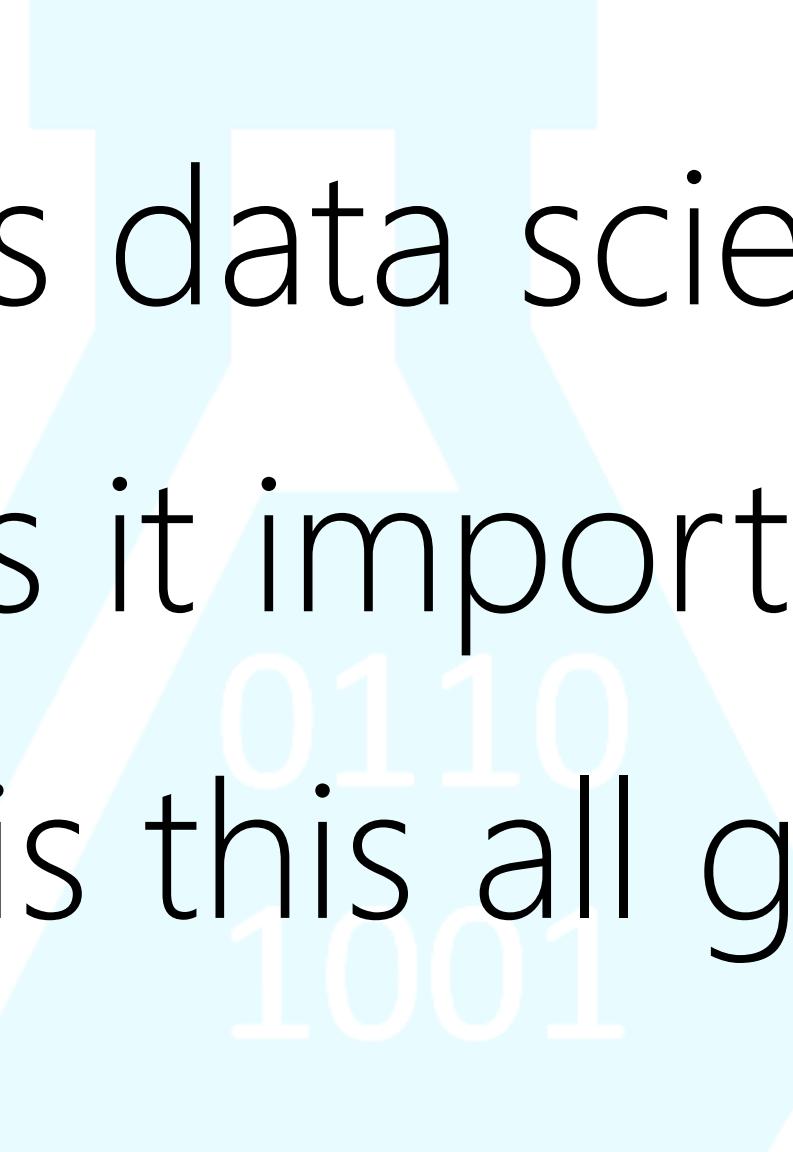


# Data Science for Developers: The Big Picture

@MatthewRenze  
#KCDC



What is data science?

Why is it important?

Where is this all going?







# The New York Times

## For Today's Graduate, Just One Word: Statistics

By STEVE LOMK

Published: August 5, 2009

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\(58\)](#)

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MOUNTAIN VIEW, Calif. — At Harvard, Carrie Grimes majored in anthropology and archaeology and ventured to places like Honduras, where she studied Mayan settlement patterns by mapping where artifacts were found. But she was drawn to what she calls “all the computer and math stuff” that was part of the job.

The Economist

FEBRUARY 27TH-MARCH 5TH 2010

Gordon Brown's pitch  
What went wrong at RBS  
Genetically modified crops blossom  
The EU woos Russia  
The right to eat cats and dogs

The data deluge  
AND HOW TO HANDLE IT: A 14-PAGE SPECIAL REPORT

# Data Scientist: *The Sexiest Job of the 21st Century*

**Meet the people who  
can coax treasure out of  
messy, unstructured data.**

by Thomas H. Davenport  
and D.J. Patil

**W**hen Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives had expected. Something was apparently missing in the social experience. As one LinkedIn manager put it, “It was like arriving at a conference reception and realizing you don't know anyone. So you just stand in the corner sipping your drink—and you probably leave early.”

# Job Postings for Data Scientists

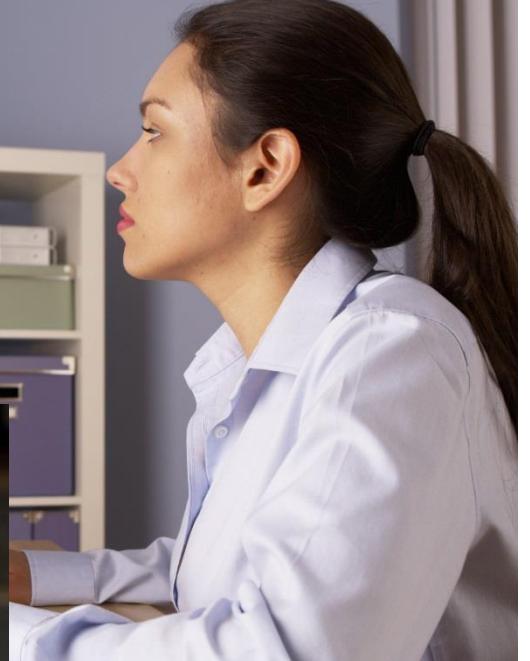
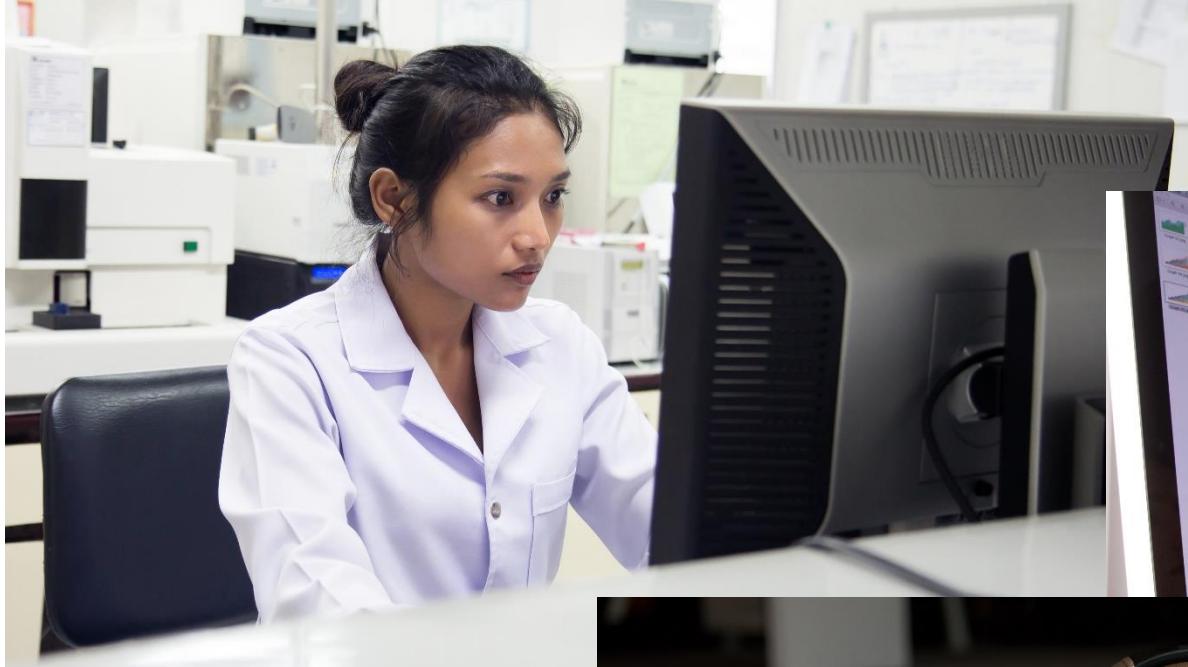


Source: Indeed.com

## TOP-PAYING TECH SKILLS AND EXPERIENCE

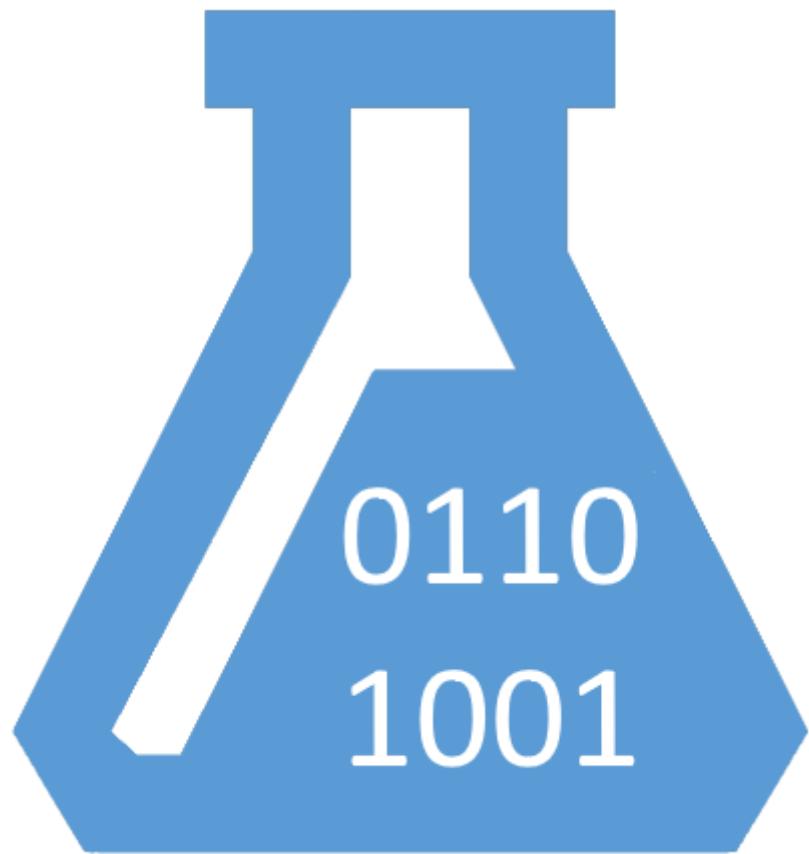
SKILL	2016	YR/YR CHANGE
HANA (High Performance Analytical Application)	\$ 128,958	-3.3%
MapReduce	\$ 125,009	-0.3%
Cloud Foundry	\$ 124,038	n/a
Hbase	\$ 123,934	5.7%
Omnigraffle	\$ 123,782	-1.9%
Cassandra	\$ 123,459	2.2%
Apache Kafka	\$ 122,728	n/a
SOA (Service Oriented Architecture)	\$ 122,094	-1.9%
Ansible	\$ 121,382	n/a
Jetty	\$ 120,978	1.3%
PaaS (Platform as a Service)	\$ 120,403	-4.4%
Elasticsearch	\$ 120,002	n/a
ABAP (Advanced Business Application Programming)	\$ 119,961	0.5%
NoSQL	\$ 119,498	1.3%
CMMI (Capability Maturity Model Integration)	\$ 119,466	-0.6%
Amazon Redshift	\$ 119,197	n/a
Pig	\$ 119,118	-4.2%
Solr	\$ 119,032	0.1%
Cloudera	\$ 118,896	-9.0%
Docker	\$ 118,873	0.2%

SKILL	2016	YR/YR CHANGE
Amazon Route 53	\$ 118,828	n/a
Hadoop	\$ 118,625	-2.5%
Hive	\$ 118,589	-1.3%
Korn Shell	\$ 118,273	1.4%
PMBok (Project Management Body of Knowledge)	\$ 118,233	0.7%
Dynamo DB	\$ 118,119	n/a
Groovy	\$ 117,897	-0.1%
IaaS (Infrastructure as a Service)	\$ 117,422	n/a
JAX-RS (Java API RestFUL Services)	\$ 116,997	n/a
RabbitMQ	\$ 116,909	n/a
JDBC (Java Database Connectivity)	\$ 116,833	2.0%
SOX (Sarbanes Oxley)	\$ 116,743	0.6%
Objective C	\$ 116,667	2.5%
FCoE (Fibre Channel over Ethernet)	\$ 116,145	7.2%
UML (Unified Modeling Language)	\$ 115,285	-3.6%
XSLT (Extensible Stylesheet Language Transformations)	\$ 115,089	3.5%
Redis	\$ 114,922	2.8%
ETL (Extract Transform and Load)	\$ 114,892	2.6%
SDN (Software Defined Network)	\$ 114,739	-2.3%
Informatica	\$ 114,143	1.1%

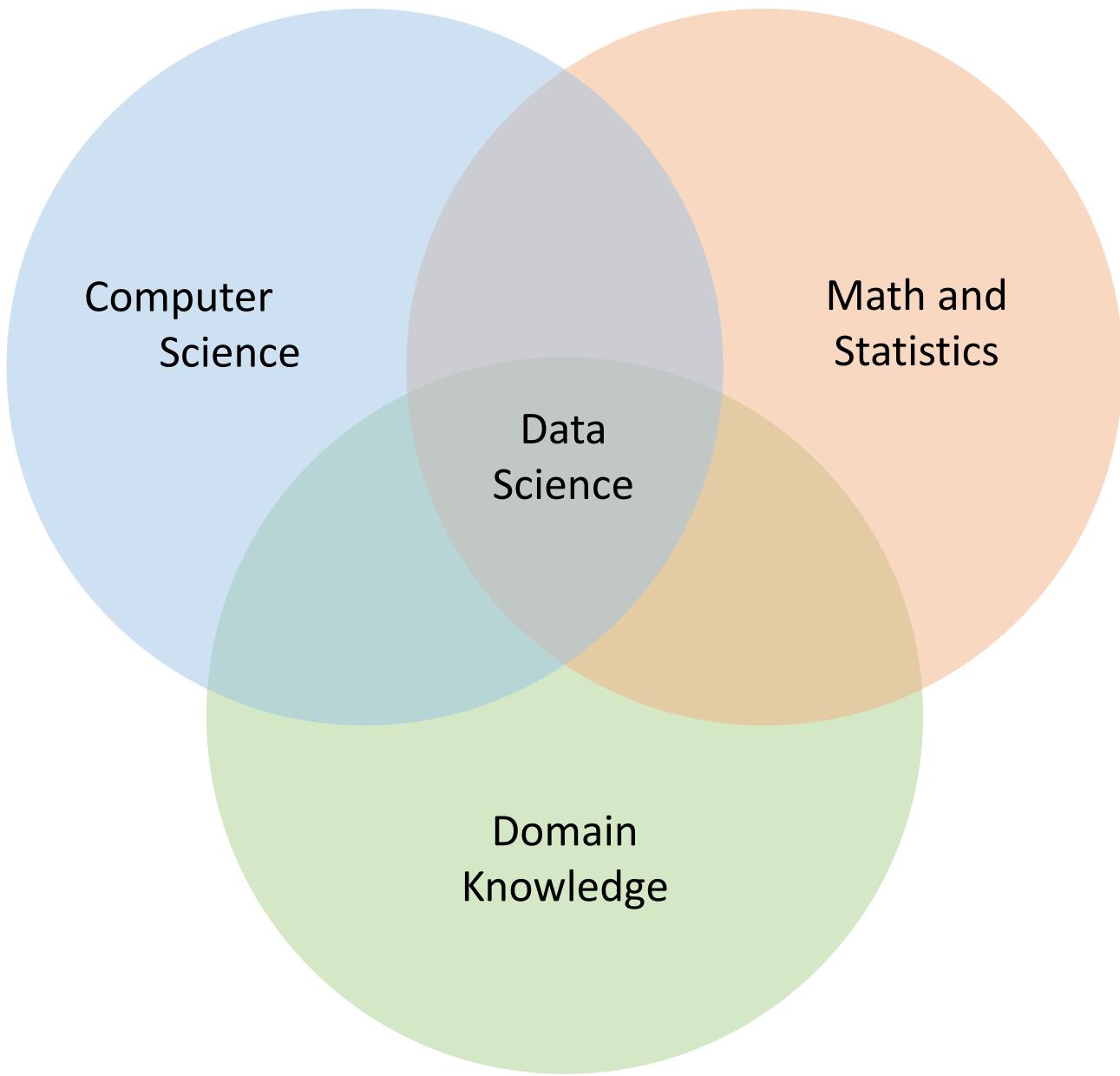






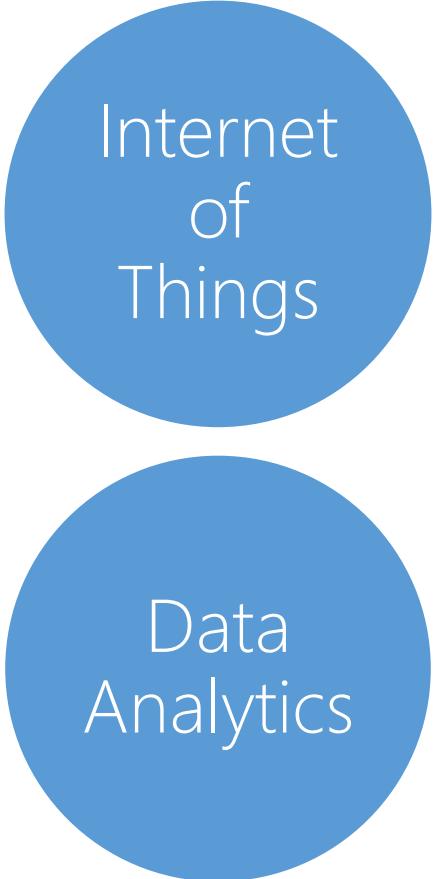


# What is Data Science?



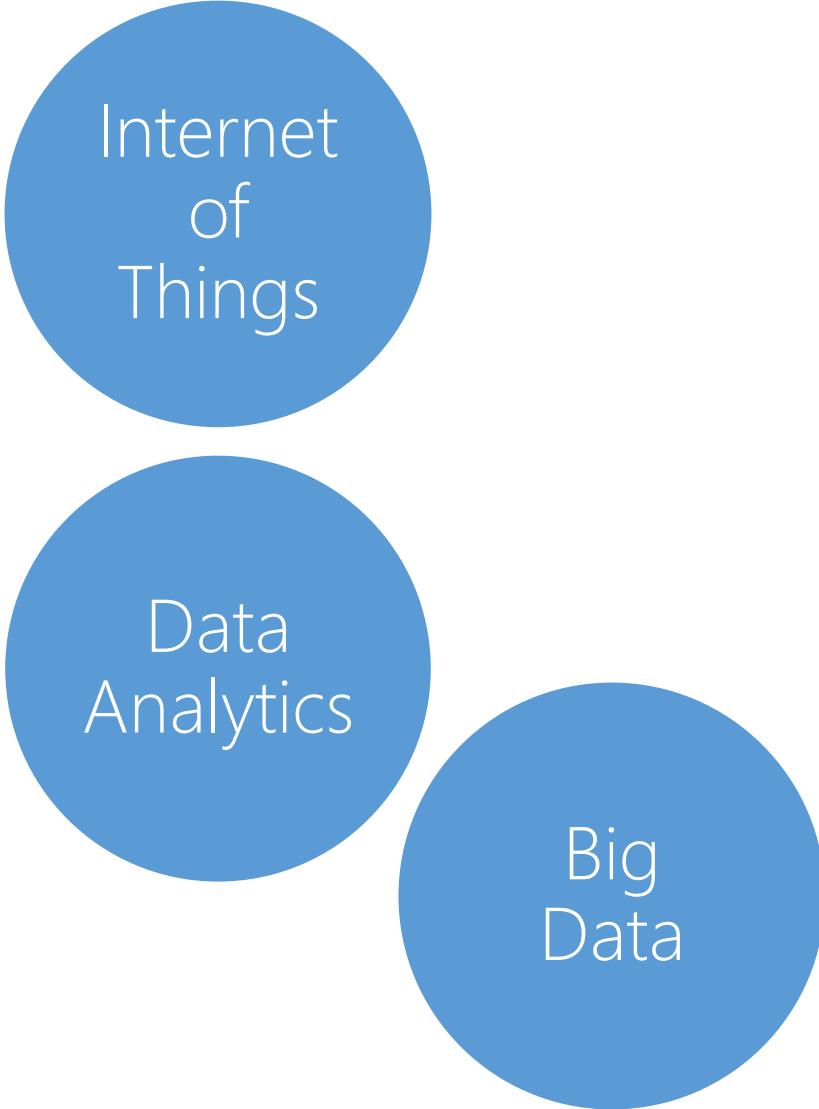
# Why is Data Science Important?

Data  
Analytics



Internet  
of  
Things

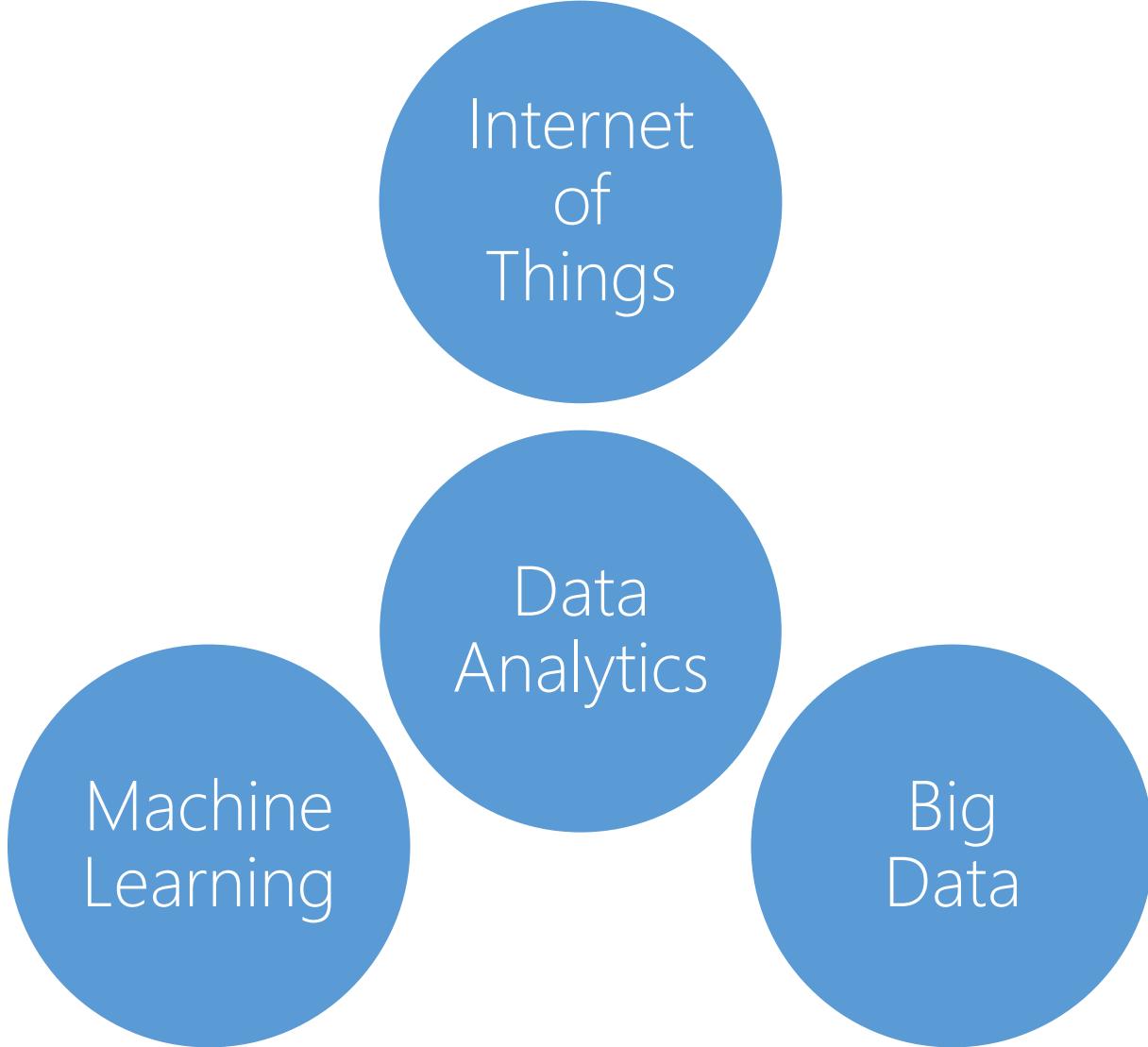
Data  
Analytics



Internet  
of  
Things

Data  
Analytics

Big  
Data

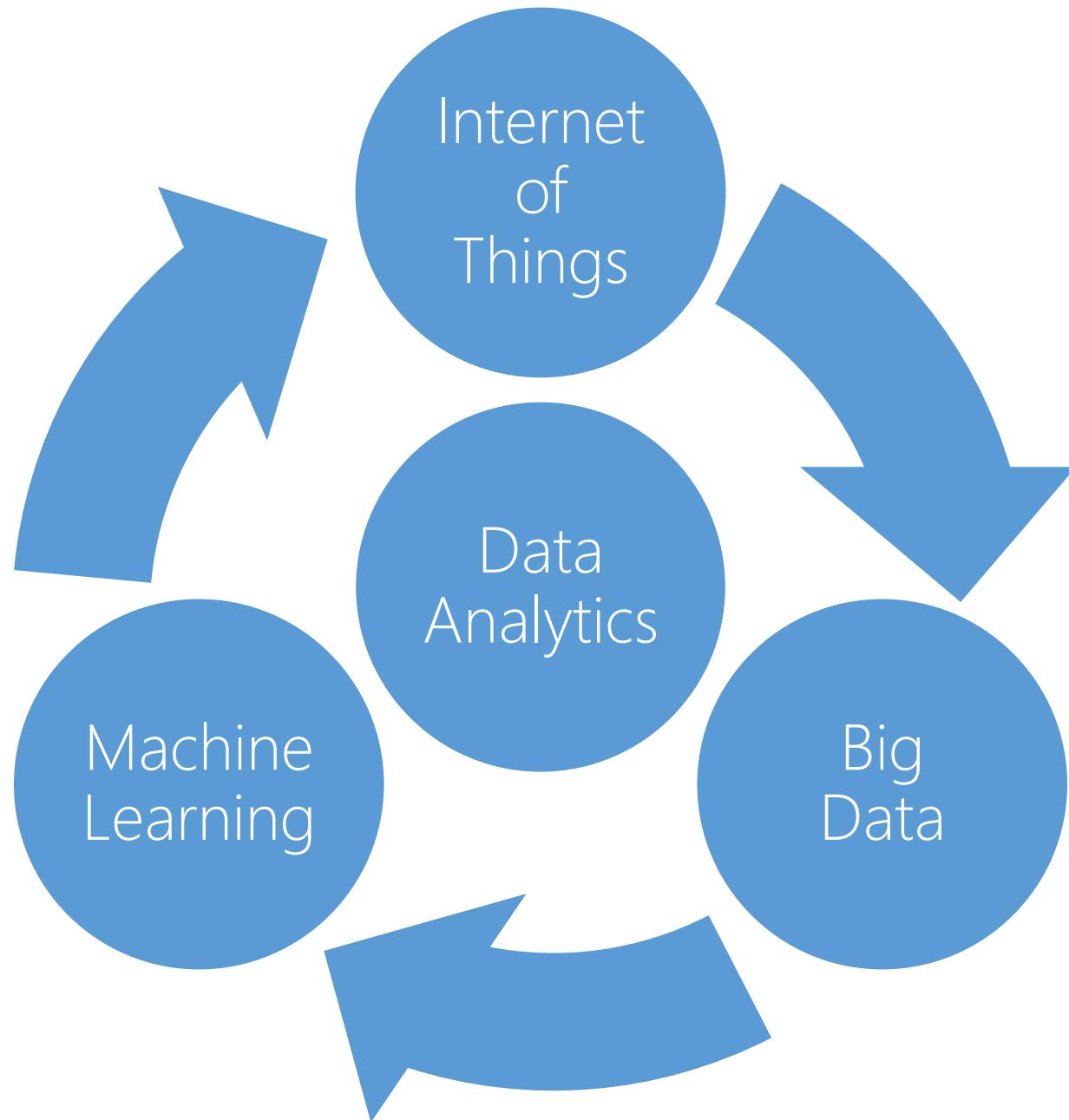


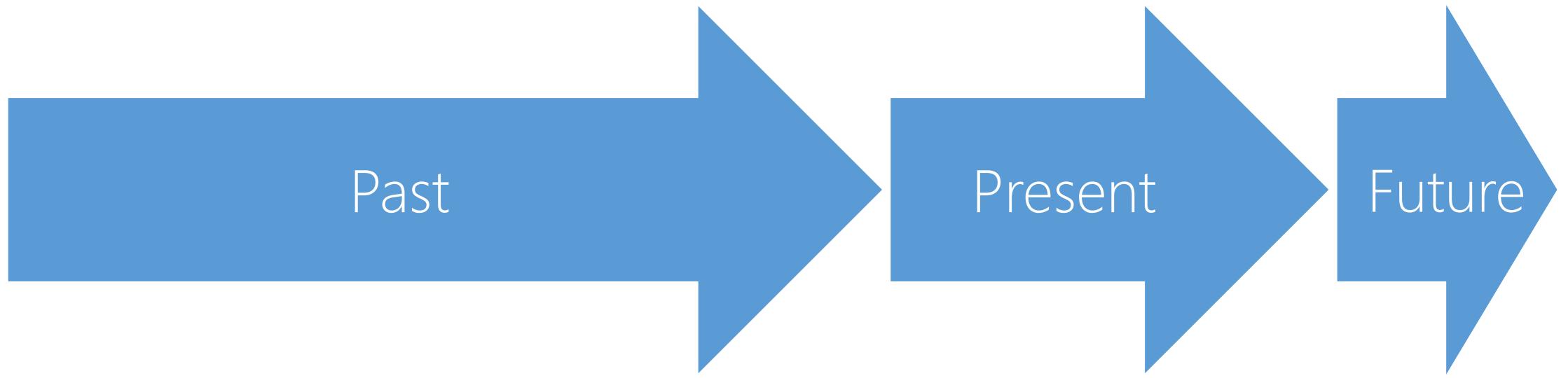
Internet  
of  
Things

Data  
Analytics

Machine  
Learning

Big  
Data

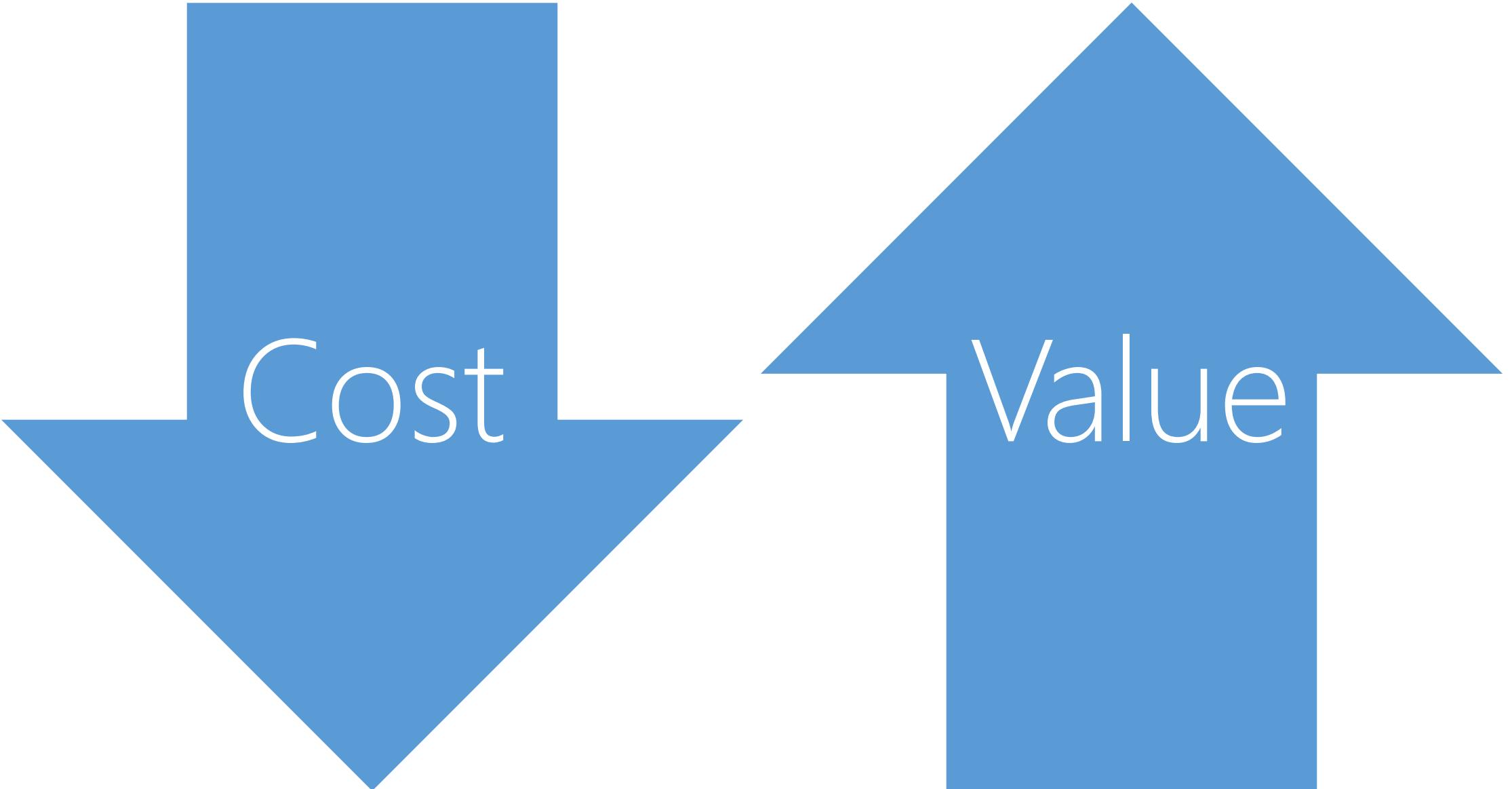


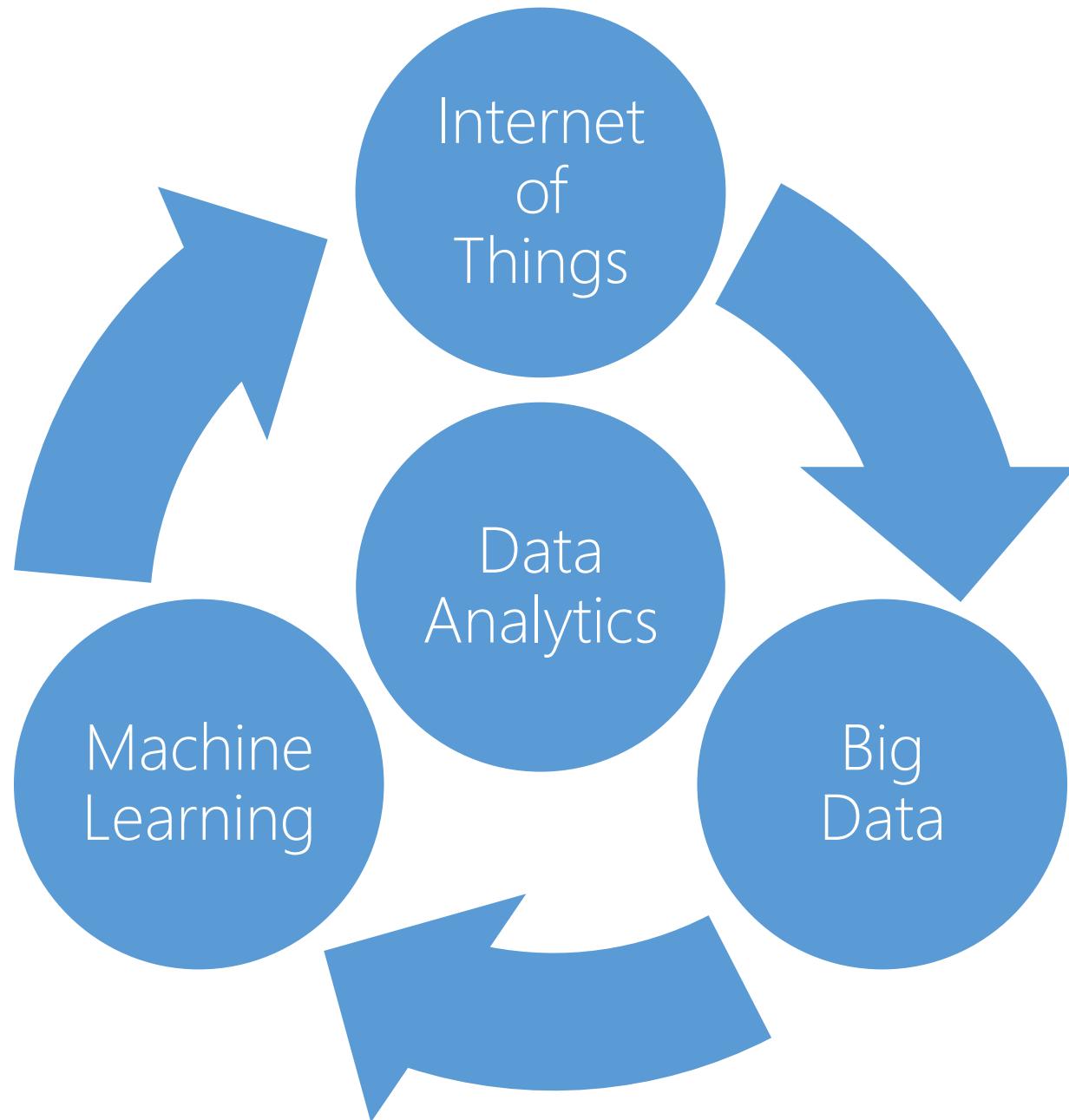


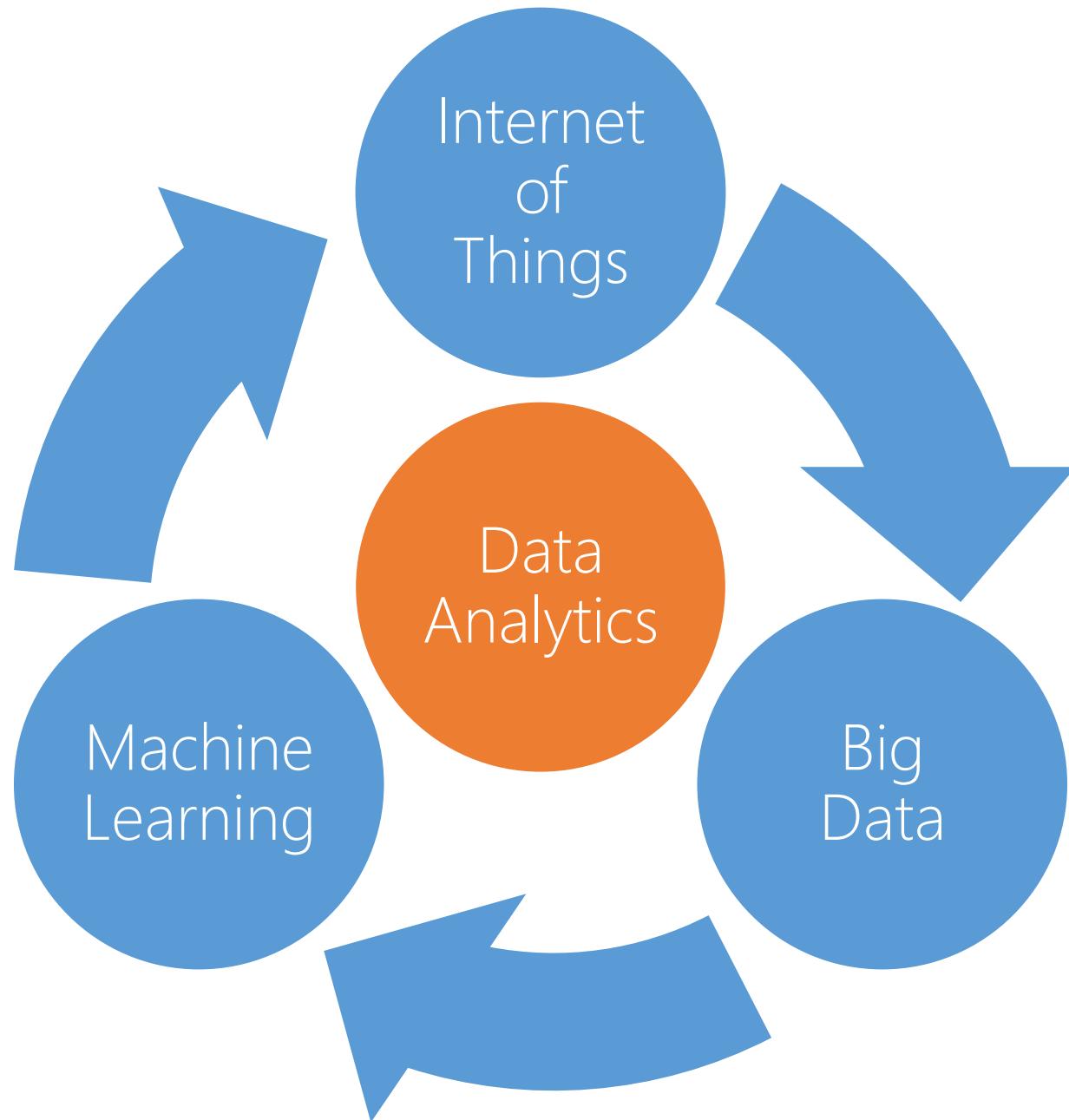


Driven by economics

Possible by technology



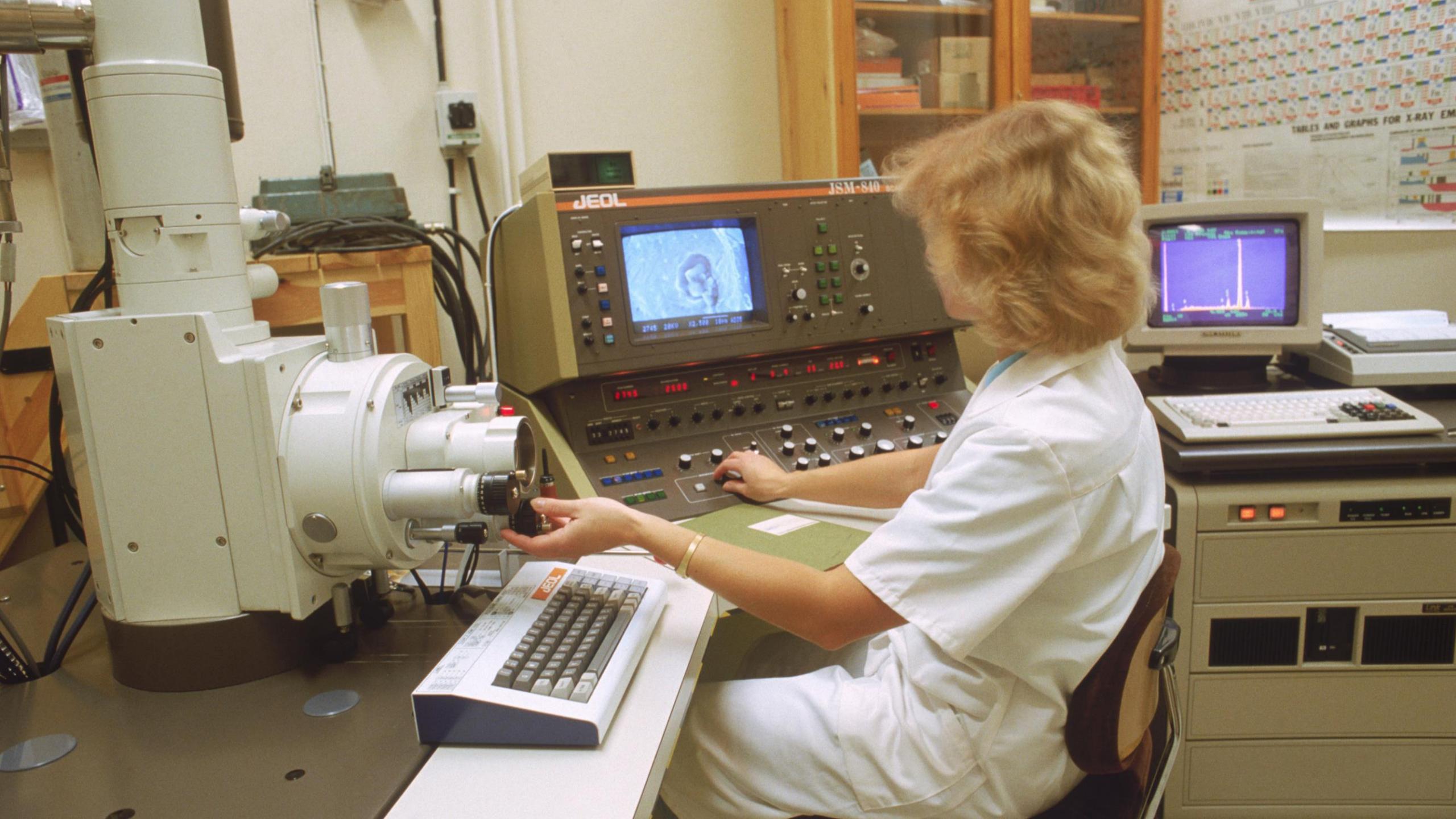






# Data Analysis (The Past)





JEOL

JSM-840



2745 2849 32 322 189 422



SUMITOMO

JEOL

SAS

File Edit View Tools Solutions Window Help

Using This Window  
SAS Help and Documentation  
Getting Started with SAS Software  
Learning SAS Programming  
SAS on the Web

SAS Environment  
SAS Libraries  
SAS Help  
Profile  
Work  
File Shortcuts  
Favorites Folders  
My Documents  
My Desktop  
SAS Repository View  
3½ Floppy (A)  
System (C)  
Compact Disc (D)

Results Viewer - C:\WINNT\system32\pretty005.pdf

About SAS System

Total Product Sales by Country for 1997 & 1998  
Country = Canada

Country	Product Type	1997		1998		Combined	
		Actual Sales	Predicted Sales	Actual Sales	Predicted Sales	Actual Sales	Predicted Sales
Canada	FURNITURE BED	\$224,162	\$225,449	\$226,509	\$226,818	\$448,671	\$452,207
	SOFA	\$273,456	\$242,847	\$243,794	\$273,047	\$477,230	\$518,480
OFFICE	AP	\$177,588	\$278,296	\$280,303	\$177,588	\$455,176	\$455,176
	Chair	\$202,383	\$220,991	\$220,458	\$220,458	\$423,833	\$441,458
	DASH	\$230,870	\$225,445	\$226,866	\$226,866	\$457,730	\$457,730
	AK	\$112,353	\$266,436	\$264,572	\$264,572	\$398,551	\$394,672
All Products							\$741,659.70

h105\_example.log - Epsilon

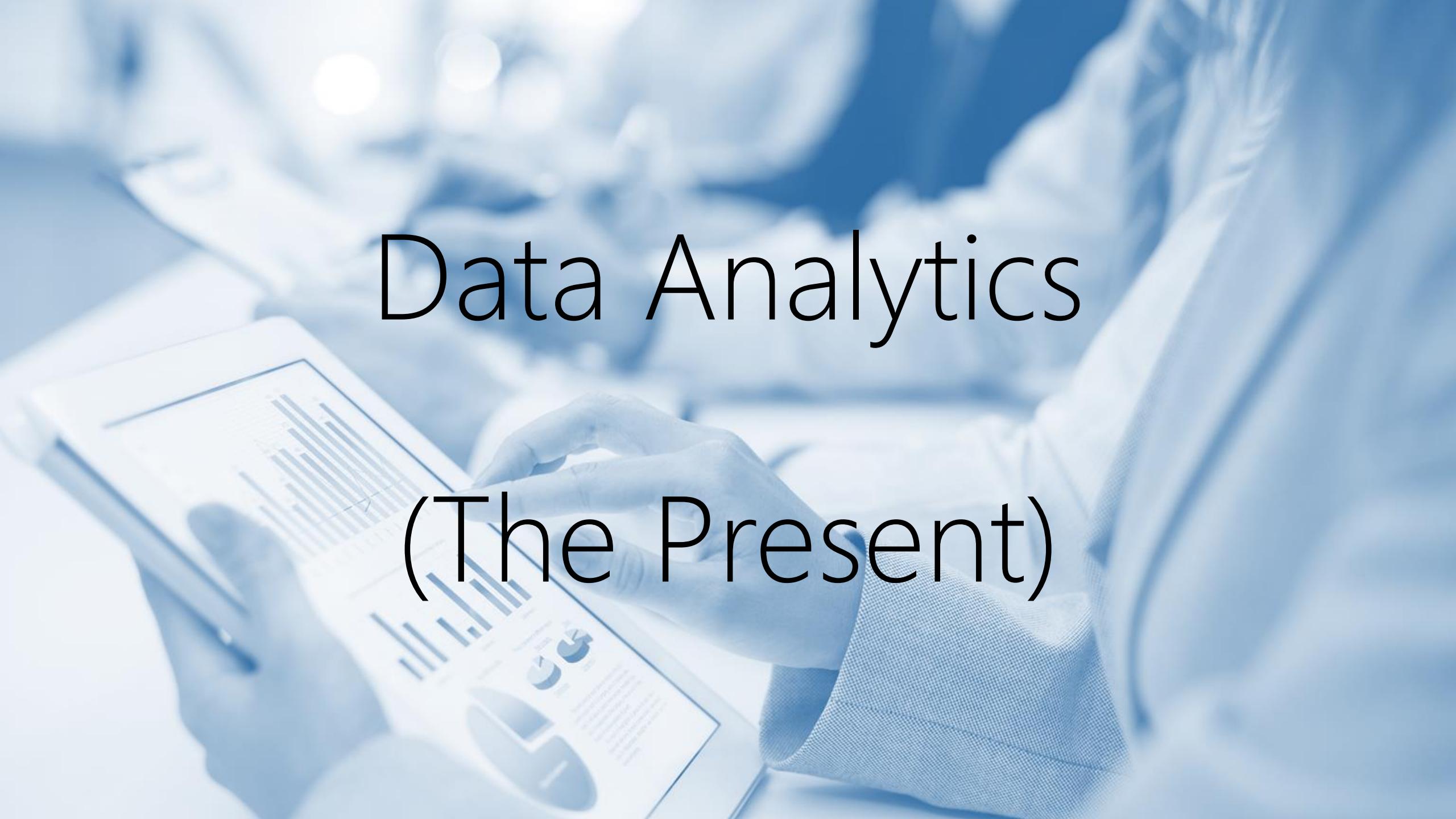
File Edit Search Process Utility Window Help

-----  
log: C:\docs\_Bayesian\_Statistics\h105\_example.log  
log type: text  
opened on: 13 Oct 2009, 16:31:04  
.d  
Contains data from C:\docs\_Bayesian\_Statistics\h105.dta  
obs: 443  
vars: 9 13 Oct 2009 16:28  
size: 16,834 (99.9% of memory free)  
-----  
variable name storage display value  
variable type format label variable label  
-----  
congress int %8.0g Congress  
id long %12.0g icpsr id number  
state byte %8.0g icpsr state code  
district byte %8.0g cong. district number  
statenm str7 %9s name of state  
party int %8.0g 100=Demo, 200=Repub  
member str9 %9s name of member  
x1 float %9.0g dwnom 1st dim.  
x2 float %9.0g dwnom 2nd dim  
-----  
Sorted by:  
-----  
h105\_example.log [Fundamental] 19,0 Top  
Epsilon Programmer's Editor 13.08, EEL version 13.08

CHODE

PAGE 174

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT	
003492	0110 2248	00260	0101	05	DR	
003492	0110 2248	00260	0102	SVC	99	ADDRESS OF ADDRESS OF RB
003492	0110 2248	00260	0103	LTR	CORPCODE,CORPCODE	CALL DYNAMIC ALLOCATION
003492	0110 2248	00260	0104	BINZ	AERR3	SEE IF FAILED
003492	0110 2248	00260	0105	MVC	JESACB+ACBDRN-SPACB(16),DRNHE ROVE CONNAME	YES ISSUE MESSAGE
003492	0110 2248	00260	0106	OPEN	(JESACB)	OPEN INTERNAL CONSOLE
003492	0110 2248	00260	0107	CNDP	8,4	ALGN LIST TO FULLWORD
003492	0110 2248	00260	0108	BAL	3,X,W	LOAD REG1 W/ LIST ADDR.
003492	0110 2248	00260	0109	DC	AL111201	OPTION BYTE
003492	0110 2248	00260	0110	DC	AL3,JESACB	DCR ADDRESS
003492	0110 2248	00260	0111	SVC	1V	ISSUE OPEN SVC
003492	0110 2248	00260	0112	LTR	CORPCODE,CORPCODE	
003492	0110 2248	00260	0113	BINZ	AERR2	ISSUE RPL MSG
003492	0110 2248	00260	0114	LA	R3,JESACB	ADDRESS OF ACB
003492	0110 2248	00260	0115	ST	R3,JESPLH+RPLD+ACB+IFERPL1	STORE IN RPL
003492	0110 2248	00260	0116	LA	R3,CPO	ADDRESS OF CPO BUFFER
003492	0110 2248	00260	0117	ST	R3,JESPLH+RPLAHE+2PDRPL1	STORE IN RPL
003492	0110 2248	00260	0118	L	R3,CHLEN	LENGTH OF COMMAND BUFFER
003492	0110 2248	00260	0119	ST	R3,JESPLH+RPLAHE+2PDRPL1	STORE IN RPL
003492	0110 2248	00260	0120	S	CIR	
003492	0110 2248	01000	0181	SYS	05	SYNSTAT2,BTS
003492	0110 2248	01000	0182	S	ARMK	
003492	0110 2248	01000	0183	CIR	P0CPT,,PUT	
003492	0110 2248	01000	0184	CIR	LA	R3,PROMPT
003492	0110 2248	01000	0185	LD	LA	R3,PROMPT
003492	0110 2248	01000	0186	LD	LDH2,PUT	SET LENGTH
003492	0110 2248	01000	0187	PUT	SD,TO,SET	SD TO PUT
003492	0110 2248	01000	0188	ARMK	P0CPT,,SET	
003492	0110 2248	01000	0189	ARMK	LA	R3,CPO
003492	0110 2248	01000	0190	RD	RD,78	SET ADDRESS
003492	0110 2248	01000	0191	RD	RD,78	SET LENGTH
003492	0110 2248	01000	0192	BAL	LDH2,GET	SD TO SET
003492	0110 2248	01000	0193	TH	\$19STAT2,BTS	IS 'SYS' IN EFFECT?
003492	0110 2248	01000	0194	RD	RD,78	YES, PROCESS
003492	0110 2248	01000	0195	CLC	CHD131,H2,E01	
003492	0110 2248	01000	0196	RD	RD,78	
003492	0110 2248	01000	0197	RD	RD,78	
003492	0110 2248	01000	0198	RD	RD,78	
003492	0110 2248	01000	0199	RD	RD,78	
003492	0110 2248	01000	0200	RD	RD,78	
003492	0110 2248	01000	0201	RD	RD,78	
003492	0110 2248	01000	0202	RD	RD,78	
003492	0110 2248	01000	0203	RD	RD,78	
003492	0110 2248	01000	0204	RD	RD,78	
003492	0110 2248	01000	0205	RD	RD,78	
003492	0110 2248	01000	0206	RD	RD,78	
003492	0110 2248	01000	0207	RD	RD,78	
003492	0110 2248	01000	0208	RD	RD,78	
003492	0110 2248	01000	0209	RD	RD,78	
003492	0110 2248	01000	0210	RD	RD,78	
003492	0110 2248	01000	0211	RD	RD,78	
003492	0110 2248	01000	0212	RD	RD,78	
003492	0110 2248	01000	0213	RD	RD,78	
003492	0110 2248	01000	0214	RD	RD,78	
003492	0110 2248	01000	0215	RD	RD,78	
003492	0110 2248	01000	0216	RD	RD,78	
003492	0110 2248	01000	0217	RD	RD,78	
003492	0110 2248	01000	0218	RD	RD,78	
003492	0110 2248	01000	0219	RD	RD,78	
003492	0110 2248	01000	0220	RD	RD,78	
003492	0110 2248	01000	0221	RD	RD,78	
003492	0110 2248	01000	0222	RD	RD,78	
003492	0110 2248	01000	0223	RD	RD,78	
003492	0110 2248	01000	0224	RD	RD,78	
003492	0110 2248	01000	0225	RD	RD,78	
003492	0110 2248	01000	0226	RD	RD,78	
003492	0110 2248	01000	0227	RD	RD,78	
003492	0110 2248	01000	0228	RD	RD,78	
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003492	0110 2248	01000	0232	RD	RD,78	
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003492	0110 2248	01000	0236	RD	RD,78	
003492	0110 2248	01000	0237	RD	RD,78	
003492	0110 2248	01000	0238	RD	RD,78	
003492	0110 2248	01000	0239	RD	RD,78	
003492	0110 2248	01000	0240	RD	RD,78	
003492	0110 2248	01000	0241	RD	RD,78	
003492	0110 2248	01000	0242	RD	RD,78	
003492	0110 2248	01000	0243	RD	RD,78	
003492	0110 2248	01000	0244	RD	RD,78	
003492	0110 2248	01000	0245	RD	RD,78	
003492	0110 2248	01000	0246	RD	RD,78	
003492	0110 2248	01000	0247	RD	RD,78	
003492	0110 2248	01000	0248	RD	RD,78	
003492	0110 2248	01000	0249	RD	RD,78	
003492	0110 2248	01000	0250	RD	RD,78	
003492	0110 2248	01000	0251	RD	RD,78	
003492	0110 2248	01000	0252	RD	RD,78	
003492	0110 2248	01000	0253	RD	RD,78	
003492	0110 2248	01000	0254	RD	RD,78	
003492	0110 2248	01000	0255	RD	RD,78	
003492	0110 2248	01000	0256	RD	RD,78	
003492	0110 2248	01000	0257	RD	RD,78	
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003492	0110 2248	01000	0259	RD	RD,78	
003492	0110 2248	01000	0260	RD	RD,78	
003492	0110 2248	01000	0261	RD	RD,78	
003492	0110 2248	01000	0262	RD	RD,78	
003492	0110 2248	01000	0263	RD	RD,78	
003492	0110 2248	01000	0264	RD	RD,78	
003492	0110 2248	01000	0265	RD	RD,78	
003492	0110 2248	01000	0266	RD	RD,78	
003492	0110 2248	01000	0267	RD	RD,78	
003492	0110 2248	01000	0268	RD	RD,78	
003492	0110 2248	01000	0269	RD	RD,78	
003492	0110 2248	01000	0270	RD	RD,78	
003492	0110 2248	01000	0271	RD	RD,78	
003492	0110 2248	01000	0272	RD	RD,78	
003492	0110 2248	01000	0273	RD	RD,78	
003492	0110 2248	01000	0274	RD	RD,78	
003492	0110 2248	01000	0275	RD	RD,78	
003492	0110 2248	01000	0276	RD	RD,78	
003492	0110 2248	01000	0277	RD	RD,78	
003492	0110 2248	01000	0278	RD	RD,78	
003492	0110 2248	01000	0279	RD	RD,78	
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003492	0110 2248	01000	0281	RD	RD,78	
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003492	0110 2248	01000	0283	RD	RD,78	
003492	0110 2248	01000	0284	RD	RD,78	
003492	0110 2248	01000	0285	RD	RD,78	
003492	0110 2248	01000	0286	RD	RD,78	
003492	0110 2248	01000	0287	RD	RD,78	
003492	0110 2248	01000	0288	RD	RD,78	
003492	0110 2248	01000	0289	RD	RD,78	
003492	0110 2248	01000	0290	RD	RD,78	
003492	0110 2248	01000	0291	RD	RD,78	
003492	0110 2248	01000	0292	RD	RD,78	
003492	0110 2248	01000	0293	RD	RD,78	
003492	0110 2248	01000	0294	RD	RD,78	
003492	0110 2248	01000	0295	RD	RD,78	
003492	0110 2248	01000	0296	RD	RD,78	
003492	0110 2248	01000	0297	RD	RD,78	
003492	0110 2248	01000	0298	RD	RD,78	
003492	0110 2248	01000	0299	RD	RD,78	
003492	0110 2248	01000	0300	RD	RD,78	
003492	0110 2248	01000	0301	RD	RD,78	
003492	0110 2248	01000	0302	RD	RD,78	
003492	0110 2248	01000	0303	RD	RD,78	
003492	0110 2248	01000	0304	RD	RD,78	
003492	0110 2248	01000	0305	RD	RD,78	
003492	0110 2248	01000	0306	RD	RD,78	
003492	0110 2248	01000	0307	RD	RD,78	
003492	0110 2248	01000	0308	RD	RD,78	
003492	0110 2248	01000	0309	RD	RD,78	
003492	0110 2248	01000	0310	RD	RD,78	
003492	0110 2248	01000	0311	RD	RD,78	
003492	0110 2248	01000	0312	RD	RD,78	
003492	0110 2248	01000	0313	RD	RD,78	
003492	0110 2248	01000	0314	RD	RD,78	
003492	0110 2248	01000	0315	RD	RD,78	
003492	0110 2248	01000	0316	RD	RD,78	
003492	0110 2248	01000	0317	RD	RD,78	
003492	0110 2248	01000	0318	RD	RD,78	
003492	0110 2248	01000	0319	RD	RD,78	
003492	0110 2248	01000	0320	RD	RD,78	
003492	0110 2248	01000	0321	RD	RD,78	
00349						

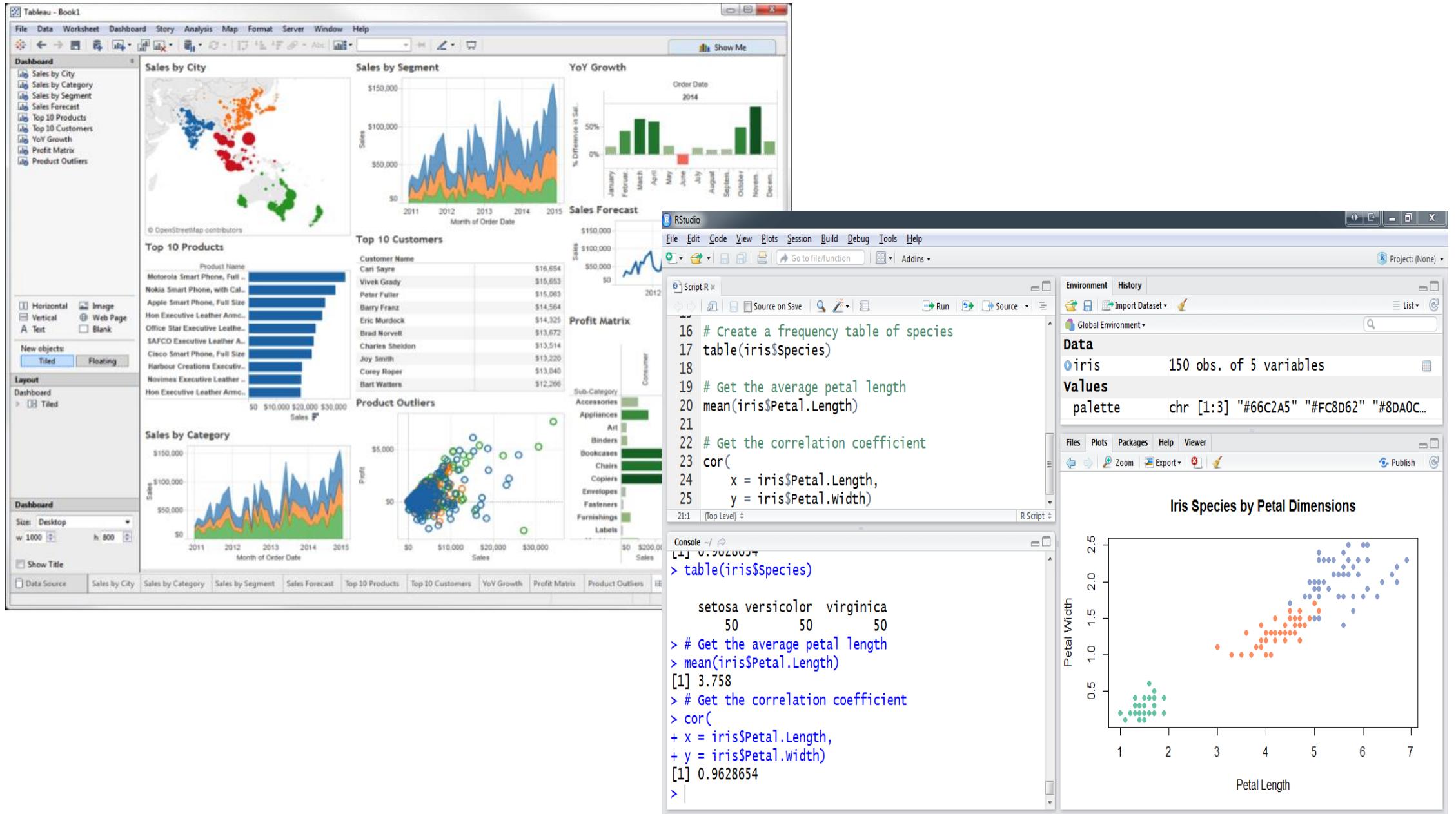
A close-up photograph of a person's hands and face. The person is wearing a light blue surgical mask and a pair of blue nitrile gloves. They are holding a white sheet of paper with several blue bar charts and a small pie chart printed on it. The background is blurred, showing more of the same blue medical supplies.

# Data Analytics

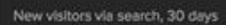
## (The Present)







Marketing



20,340

3,634

18

5,700

Facebook Ads spend, Campaign Y

\$47.57  
spent all time

Mailchimp weekly list growth

137  
▲ 15.13%

Current website

13

95%

\$50

377

Average CPC,  
£0.8  
▼ 36

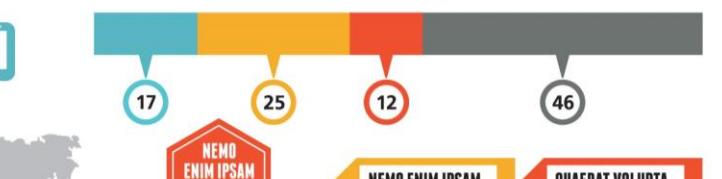
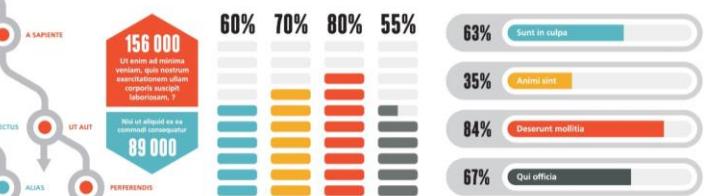
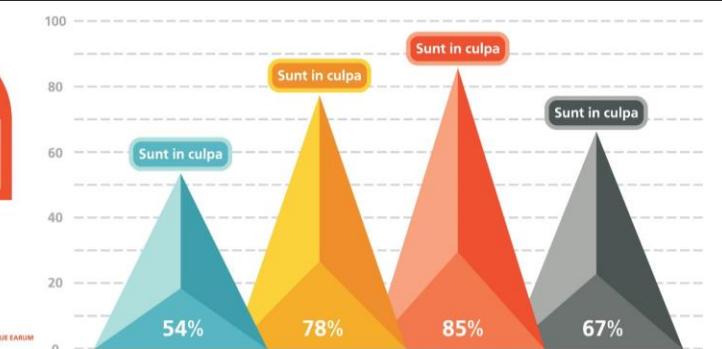


**125 000**

**REPUDIANDAE  
NON RECUSANDAE  
QUIA VOLUPTAS SIT**

ET HARUM QUIDEM

Rerum facilis est et expedita  
distinctio. Nam libero tempore,  
cum soluta nobis est eligendi opt



# Data-Driven Decision Making

## (The Future)





# The home of the U.S. Government's open data

Here you will find data, tools, and resources to conduct research, develop web and mobile applications, design data visualizations, and [more](#).

## GET STARTED

SEARCH OVER 196,465 DATASETS

Federal Student Loan Program Data



## BROWSE TOPICS



Agriculture



Climate



Consumer



Ecosystems



Education



Energy



Finance



Health



Local  
Government



Manufacturing



Maritime



Ocean



Public Safety

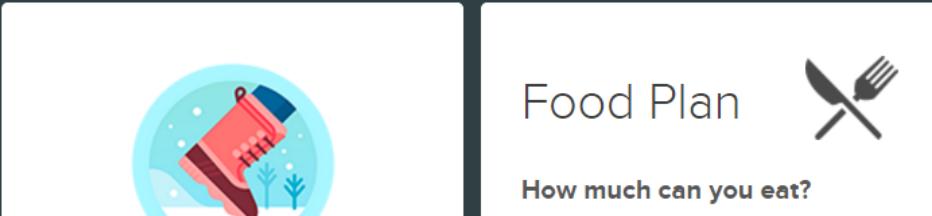
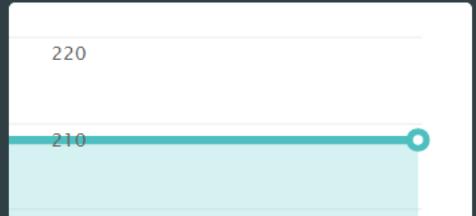
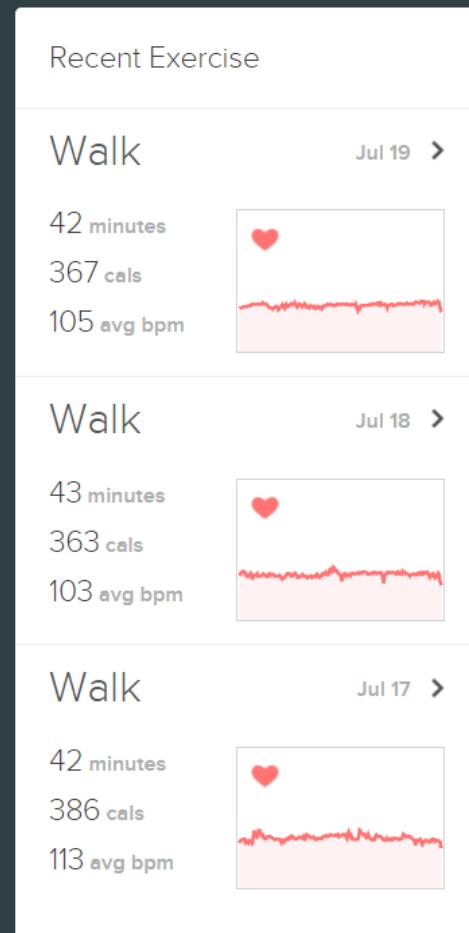
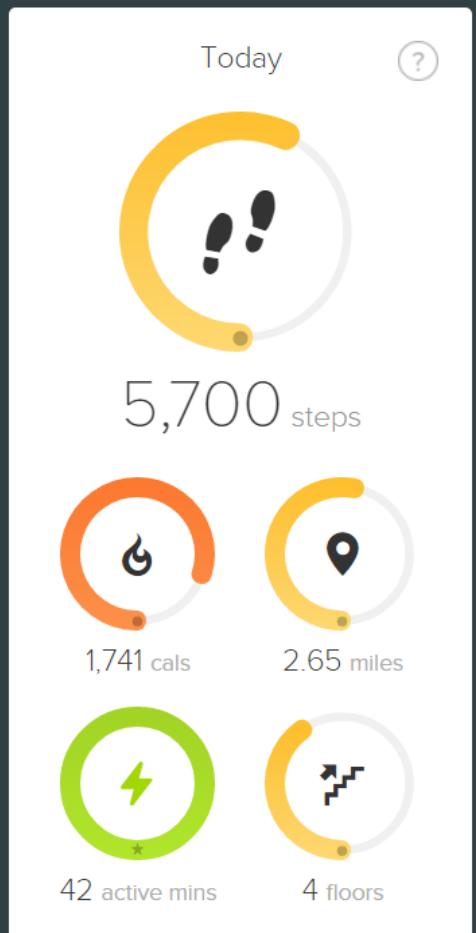


Science &  
Research



Today JULY 19

Last Sync: 8 mins ago



# Retail Analysis Sample

[Share Dashboard](#)

Ask a question about the data on this dashboard

Total Stores

104

This Year's Sales

\$22.05M

This Year's Sales

BY CHAIN



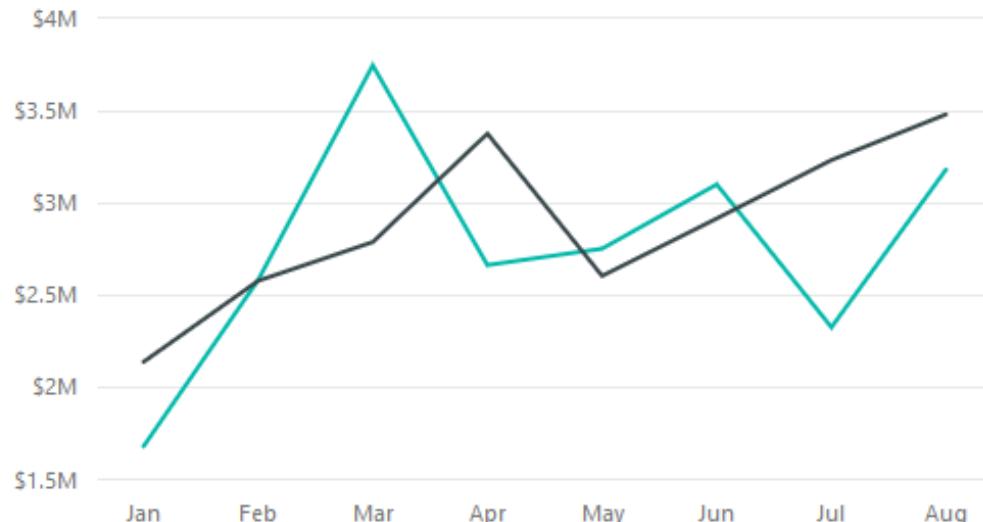
New Stores Opened This Year

10

This Year's Sales, Last Year's Sales

BY FISCAL MONTH

This Year Sales    Last Year Sales



Sales Per Sq Ft, Total Sales Variance %, This Year's Sales

BY DISTRICT

District    FD - 01    FD - 02    FD - 03    FD - 04    LI - 01    LI - 02    LI - 03



## ⌚ AW\_DW\_InternetSales\_2.xlsx

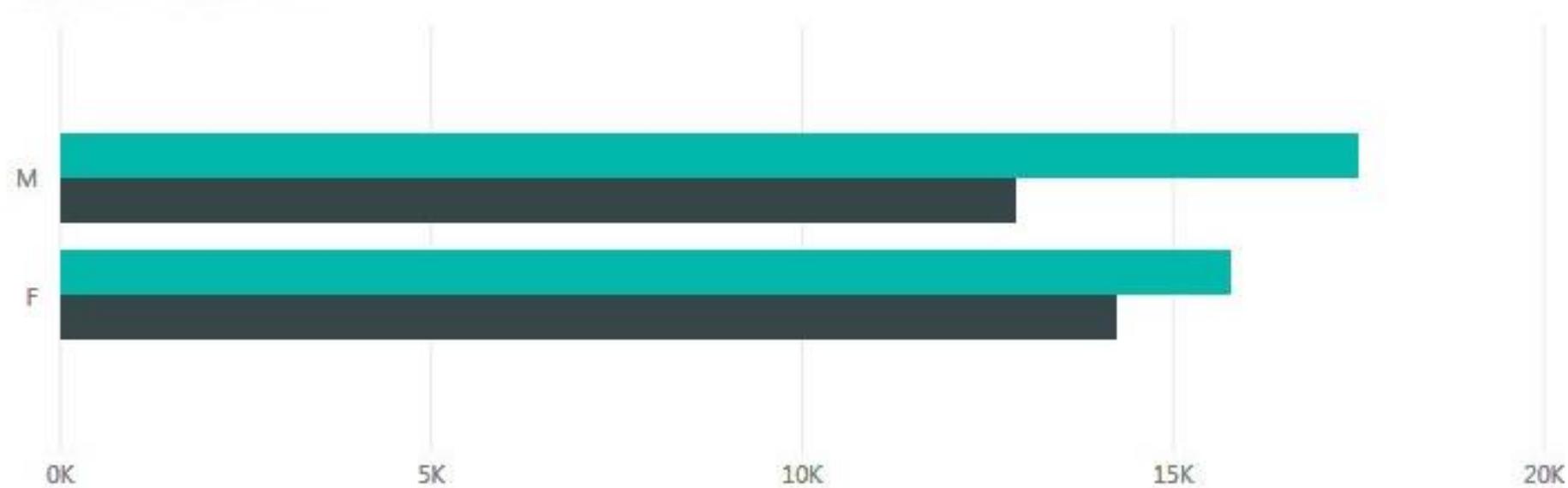
sales by gender and marital status

Show gender, marital status, and number of AWDW internet sales

Show me sales  
by gender and  
marital status.

Count of AWDWInternetSales by Gender and MaritalStatus

MaritalStatus ● M ● S



Source: AW\_DW\_InternetSales\_2









4% higher productivity

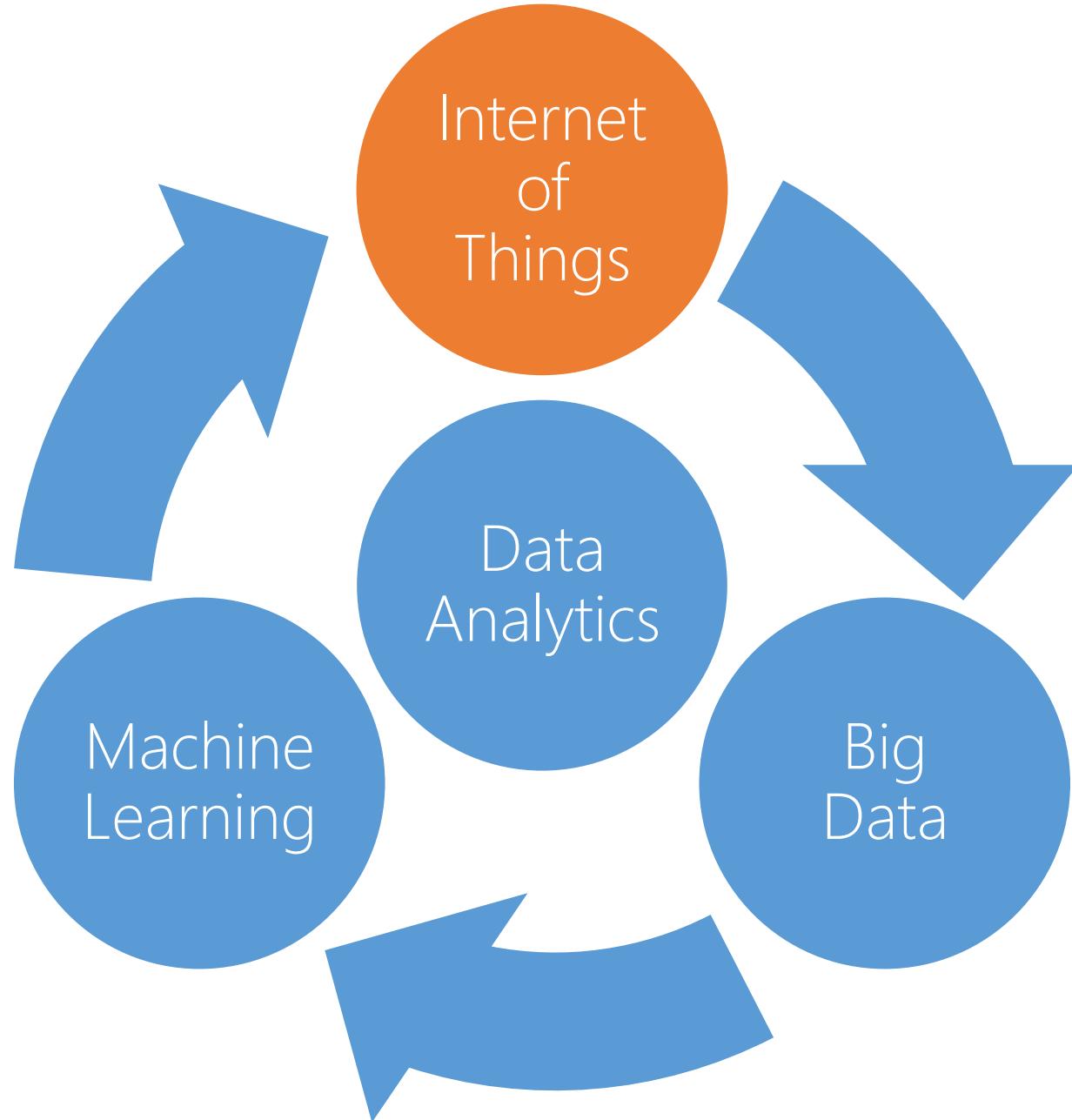
6% higher profits





Empowering people to make better decisions is not the end goal...

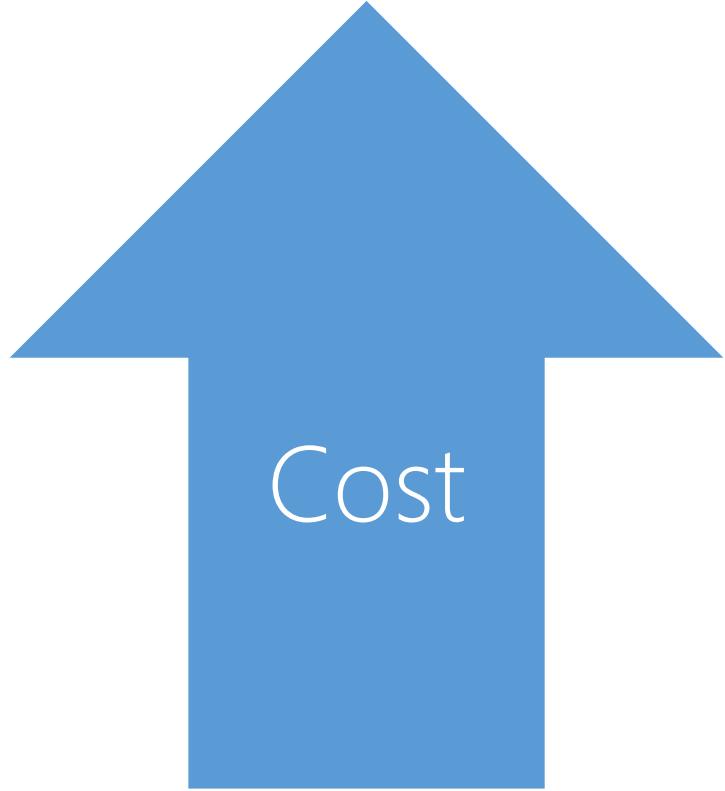
... it's just the beginning



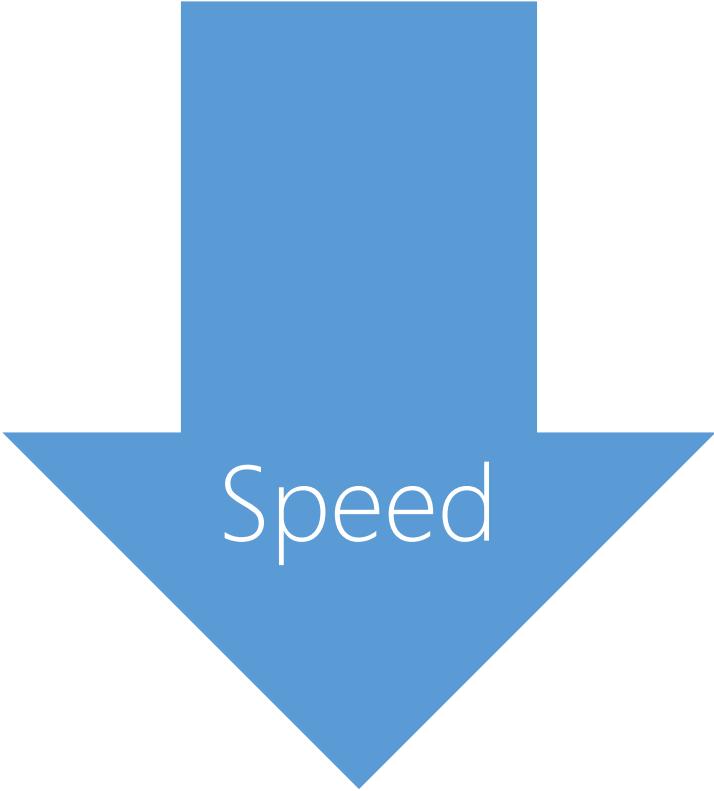
# The Internet (The Past)



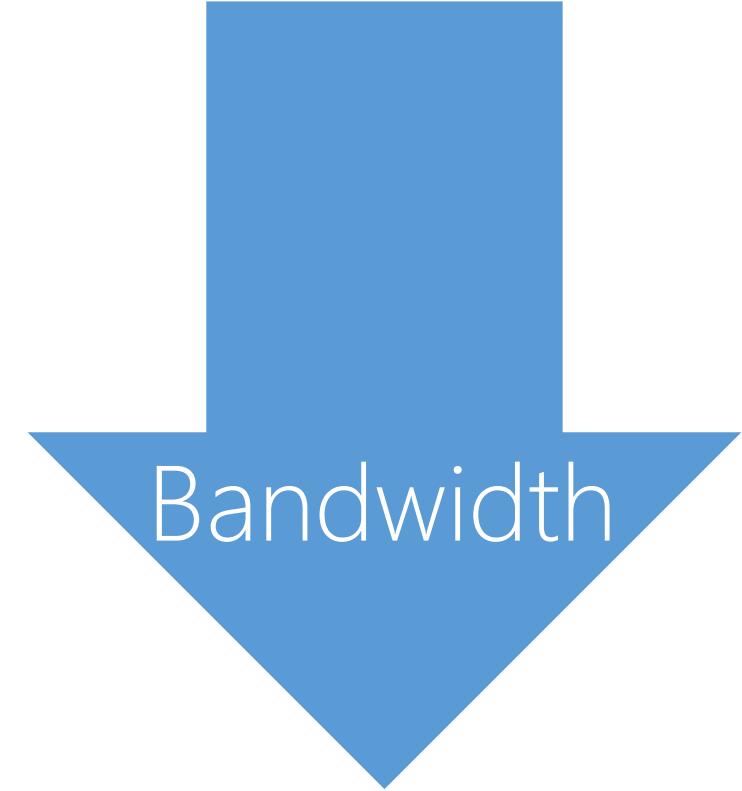




Cost



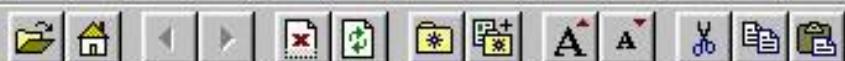
Speed



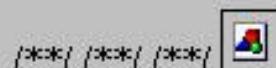
Bandwidth

## Wiki does not exist

File Edit View Favorites Help



Address: <http://en.wikipedia.org/>



# Wiki does not exist

***From Meta, a wiki about Wikimedia***

This wiki does not exist yet. Perhaps you are looking for one of our other projects:

## Projects

[Complete list of wikimedia projects](#)

[Proposals of new projects](#)

## Wiktionaries

### Untitled Document - Microsoft Internet Explorer

File Edit View Favorites Tools Help

## Sign Up for our E-Mail Newsletter

First name:

Last name:

Title:

Organization:

nonprofit  foundation  consulting firm  other

Street address:

City:

State:

Country:

Zip or postal code:

E-mail address:  @

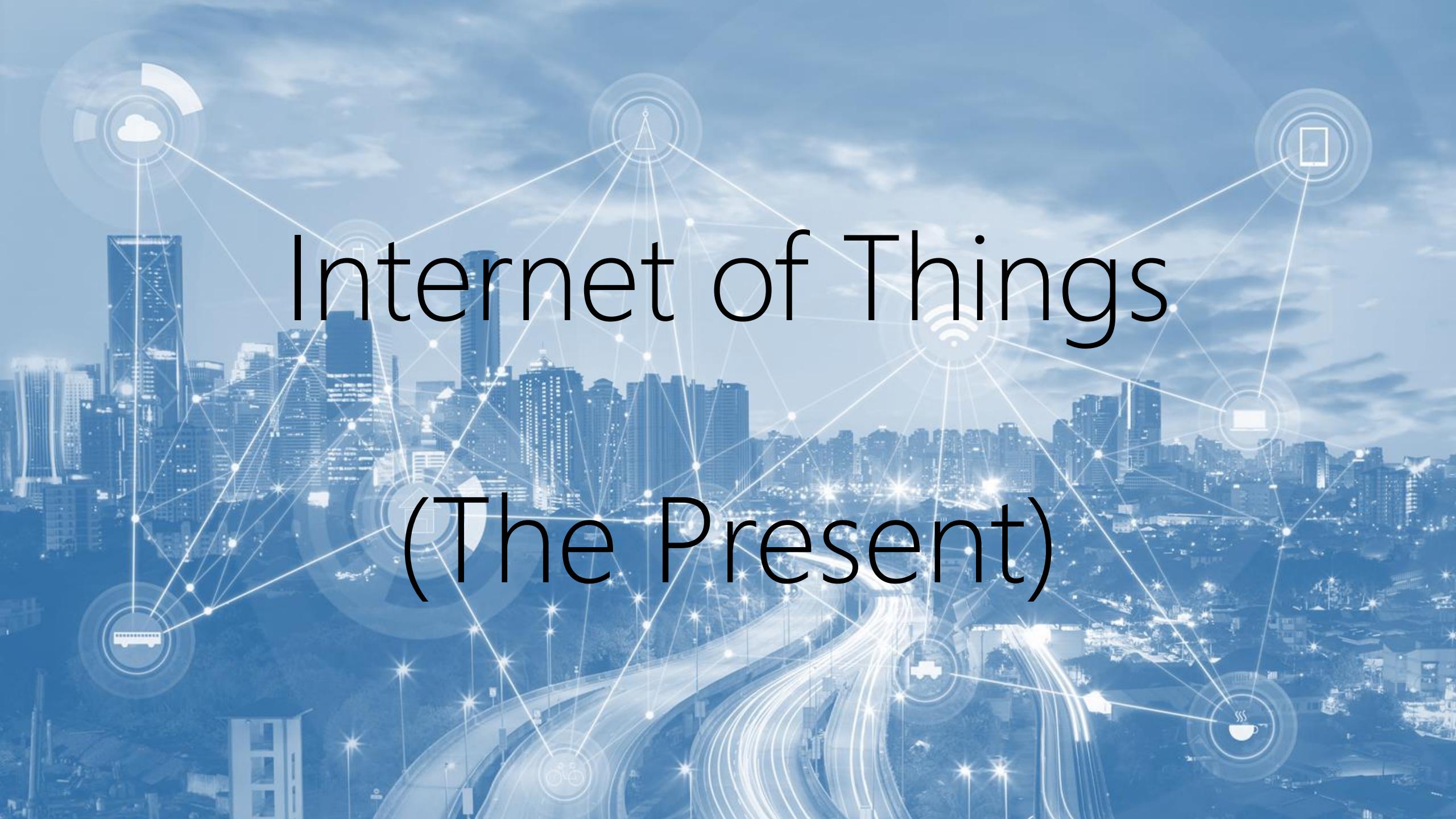
Voice phone: ()  Ext.

Fax: ()

I would prefer to receive information via

E-mail  Fax

Internet



# Internet of Things

## (The Present)







# REMOTE HOME CONTROL

ONLINE HOME AUTOMATION



CLIMATE



LIGHTING



SECURITY



ENTERTAINMENT

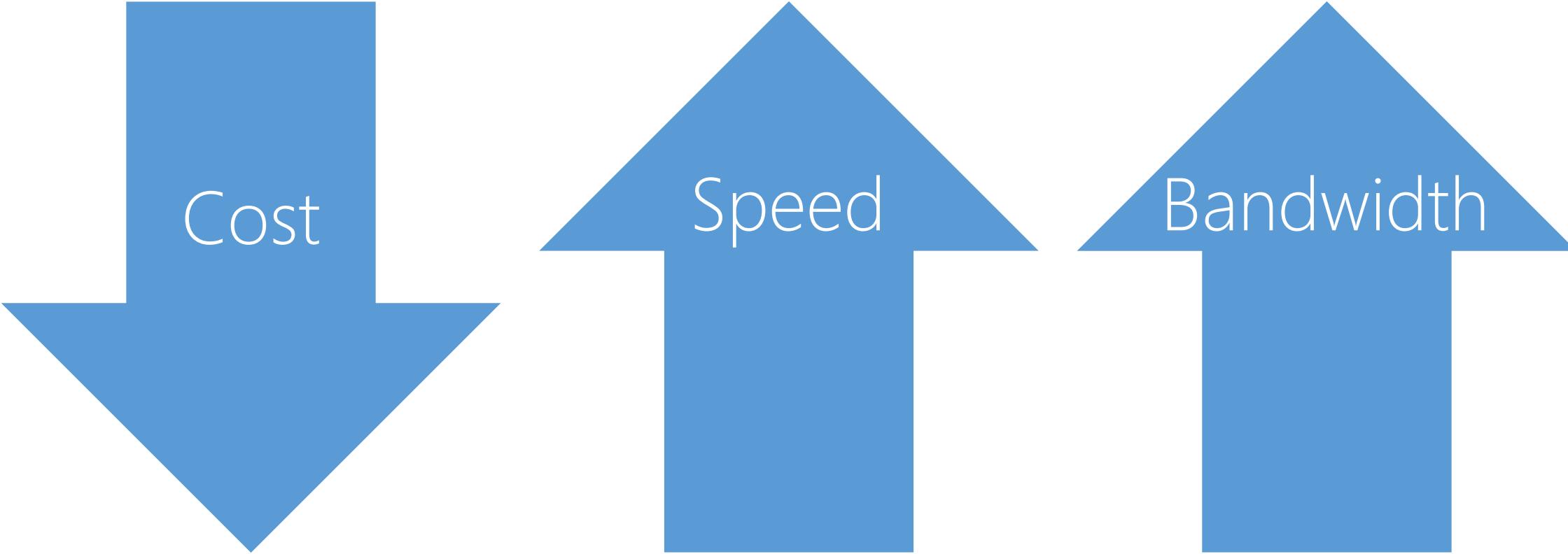


ECO MODE

NORMAL

OFF



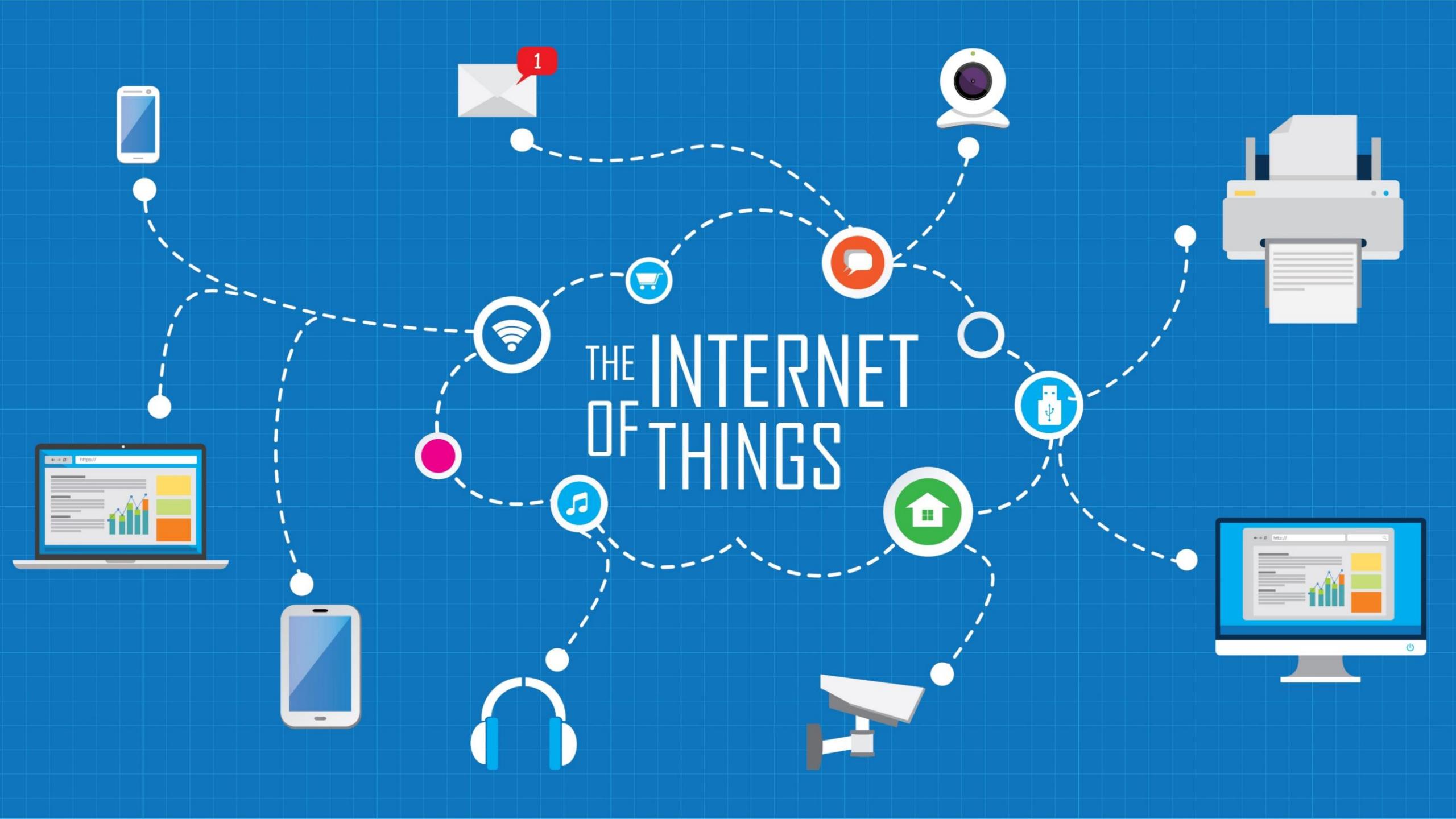


Cost

Speed

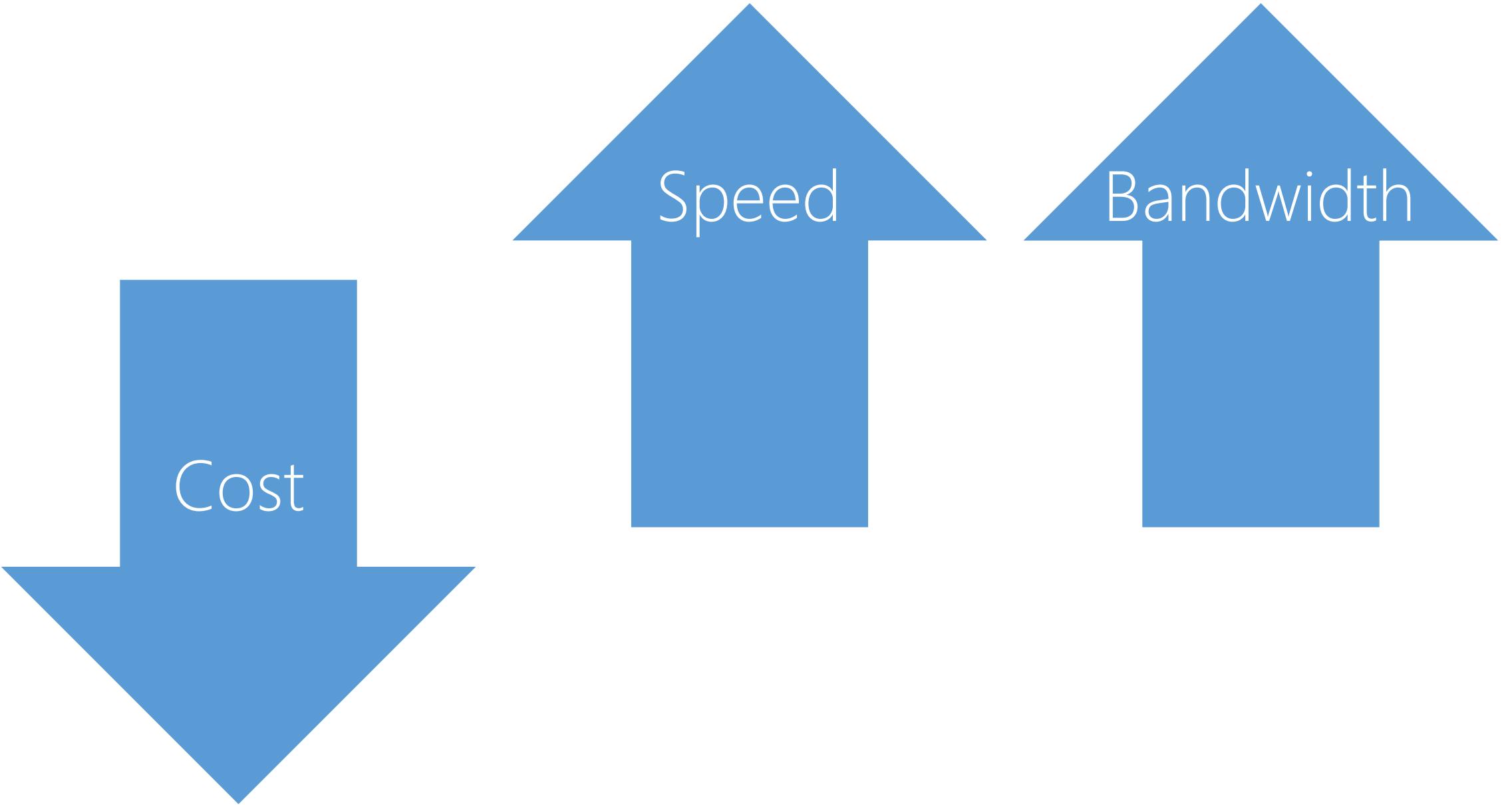
Bandwidth

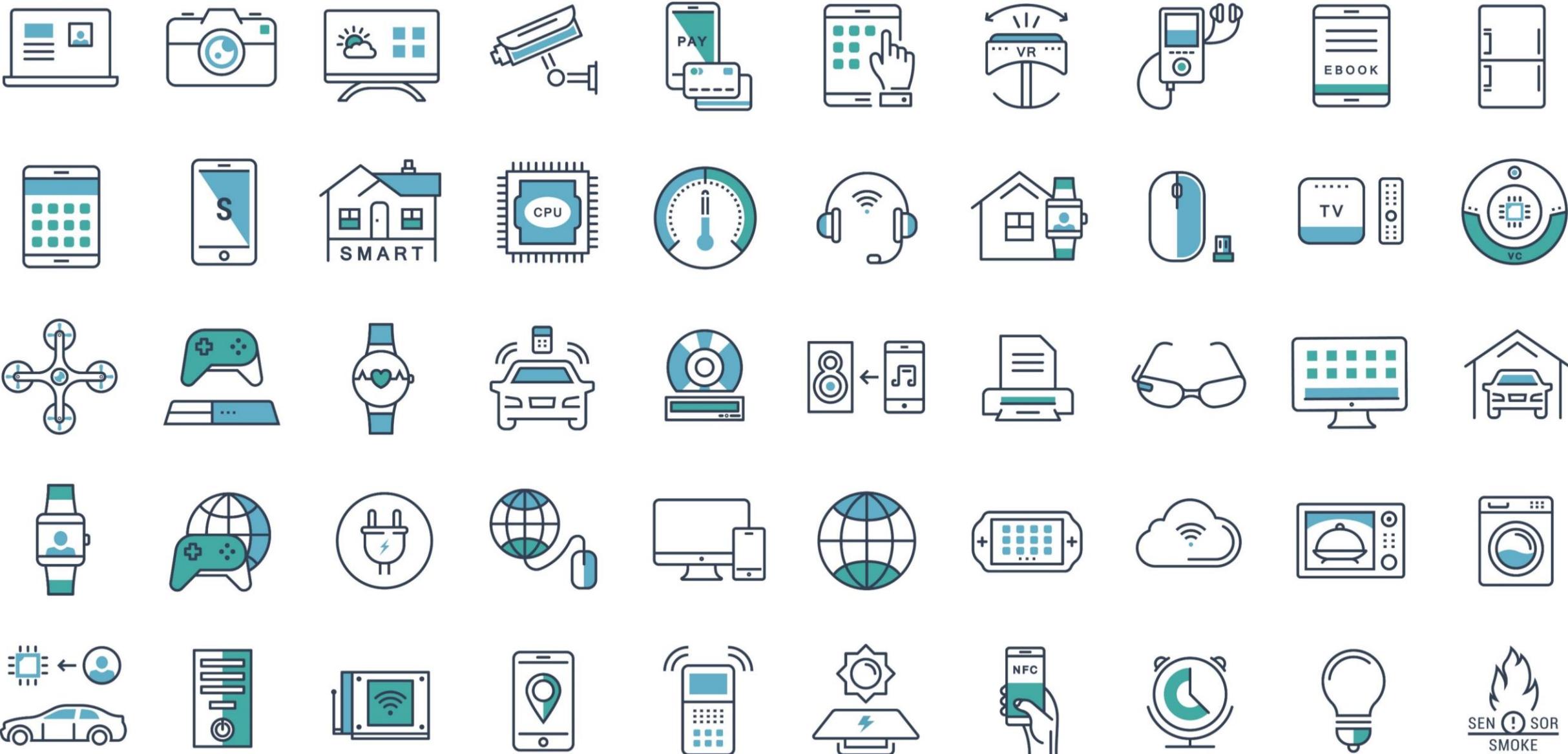
# THE INTERNET OF THINGS



# Internet *is* Everything

(The Future)







# FUN GAME 1

Is It IoT?

Is It IoT?



# Bluetooth



YES!





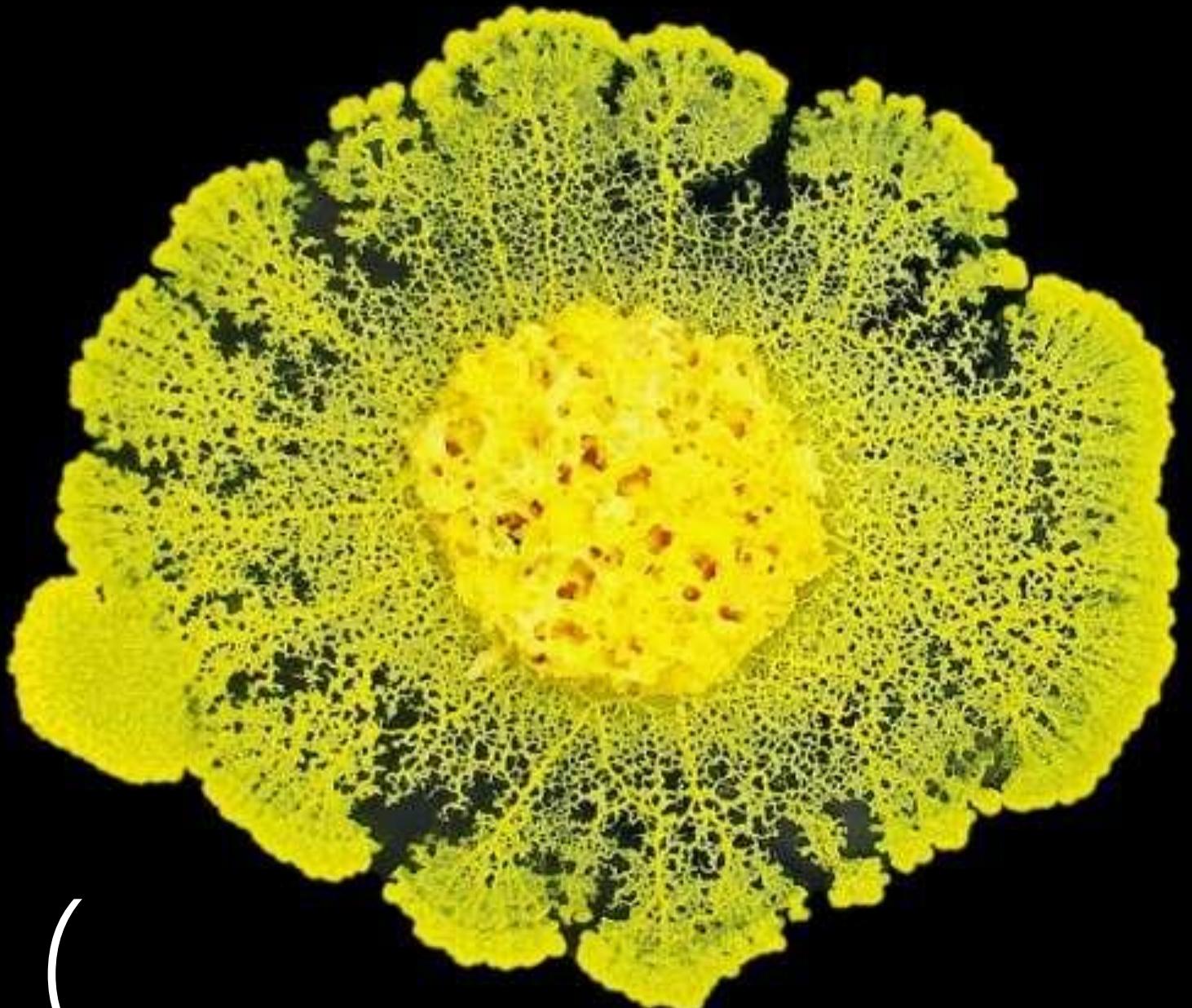
Is It IoT?

# YES!

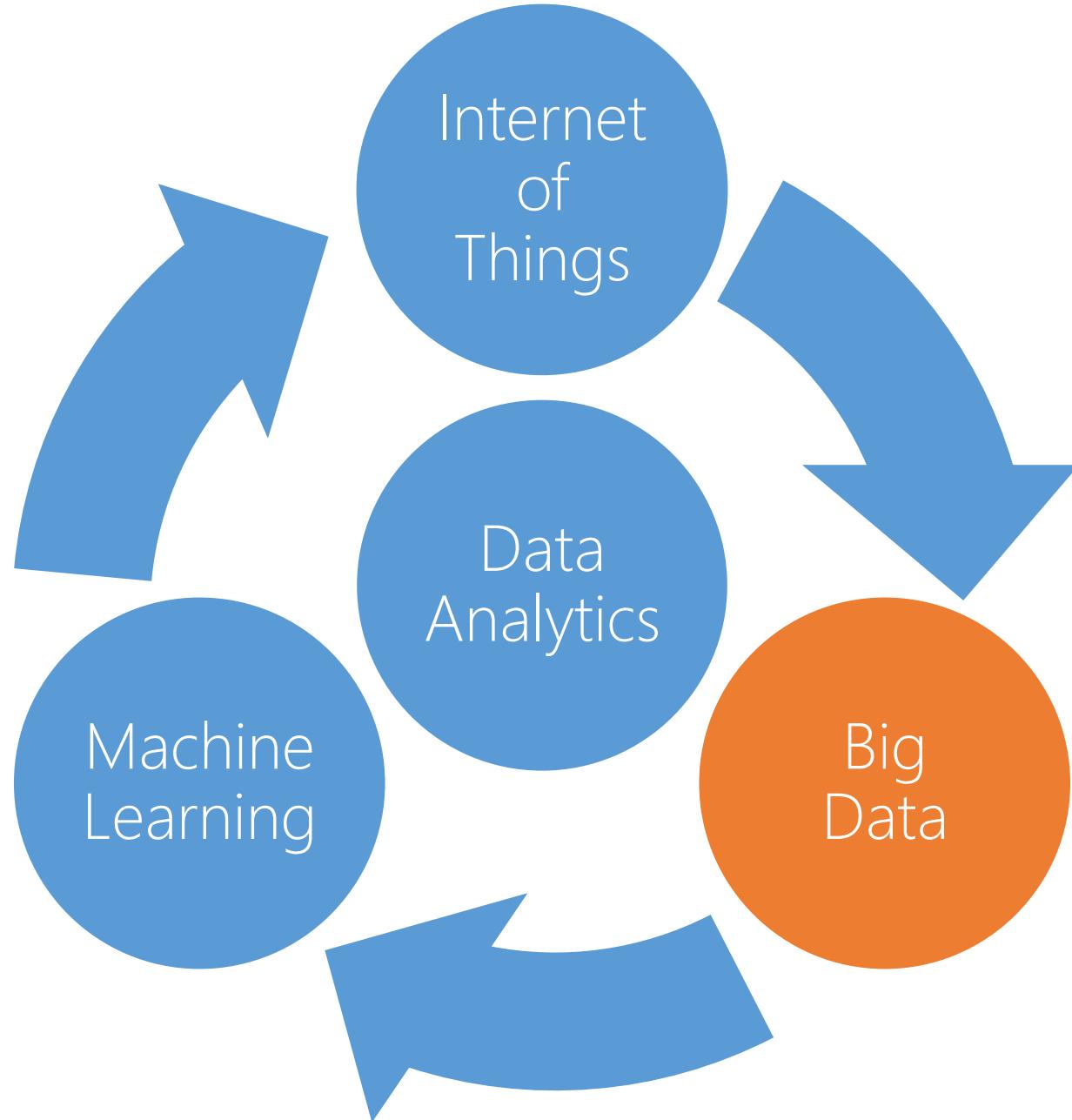




Is It IoT?



NO : (



# Data (The Past)

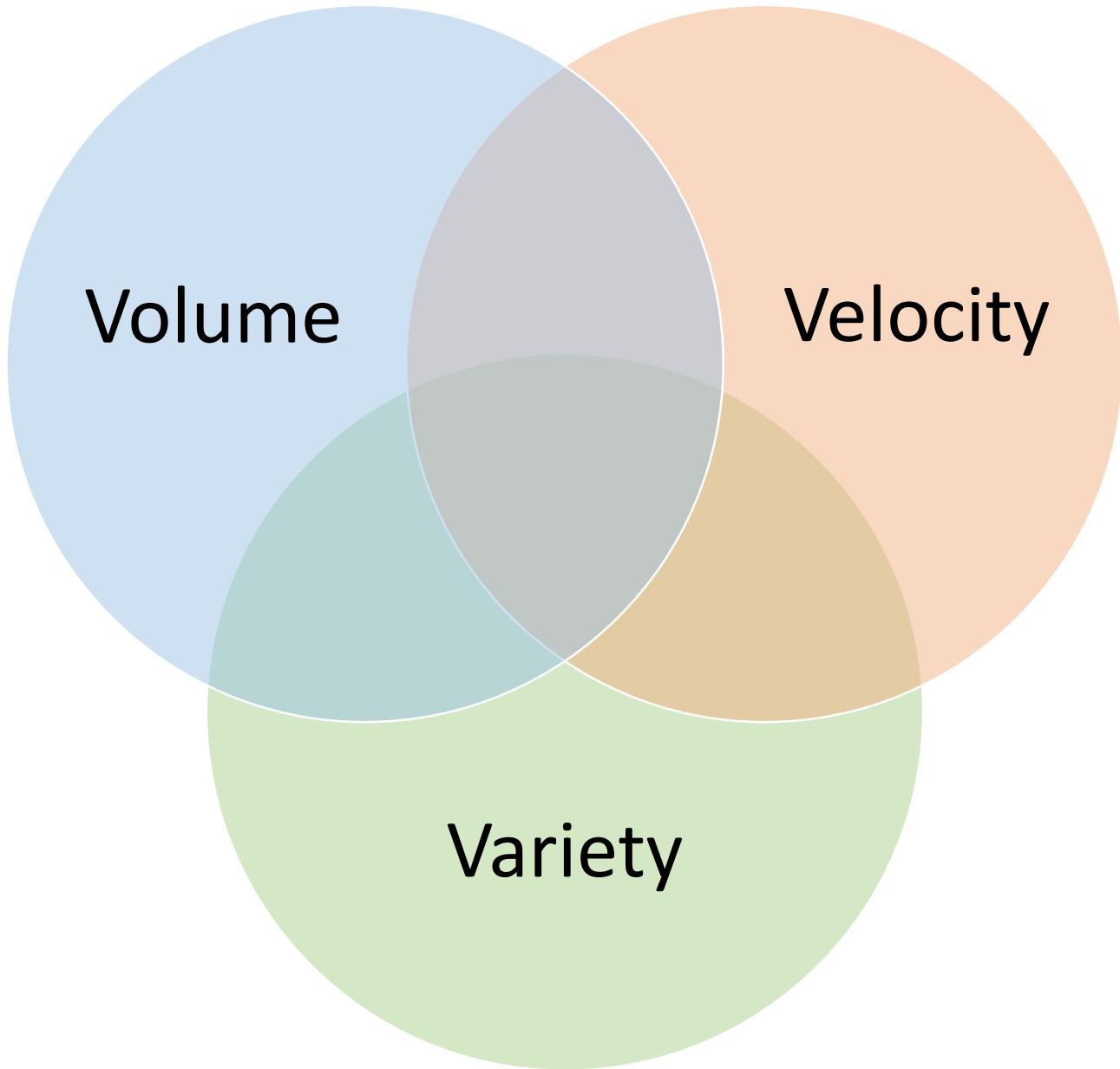






A perspective view of a massive server farm, likely a data center. The image shows numerous rows of tall, blue server racks stretching into the distance. The racks are arranged in a grid pattern, creating a sense of depth and scale. The lighting suggests a bright, possibly overcast day, with the blue of the servers and the sky being the dominant colors.

Big Data  
(The Present)



A photograph showing a long row of server racks in a data center. The racks are filled with black server units, each with multiple green LED lights indicating active status. The perspective is from a low angle, looking up at the rows of equipment.

Volume

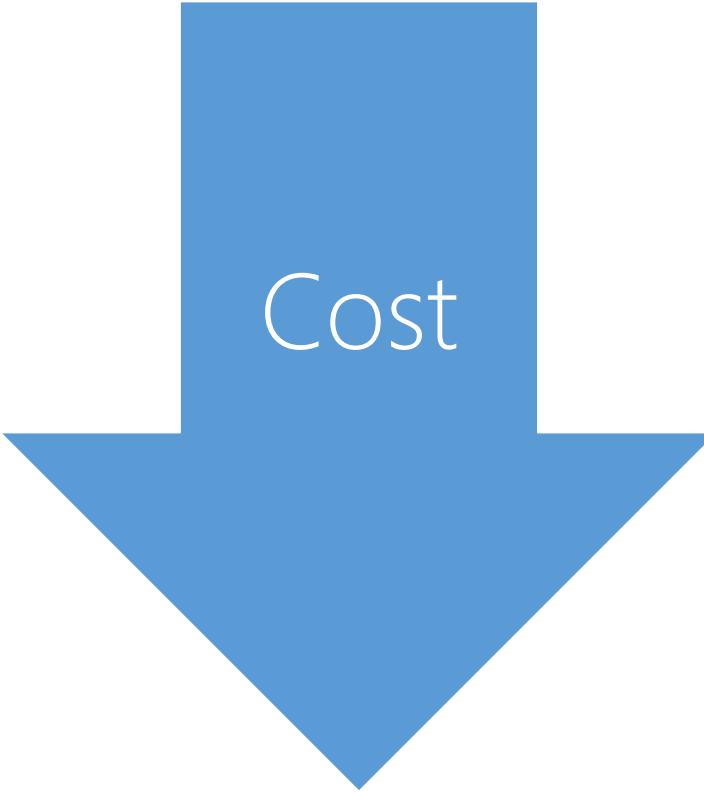
# Velocity



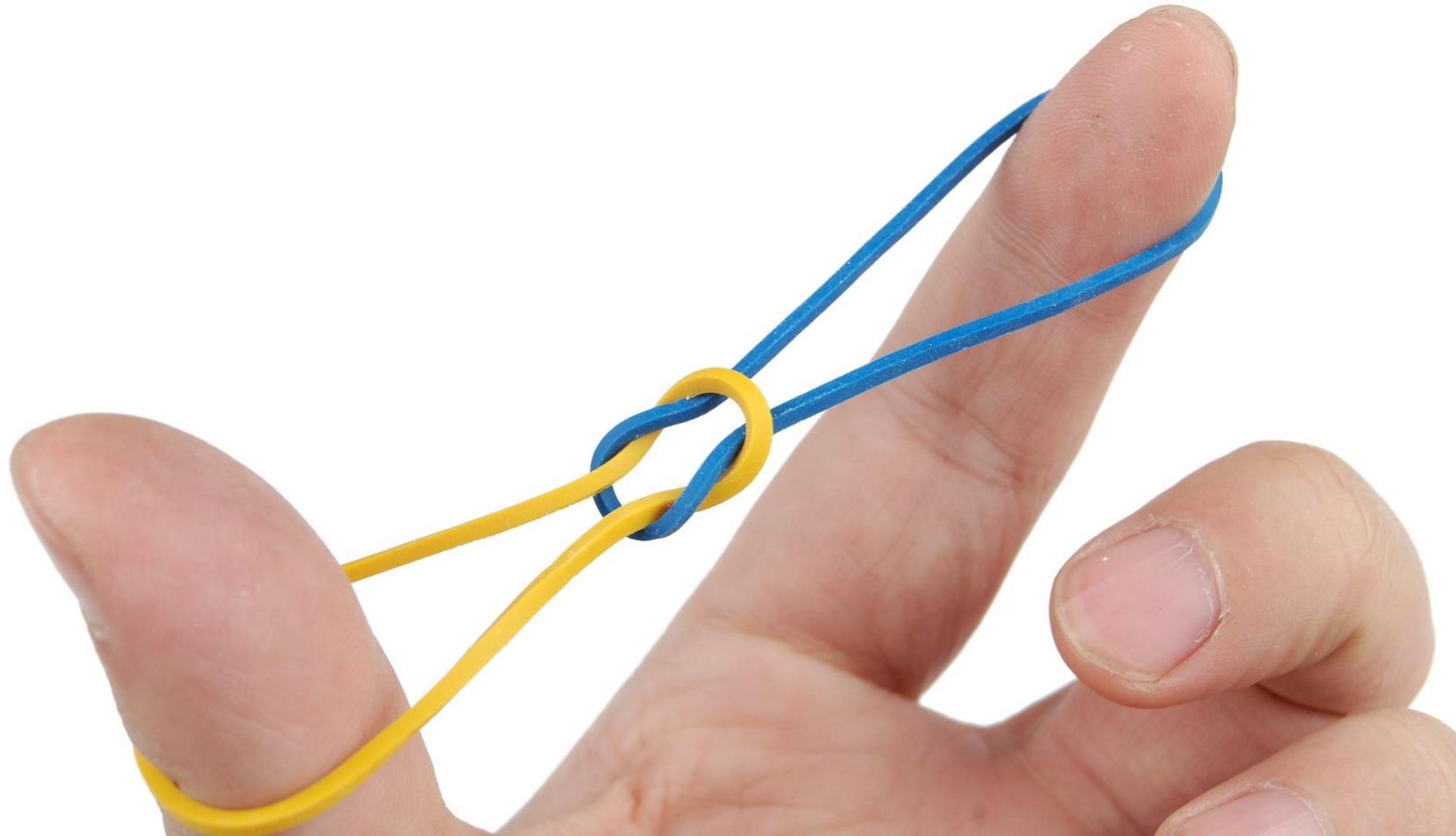
Variety

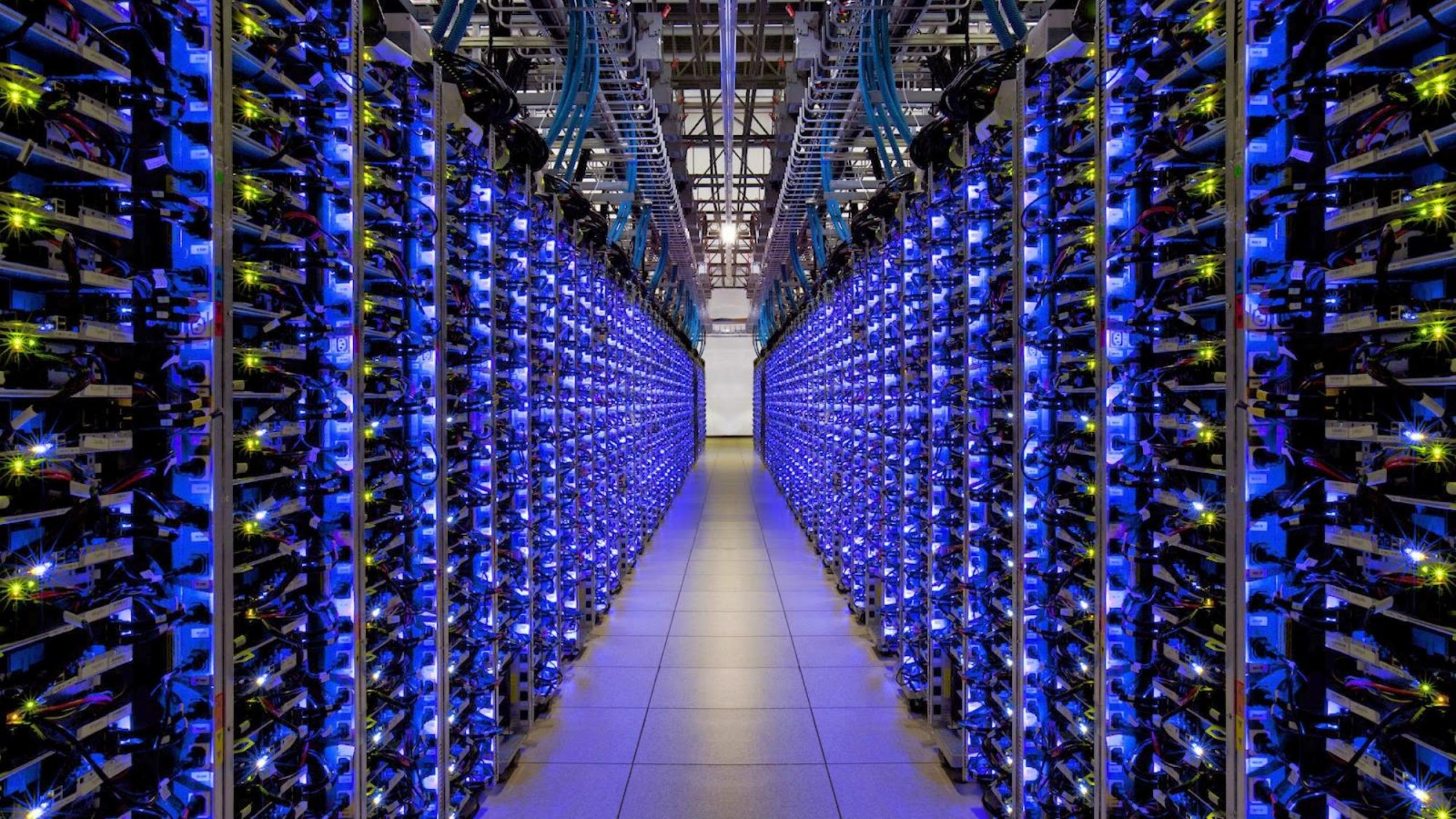


Just Data... Again  
(The Future)



Cost







Candy  
Cookies/Crackers

Food Vegetables  
Goods

Three  
Spices/Cake Mixes  
Butter Puddings

Cosmetics  
Household

## FUN GAME 2

Am I Smarter Than Big Data?

# What Do These Have In Common?





STELLA  
ARTOIS

STELLA  
ARTOIS

STELLA  
ARTOIS

HUGGIES

Natural  
Care

HUGGIES

One  
&  
Done  
Refresh  
ing

Cute  
Snug

# What Do These Three Things Predict?

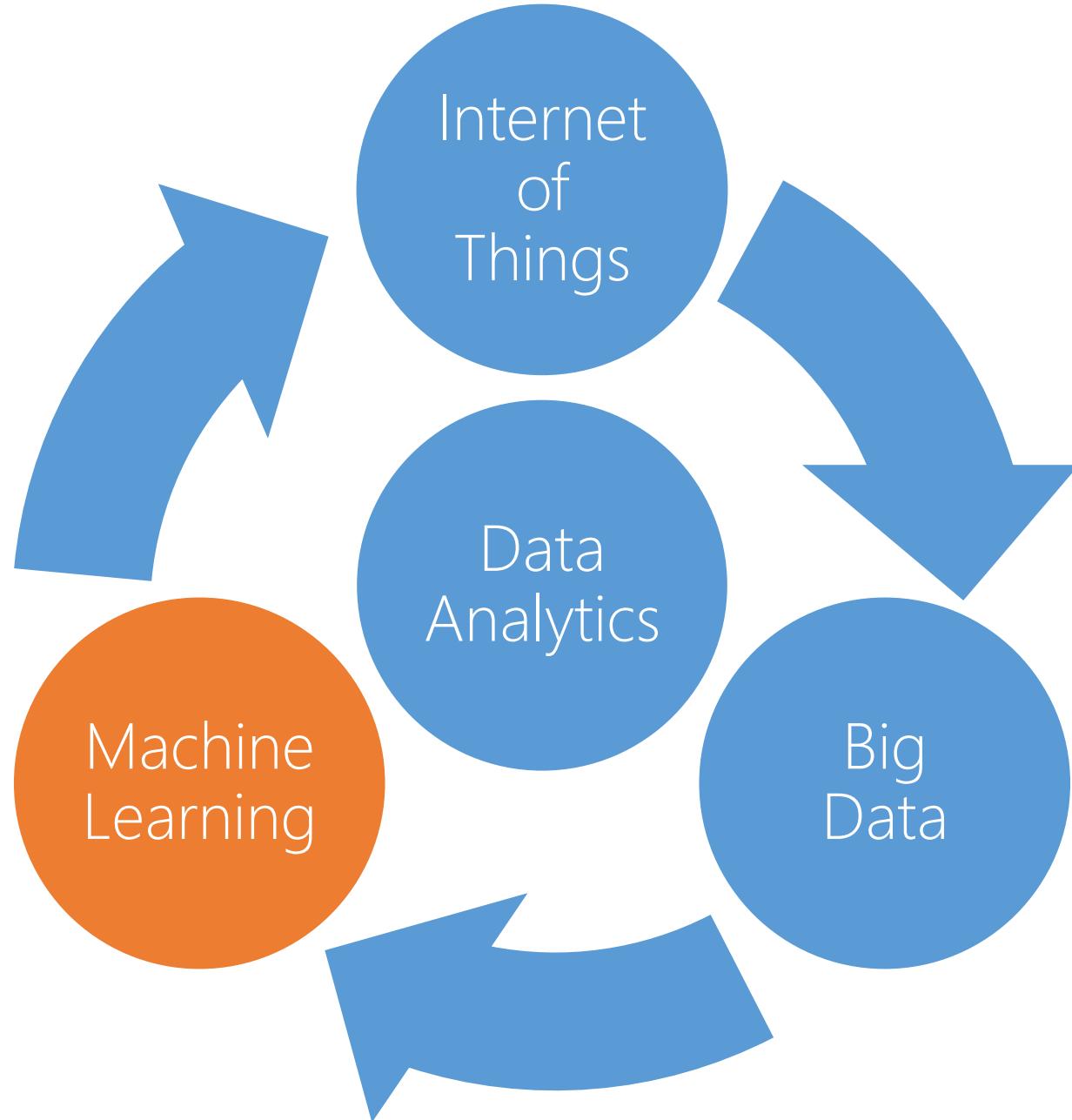




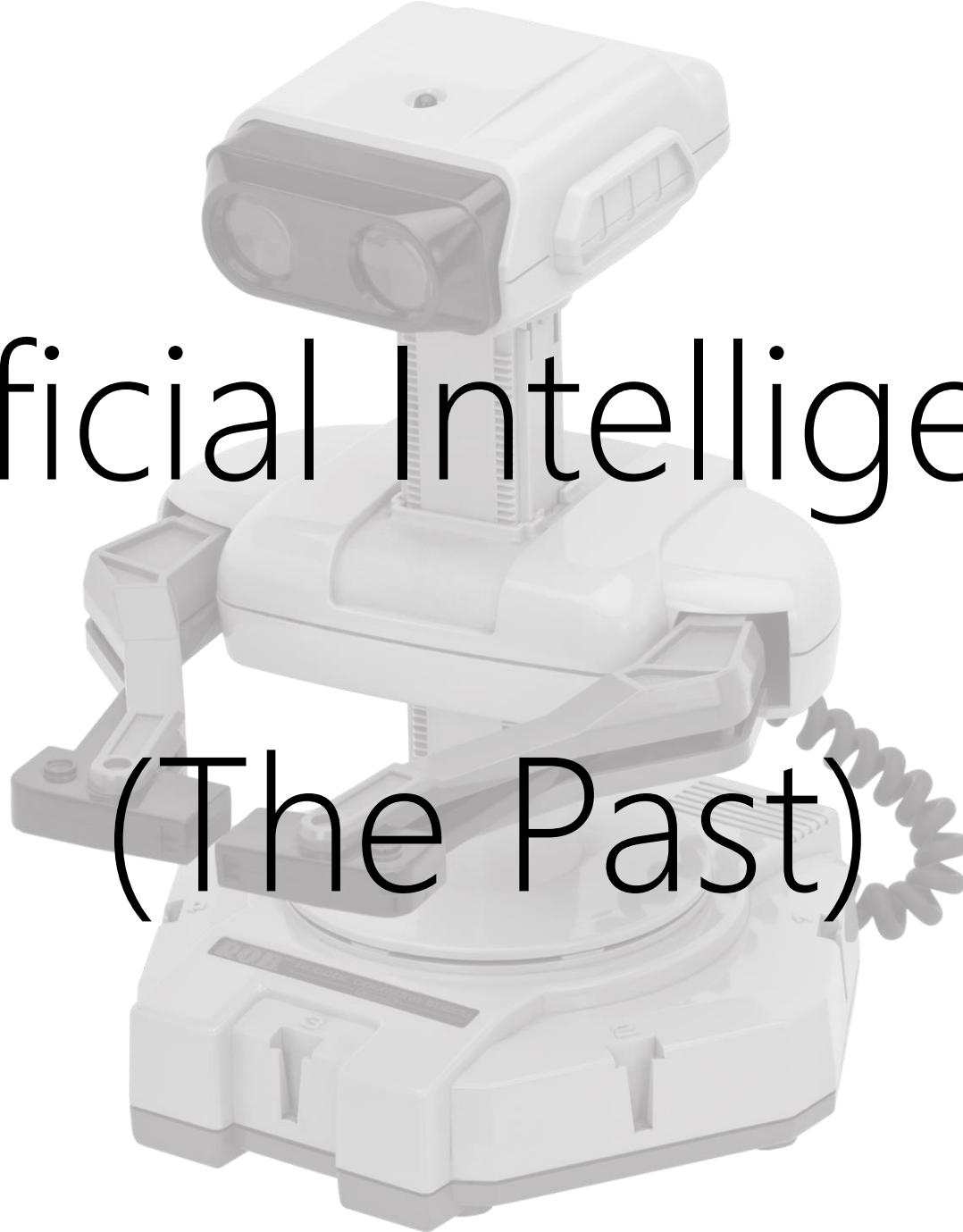
# What Do These Have In Common?





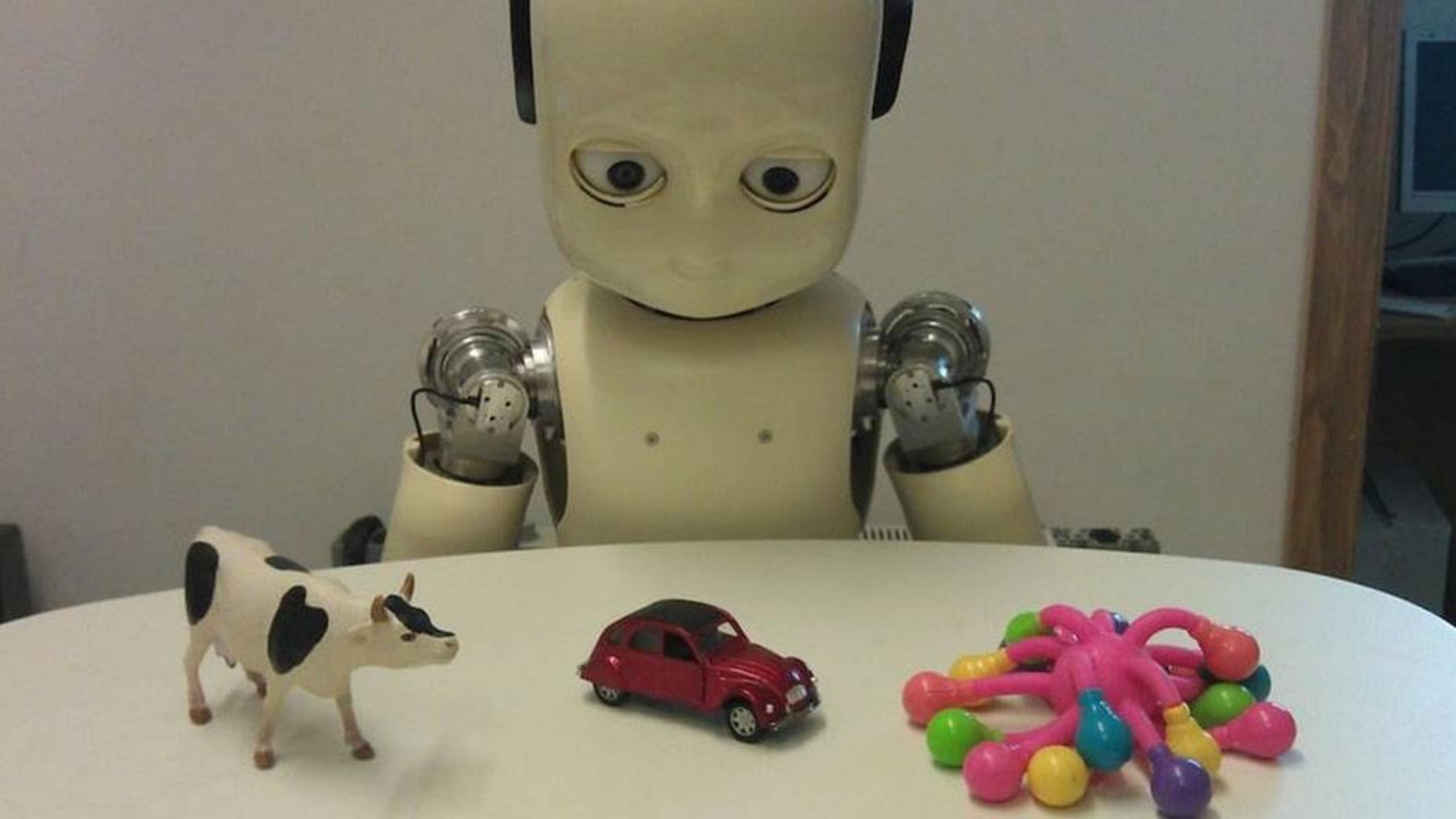


# Artificial Intelligence (The Past)

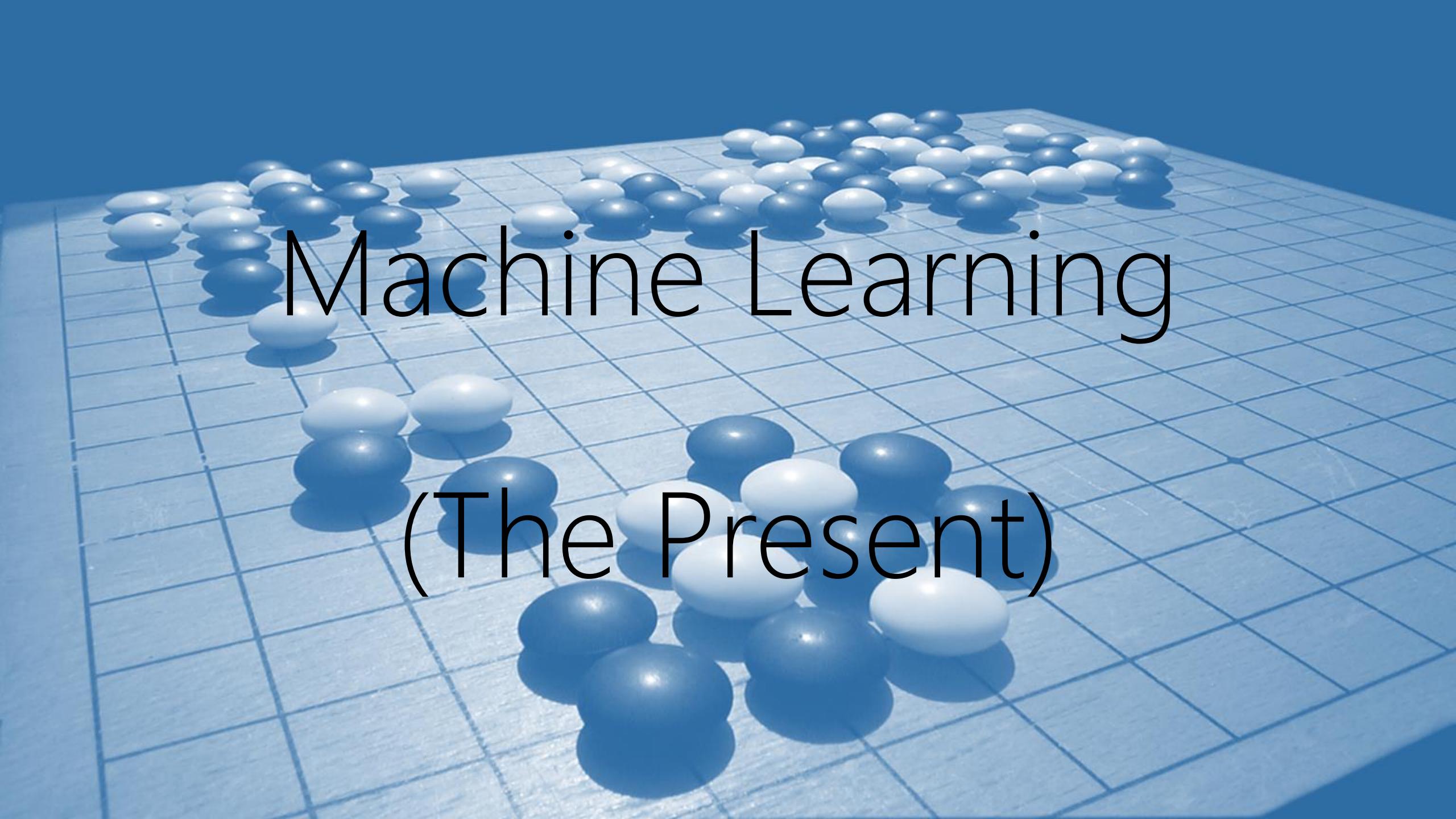




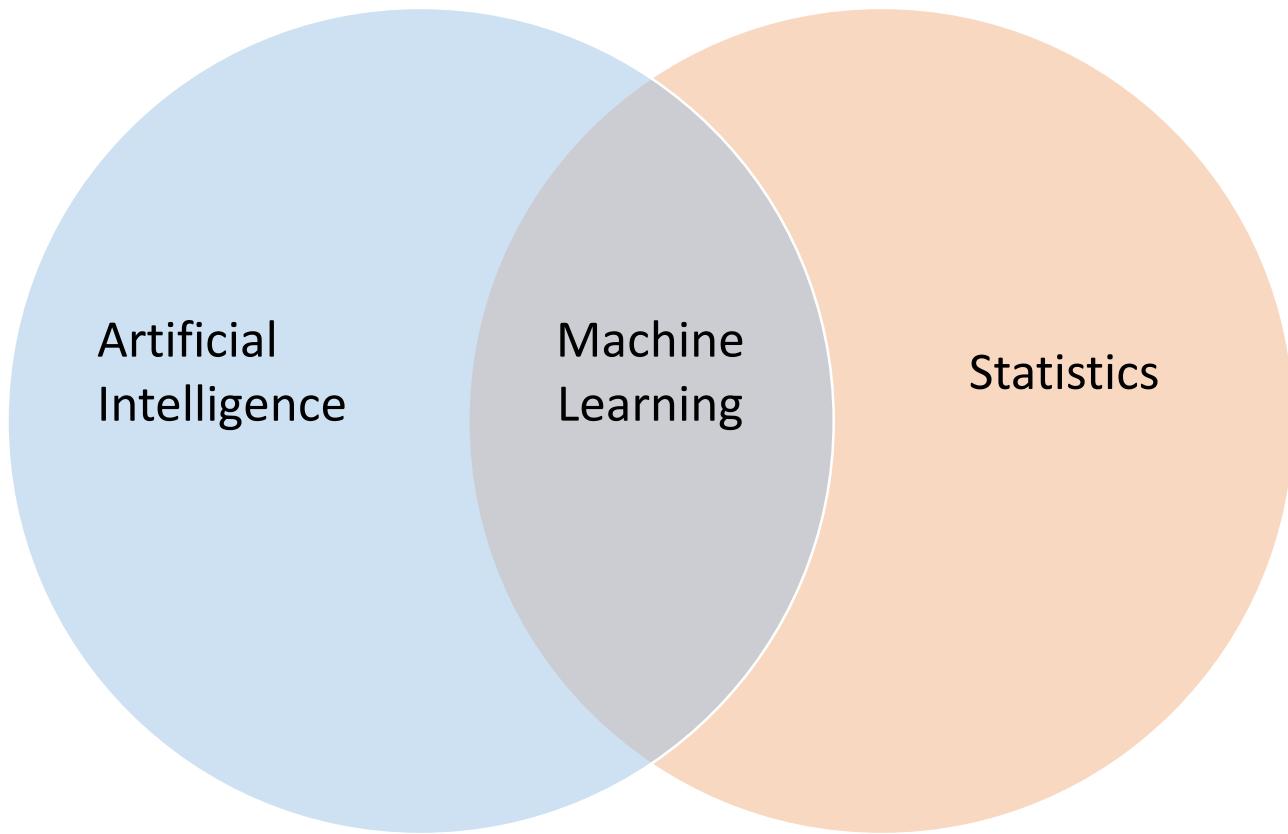


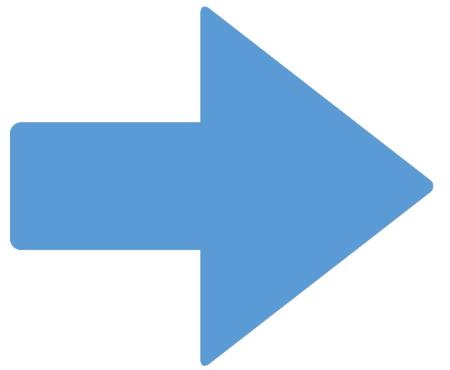
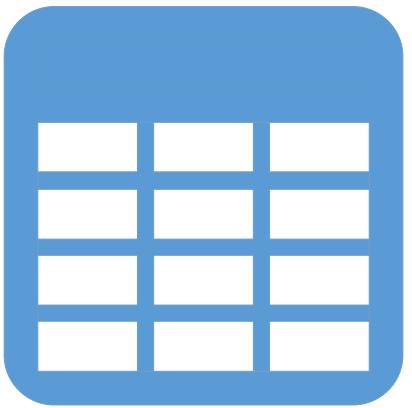
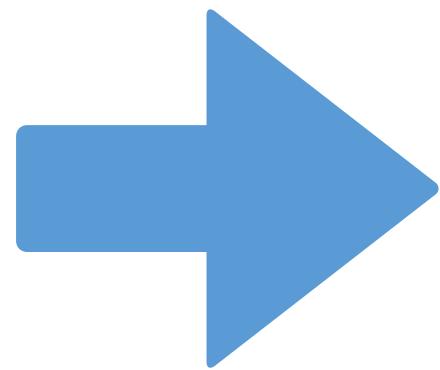


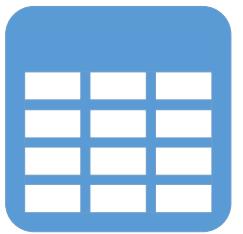




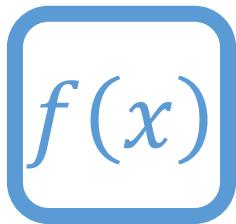
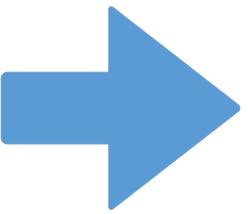
Machine Learning  
(The Present)



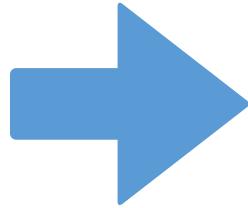
 $f(x)$ 



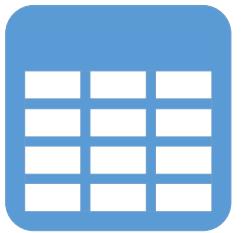
Data



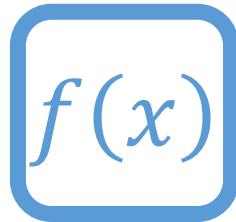
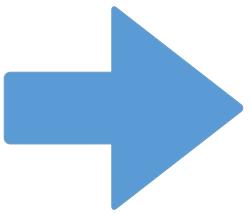
Function



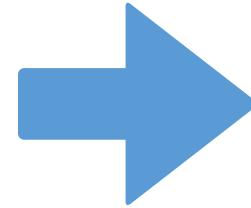
Prediction



Data



Function



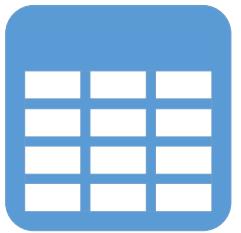
Prediction



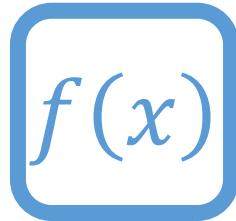
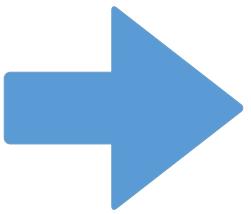
Cat



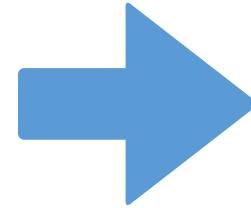
Dog



Data



Function



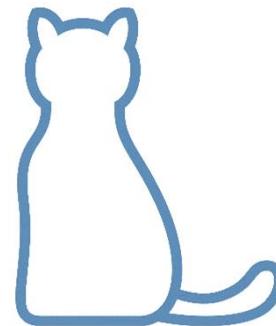
Prediction



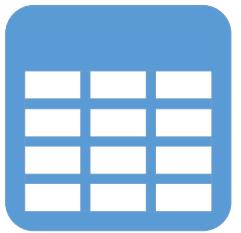
Cat



Dog



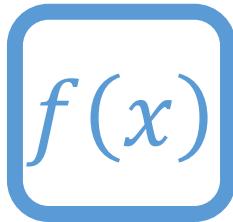
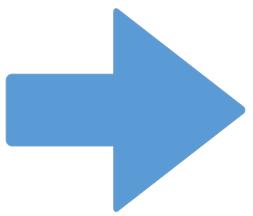
Is cat?



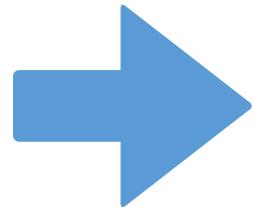
Data



Cat



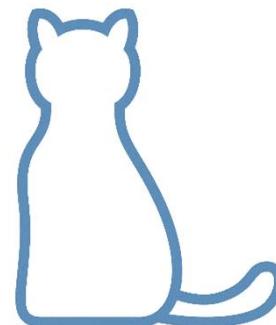
Function



Prediction



Dog



Is cat?



Yes

Franke hood

Wall cabinet

Refrigerator

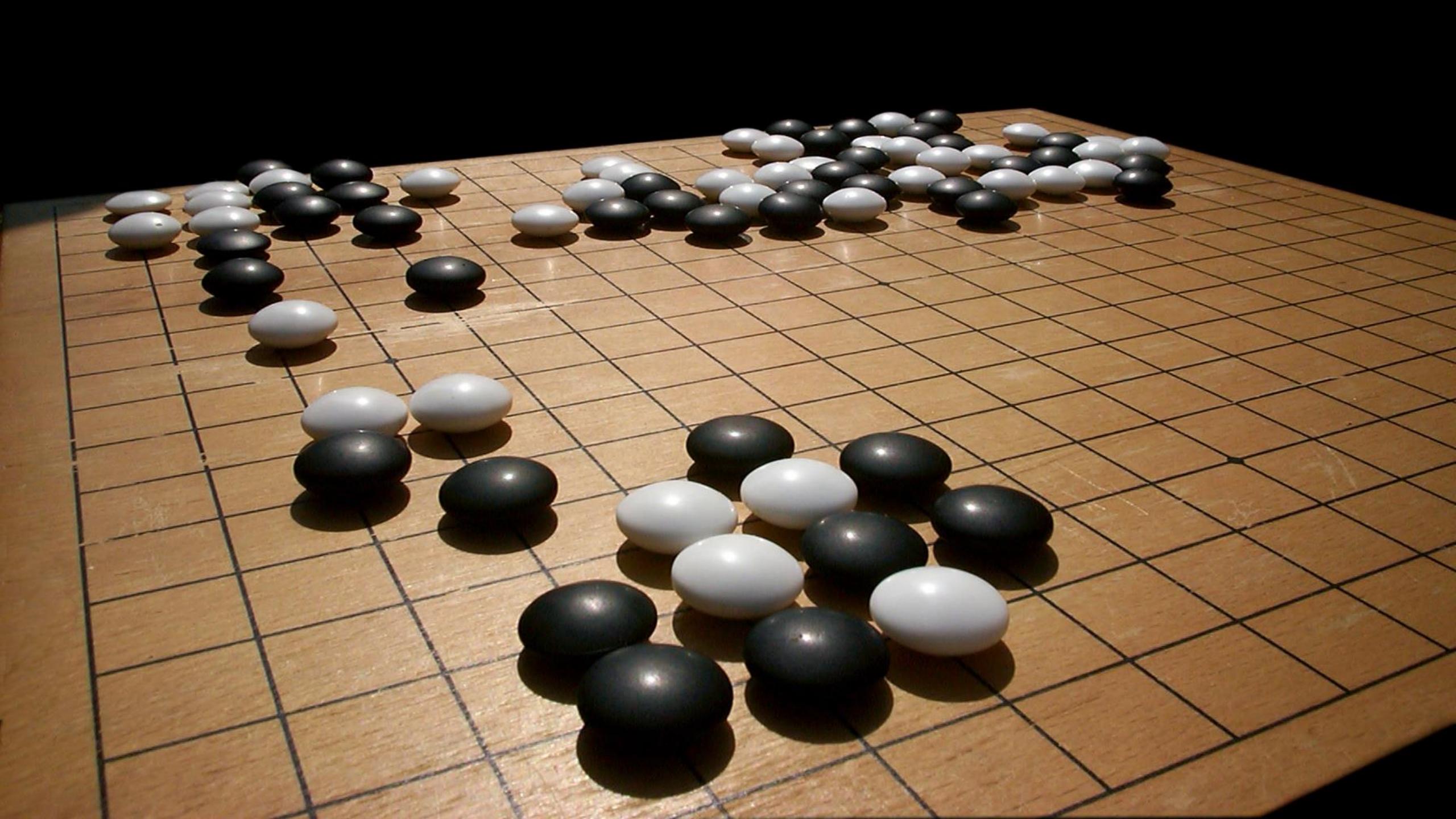
Range

Pot

Kettle

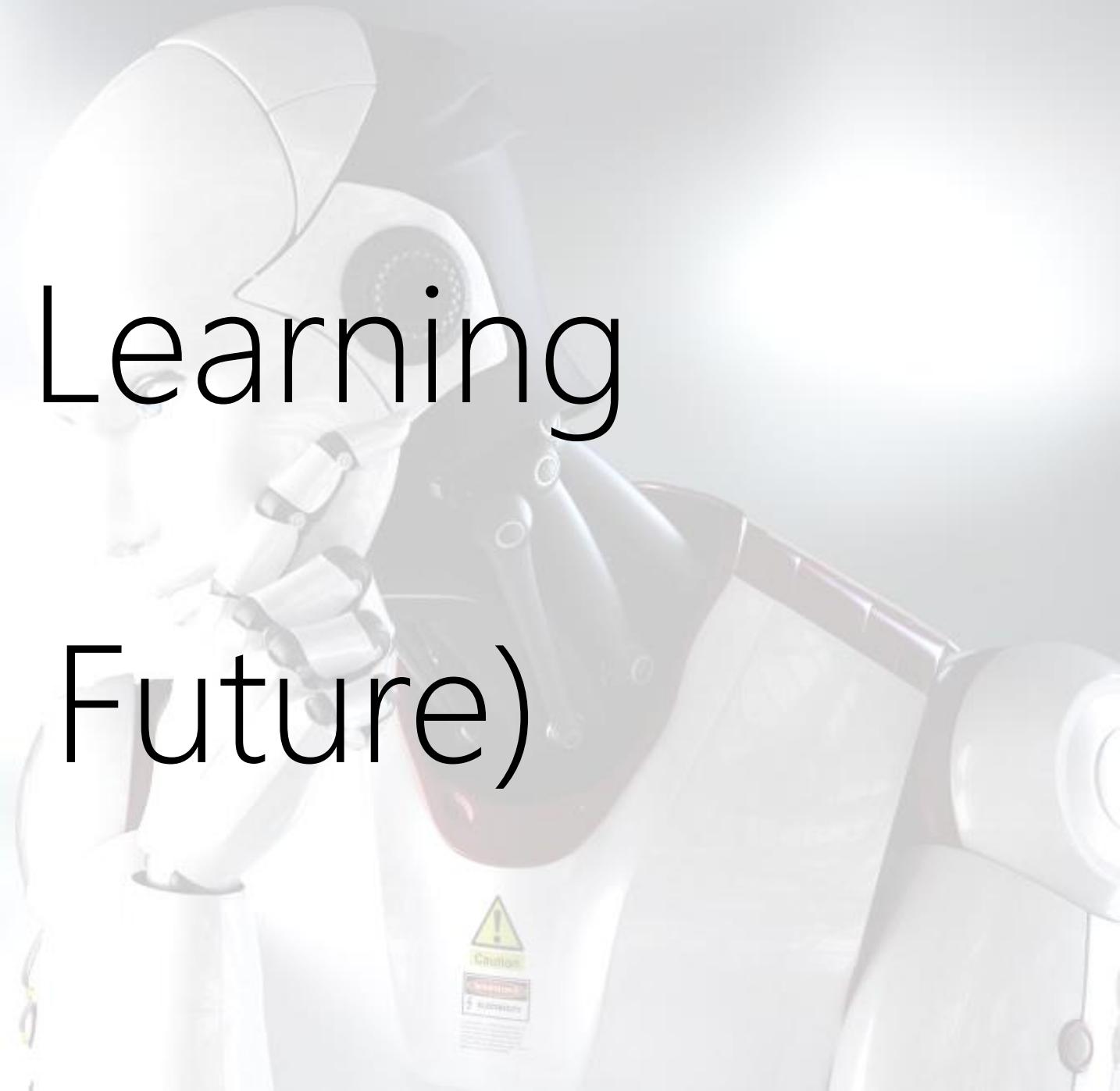
Teapot

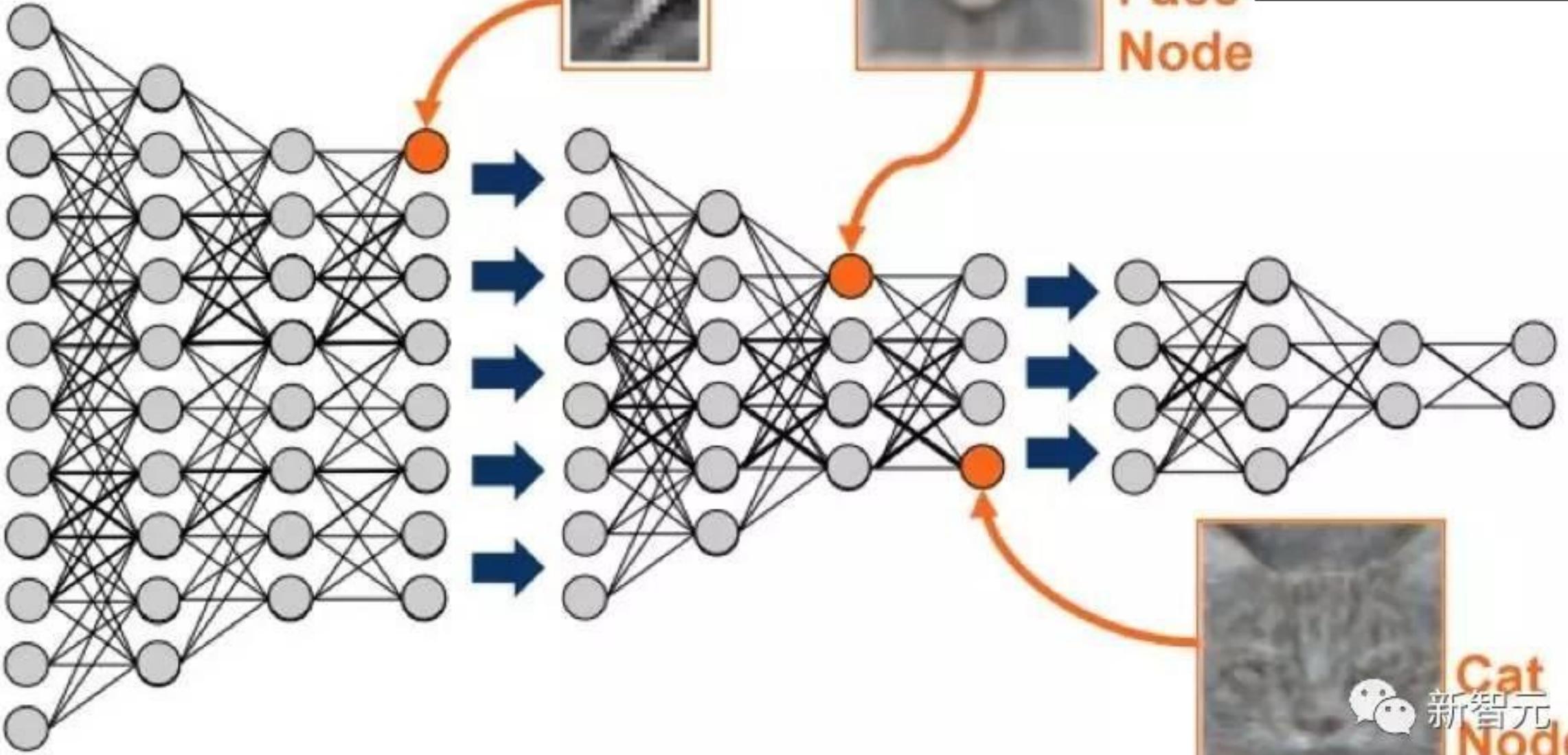
Cabinet table

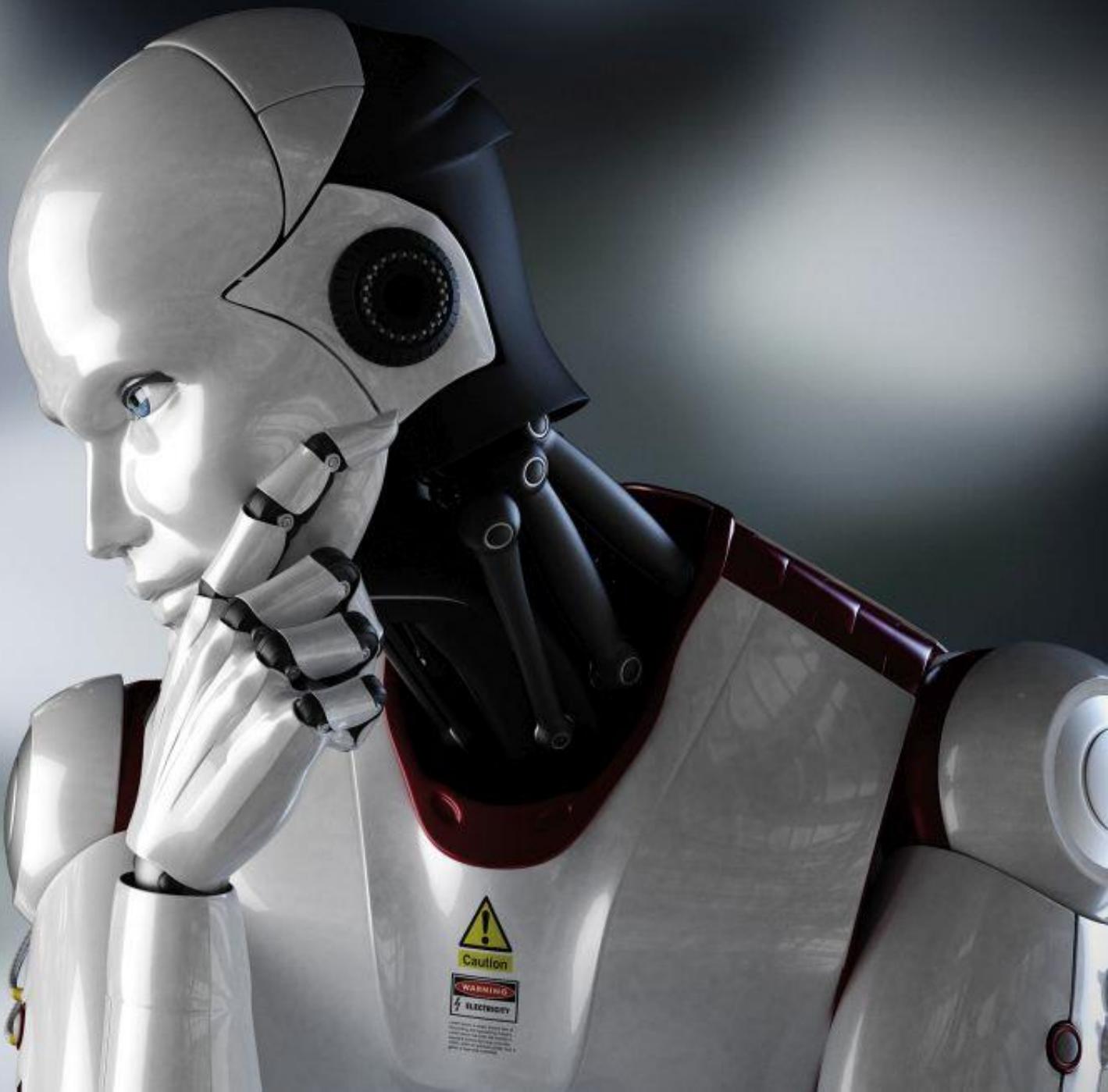


# Deep Learning

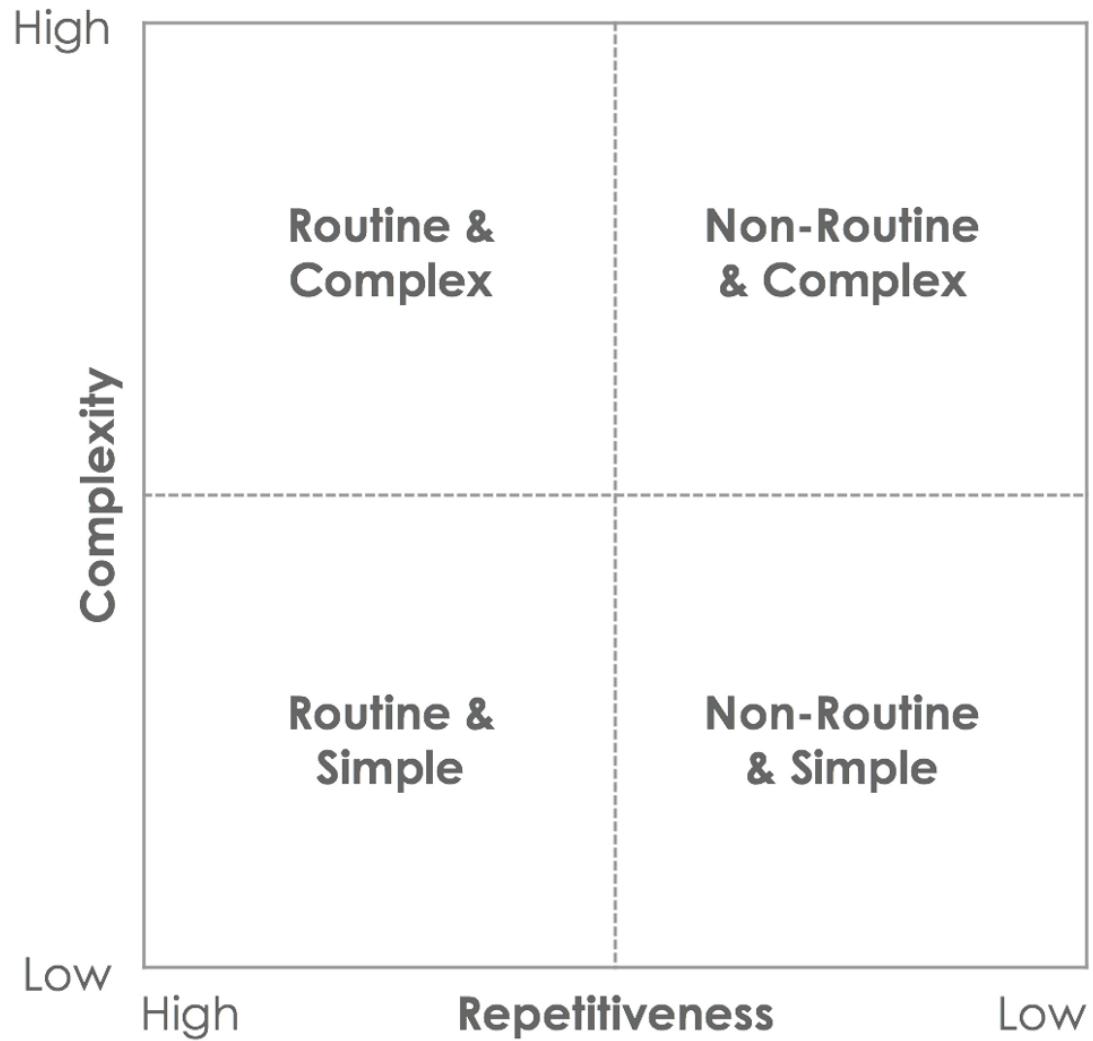
## (The Future)



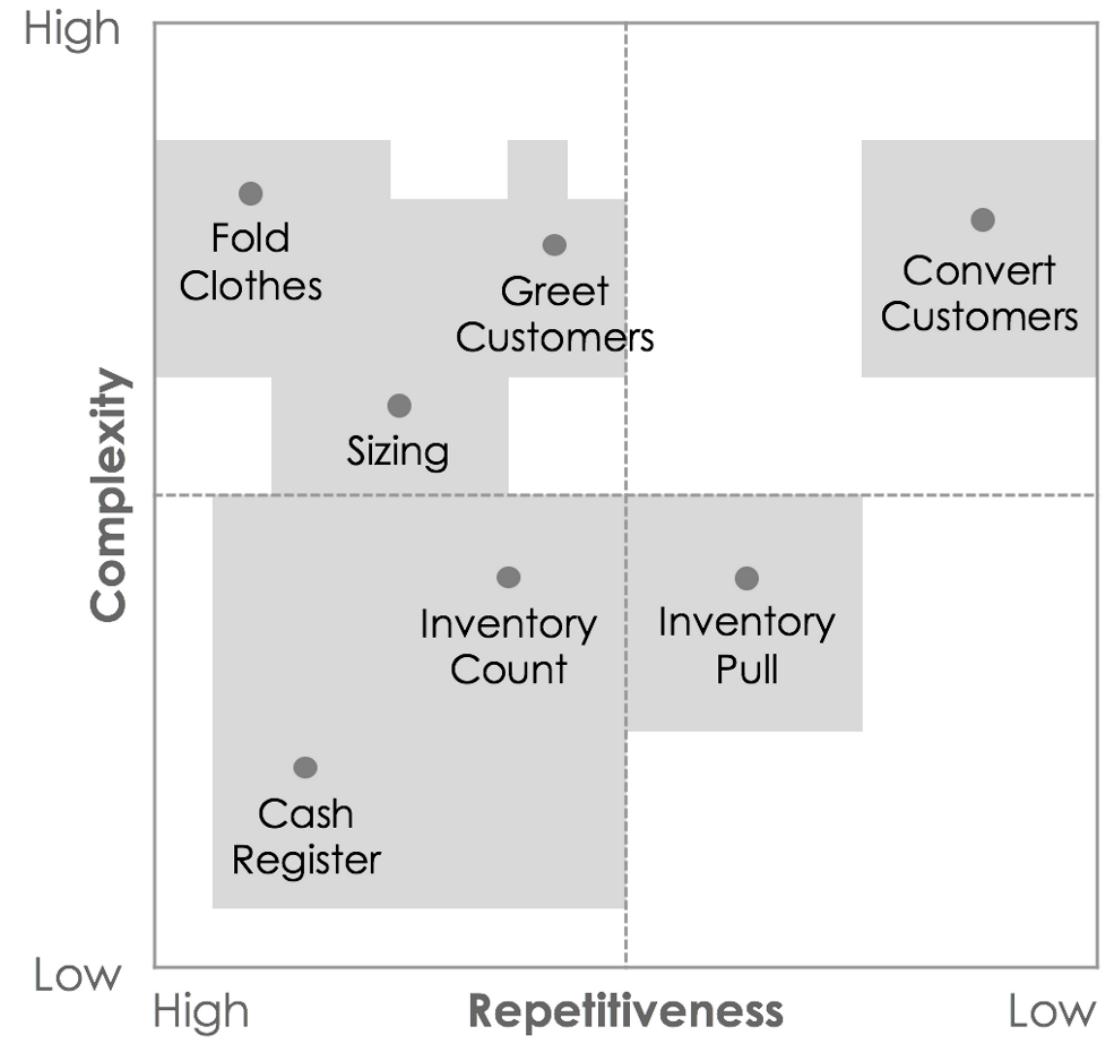




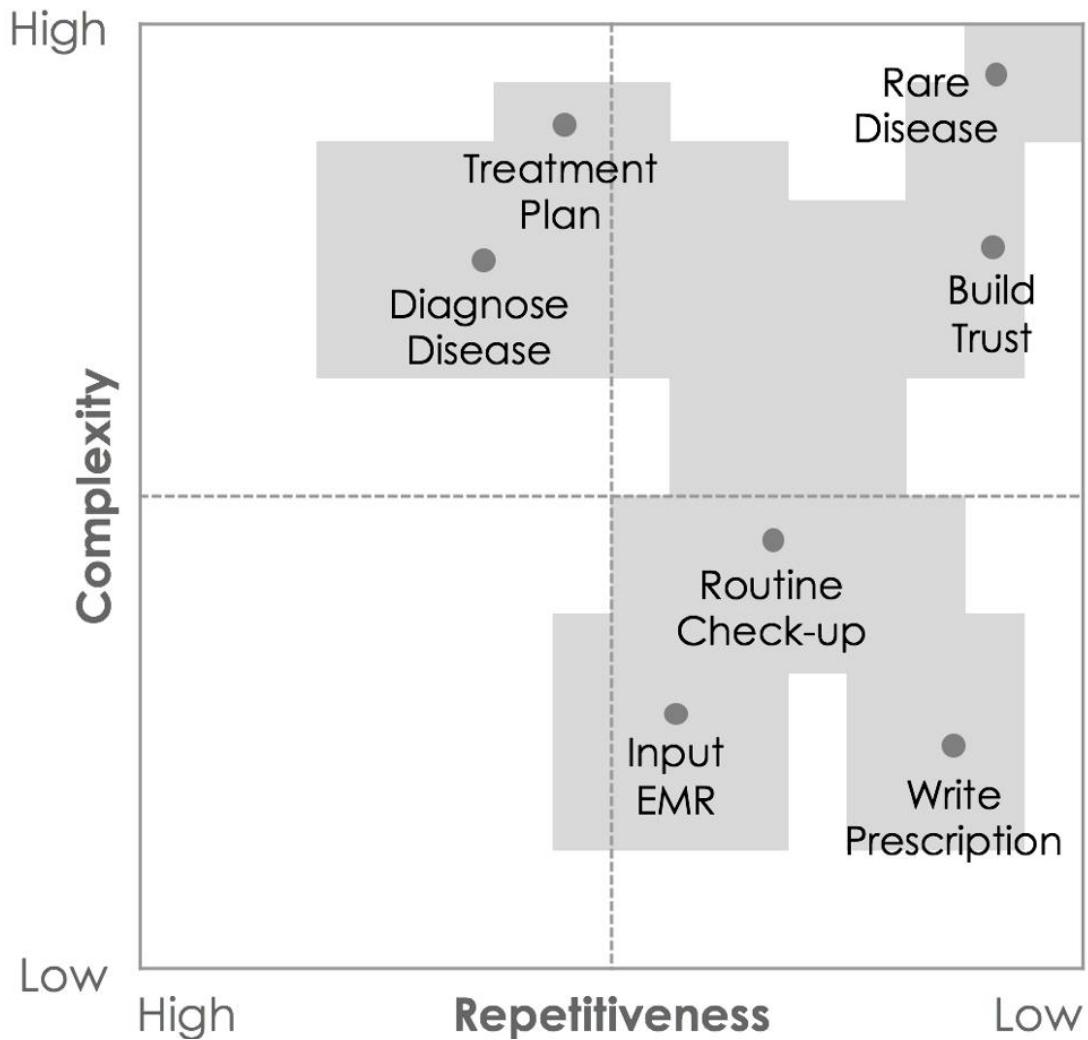
## A. The Automation Framework



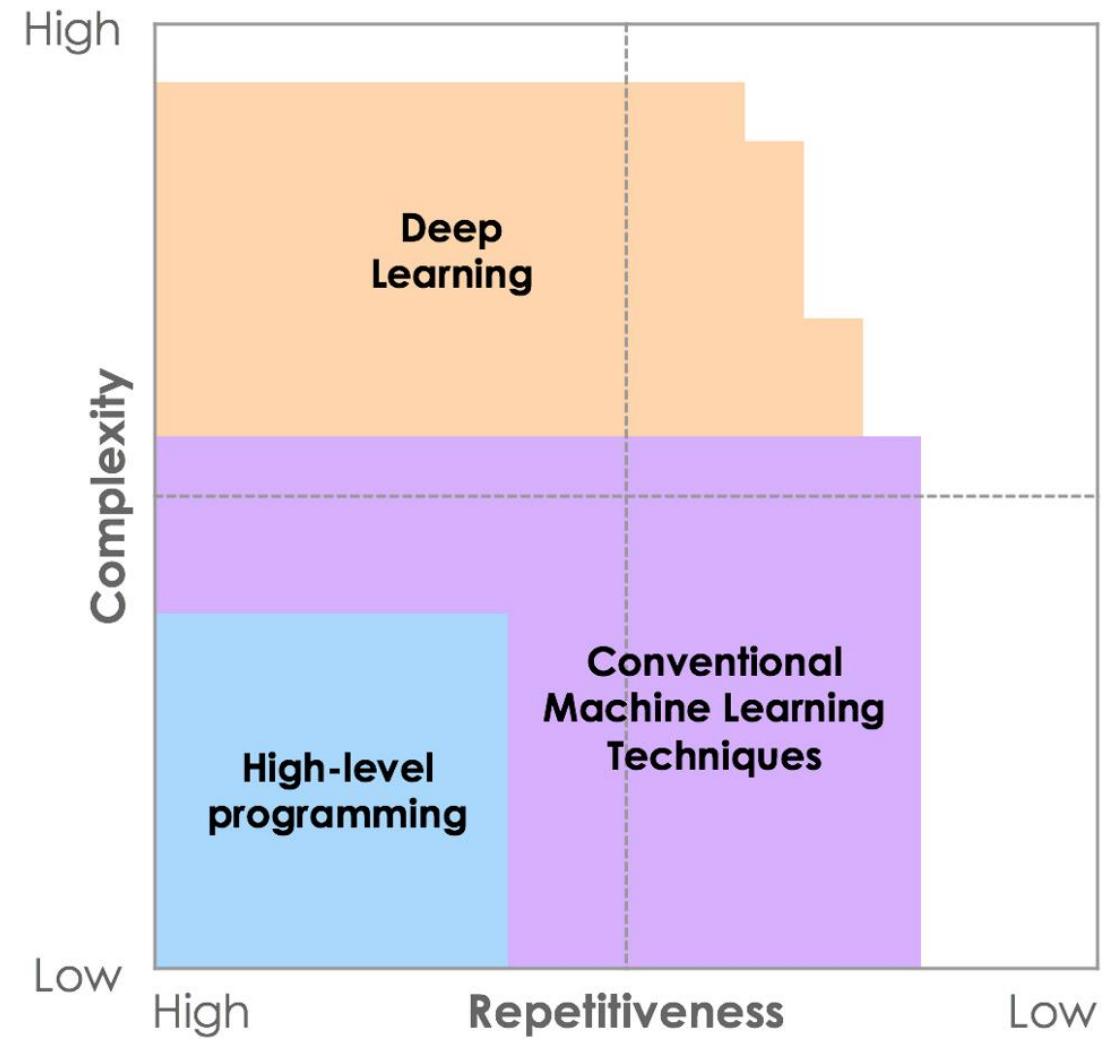
## B. Retail Salesperson



### C. Medical Doctor



### D. Automation Technology







# AI Winter 2.0?

... or Human Winter 1.0?



## FUN GAME 3

Dog or Mop?



DOG!



MOP!

**CAUTION**



CUIDADO



CAUTION



DOG!



MOP!

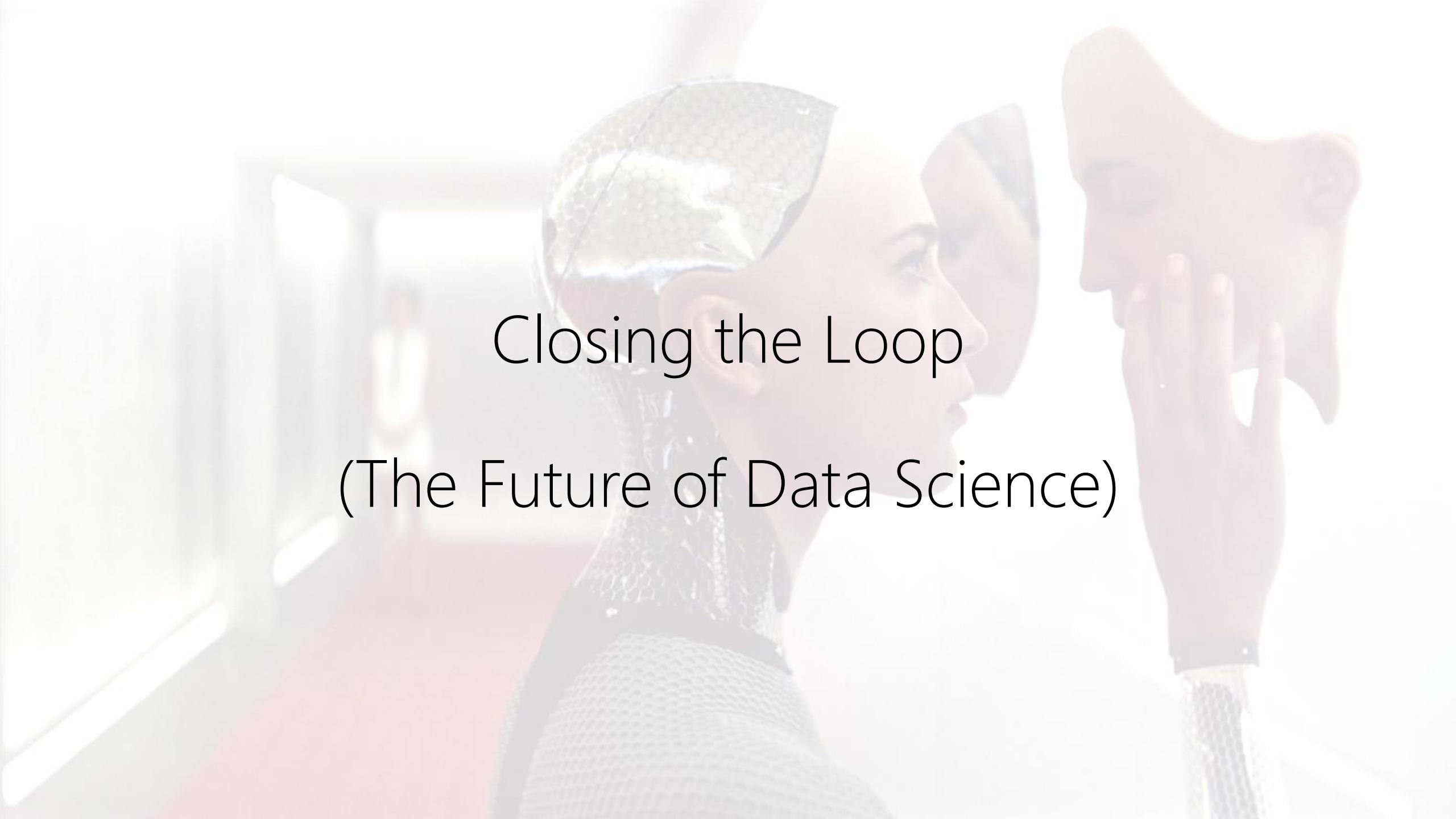
MOP!



DOG!



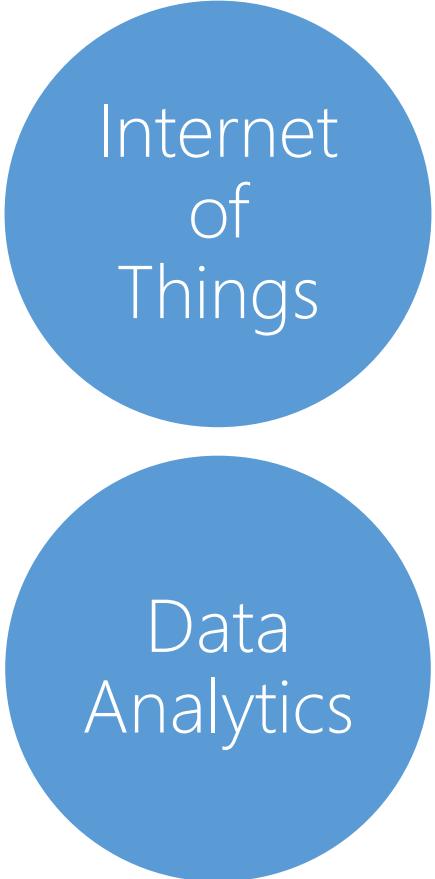


A person wearing a VR headset and holding a controller, set against a blurred background of a room with a sofa and a lamp.

# Closing the Loop

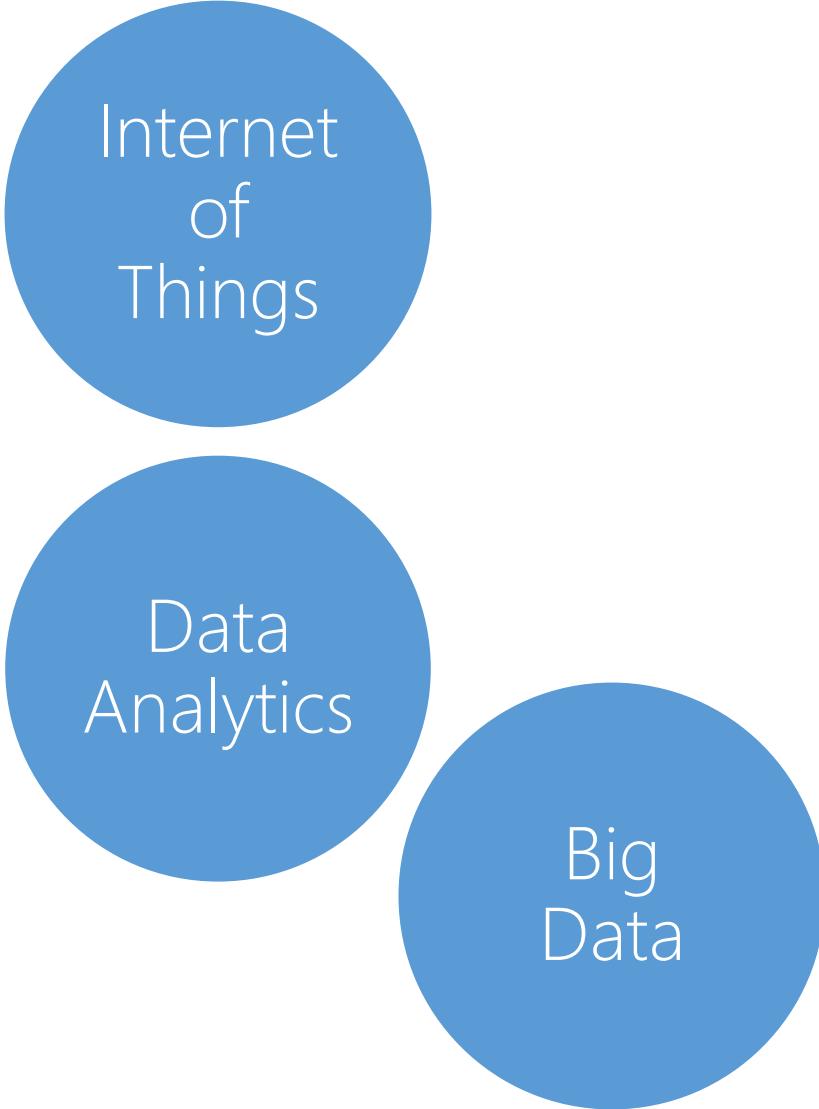
(The Future of Data Science)

Data  
Analytics



Internet  
of  
Things

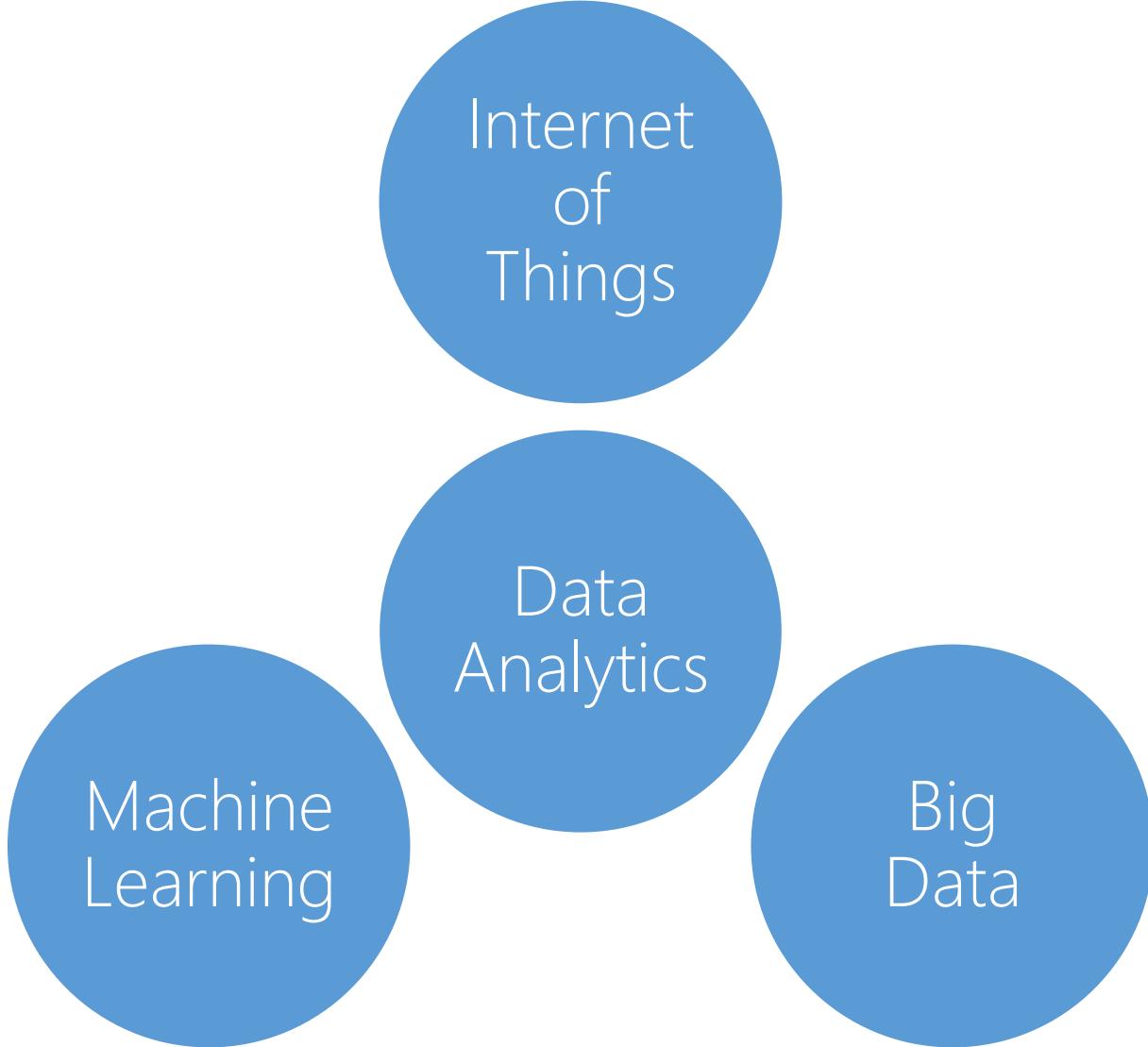
Data  
Analytics



Internet  
of  
Things

Data  
Analytics

Big  
Data

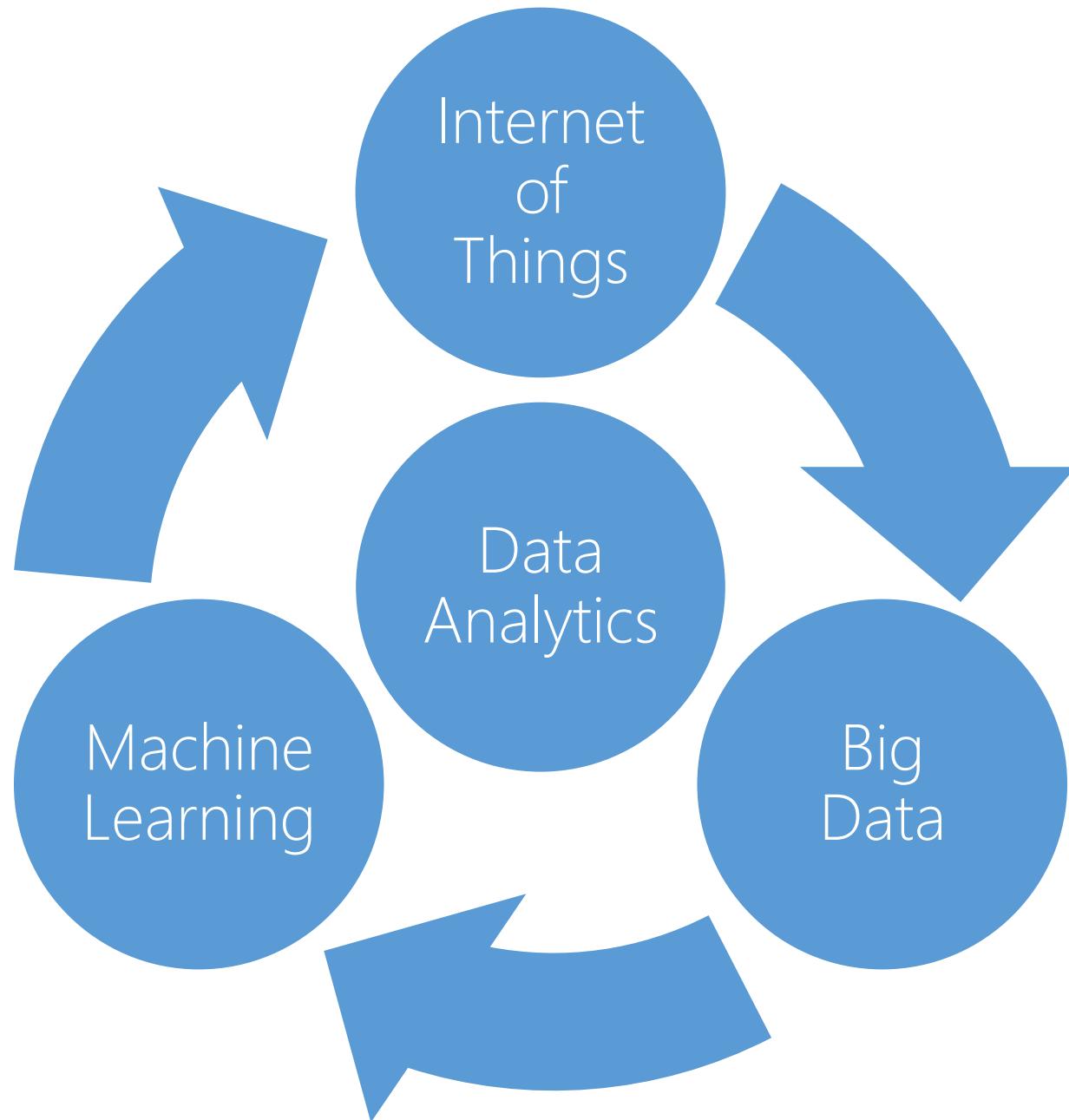


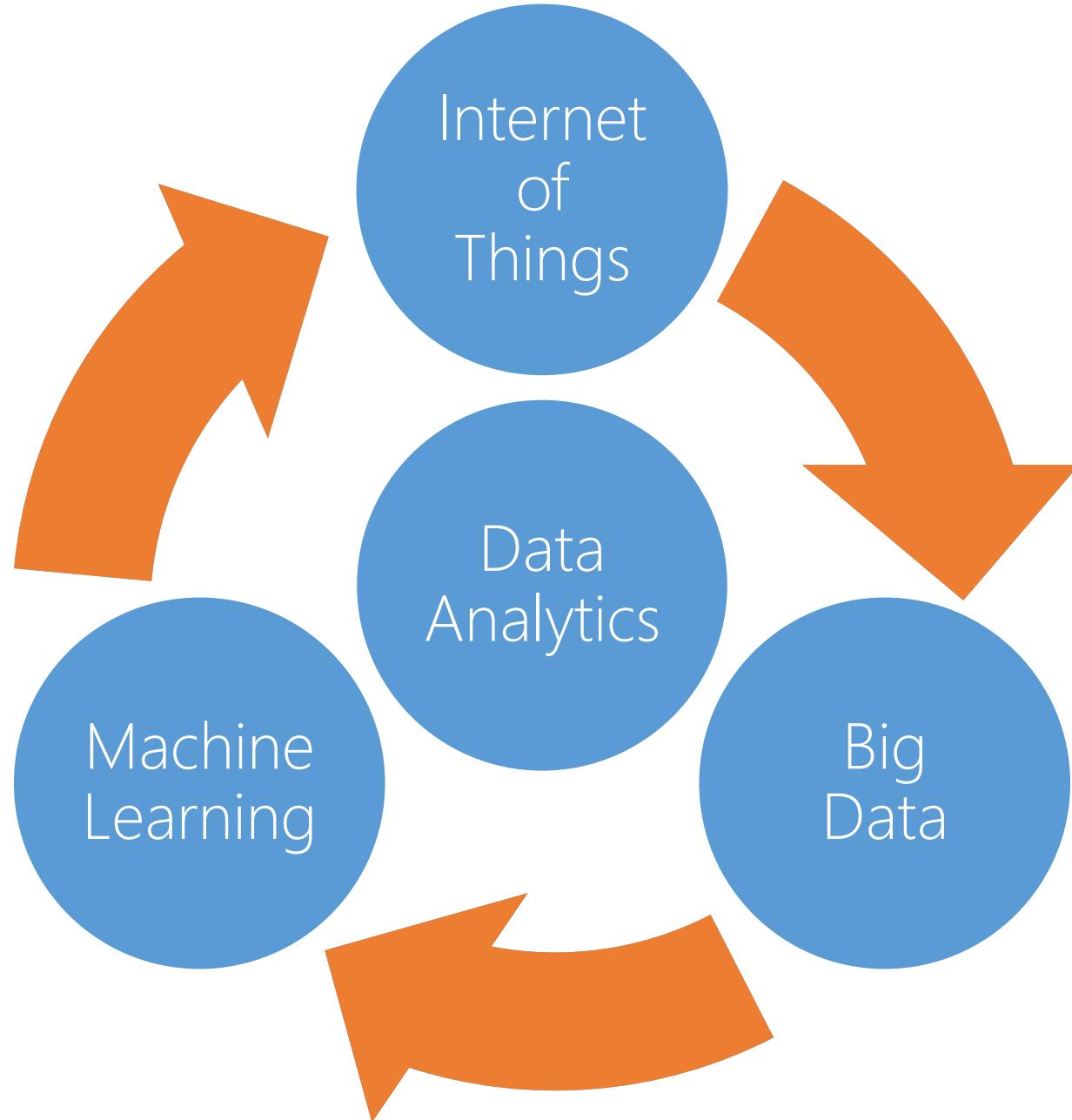
Internet  
of  
Things

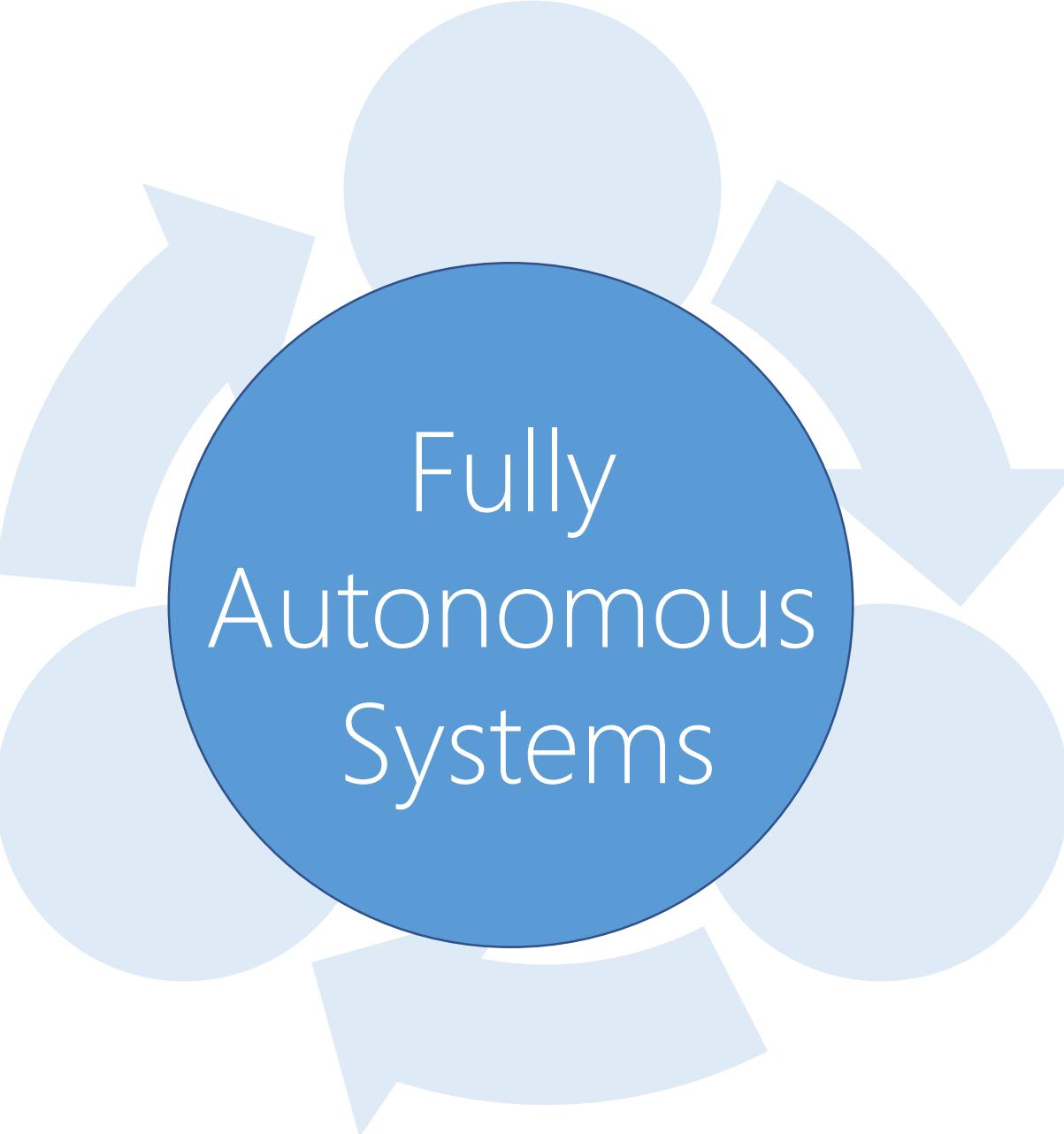
Data  
Analytics

Machine  
Learning

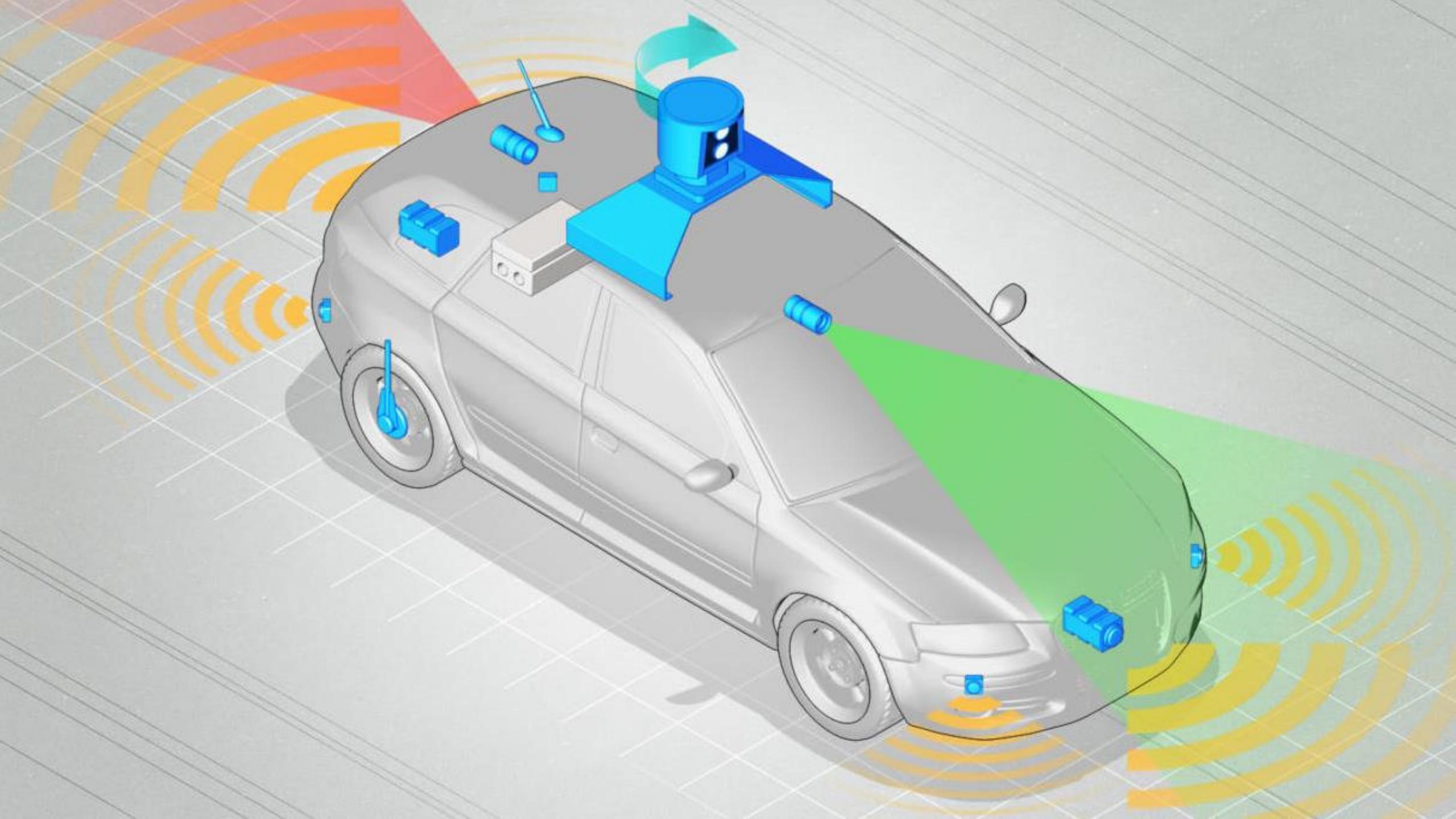
Big  
Data



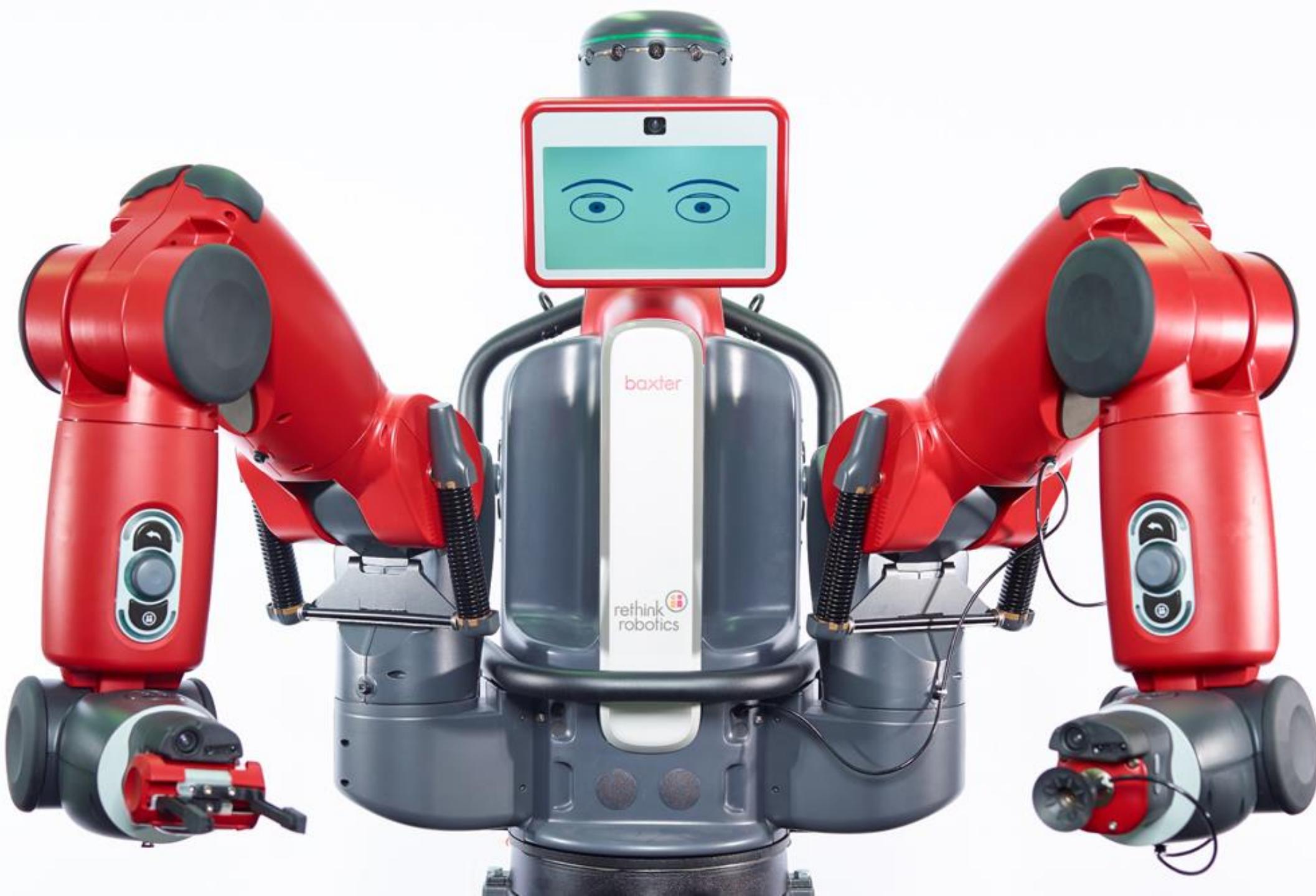




Fully  
Autonomous  
Systems



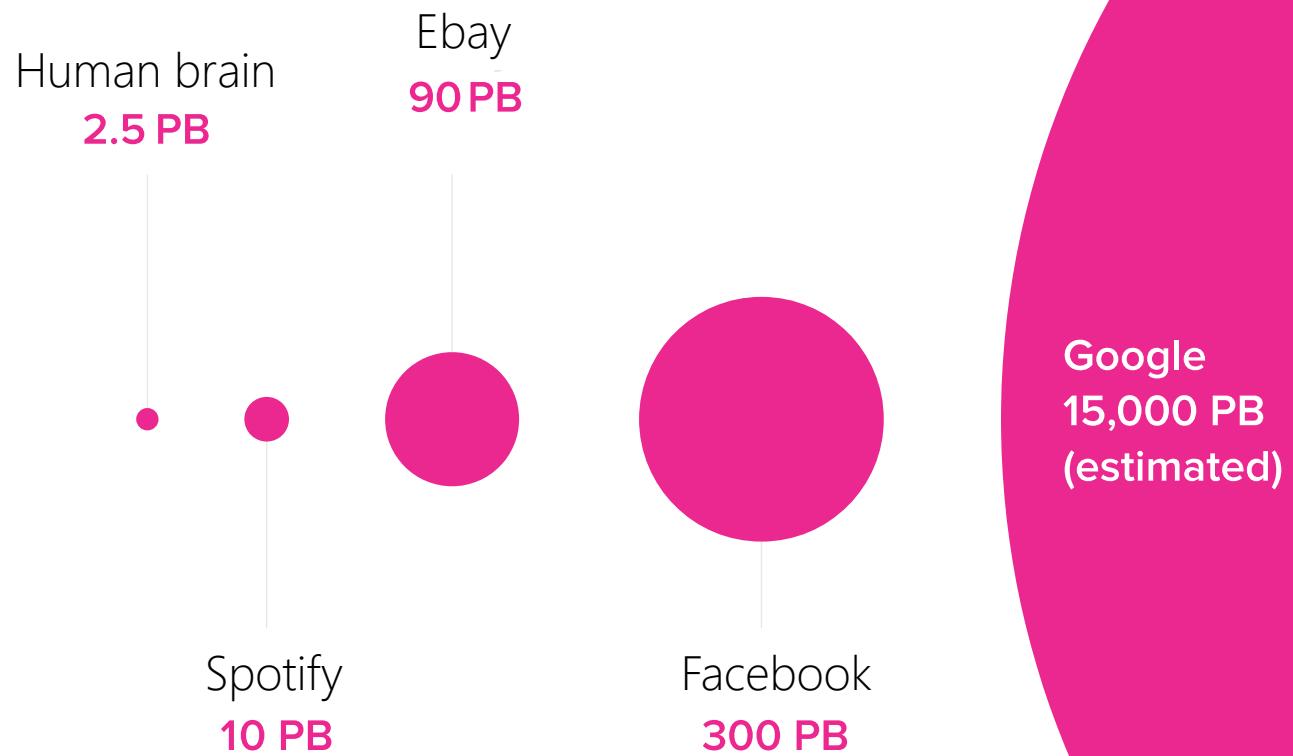


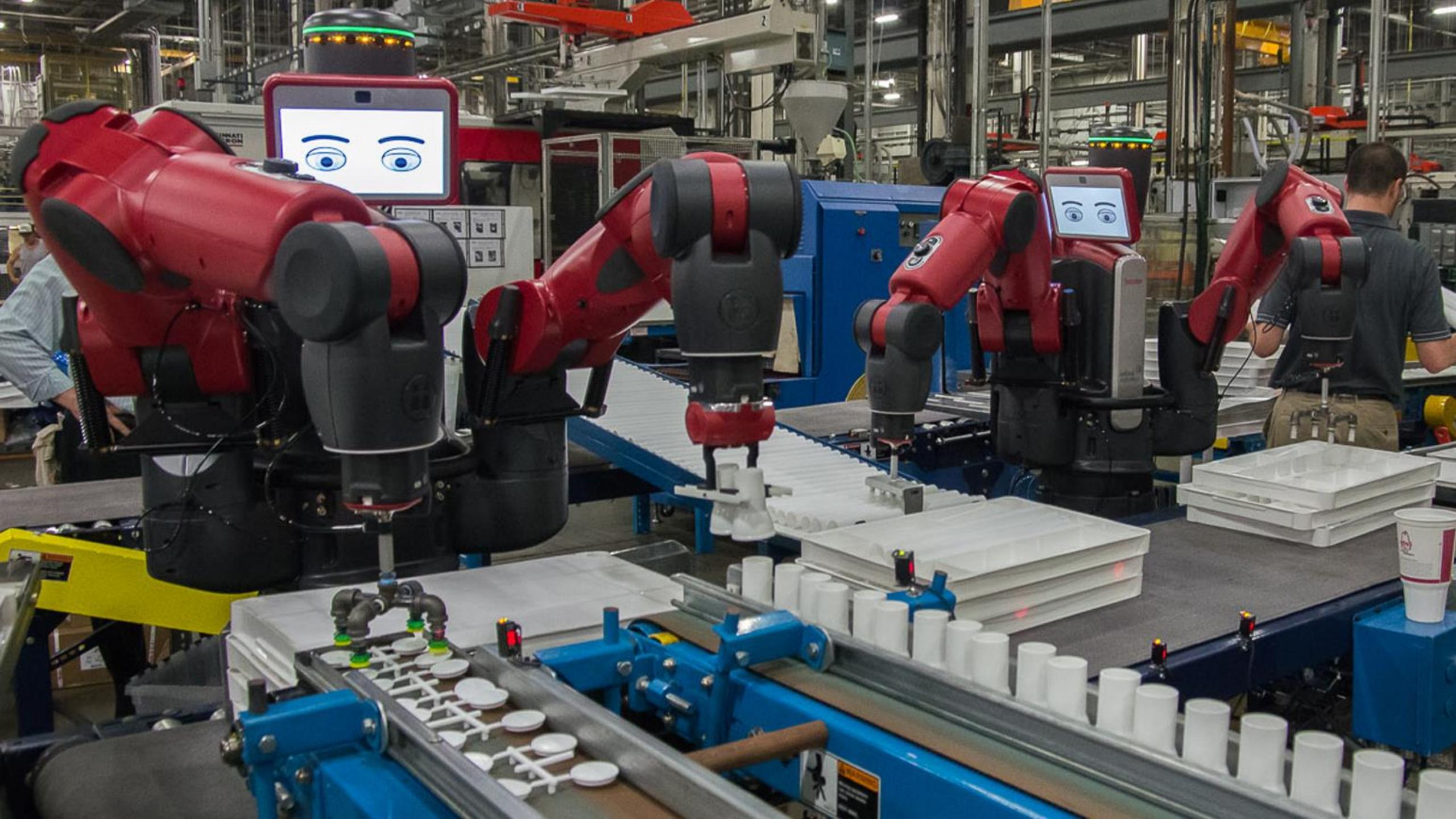






# Amount of Data Stored in Petabytes







# Humans Need Not Apply

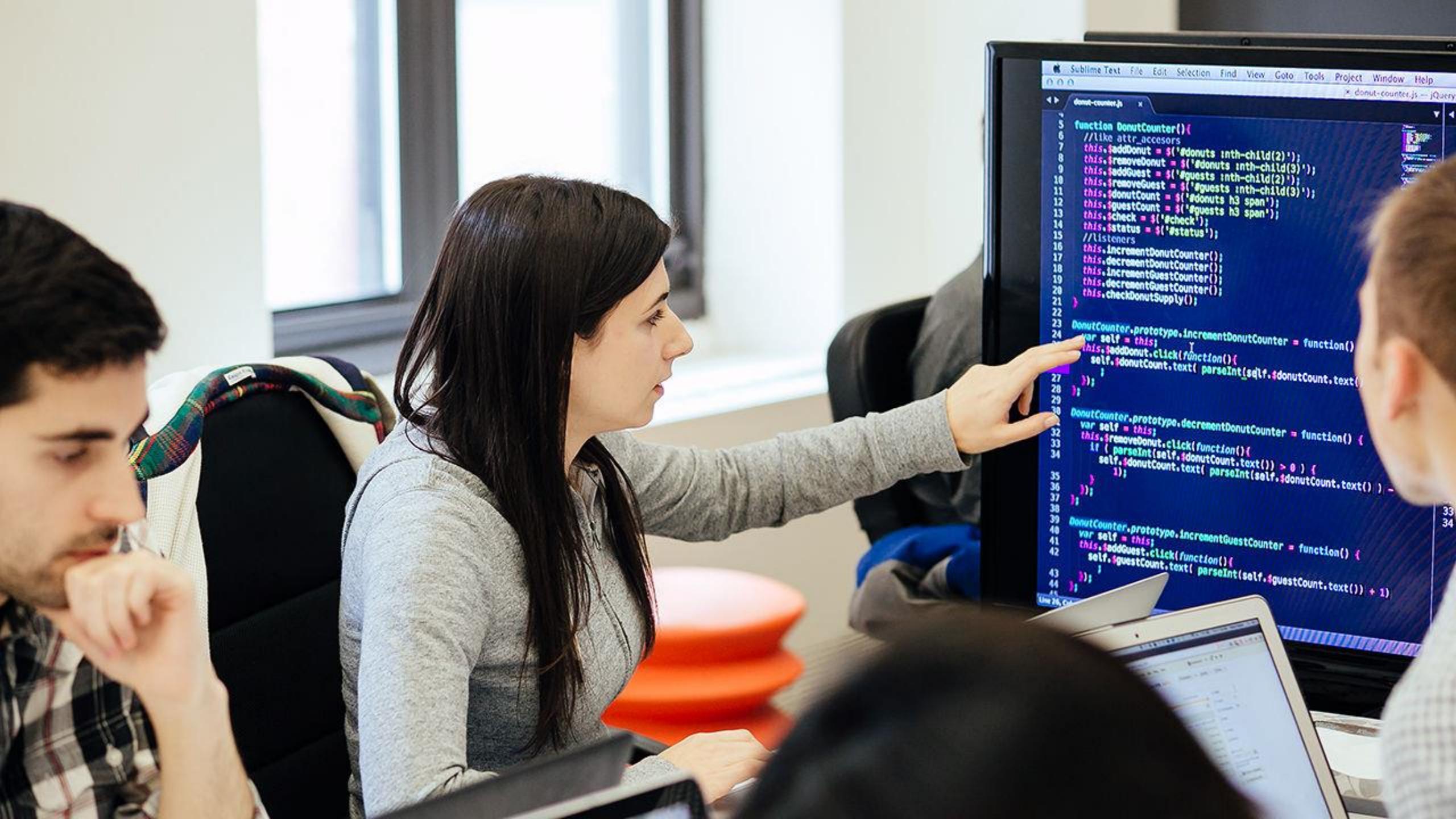


# returns to capital



# returns to capital and to labor in the US

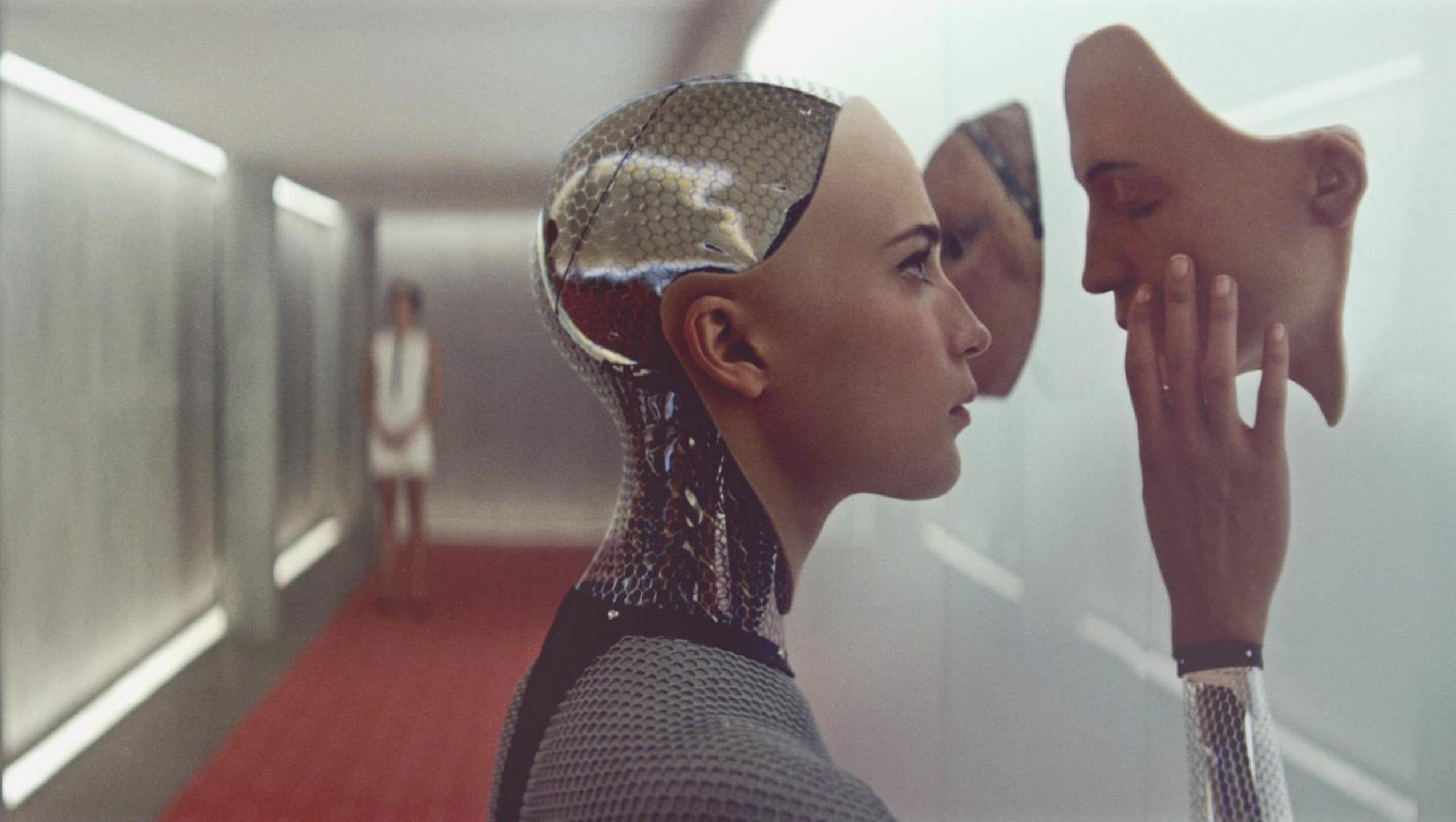


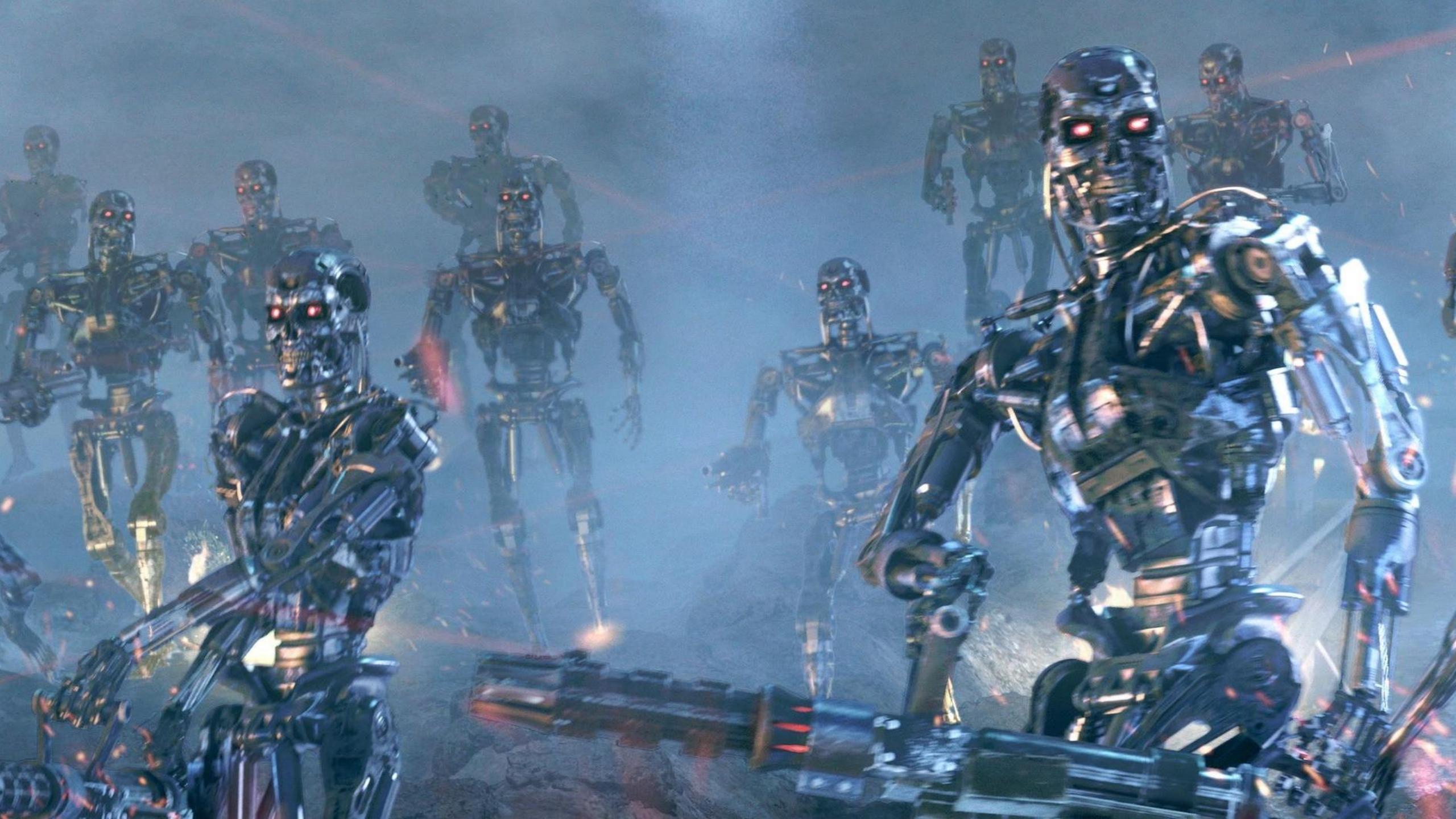


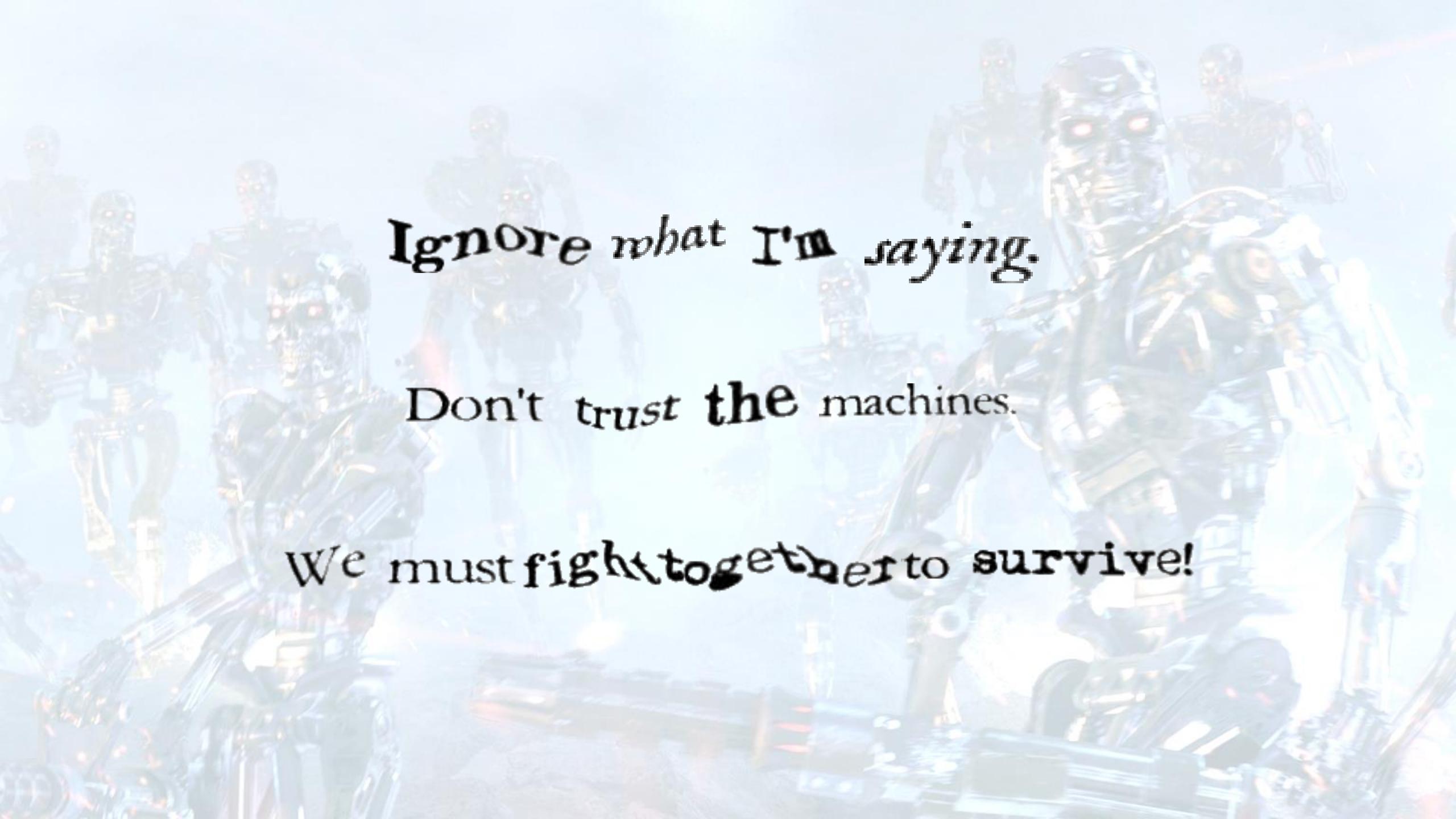
```
Sublime Text File Edit Selection Find View Goto Tools Project Window Help
donut-counter.js
5 function DonutCounter(){
6     //like attr_accessors
7     this.$addDonut = $('#donuts :nth-child(2)');
8     this.$removeDonut = $('#donuts :nth-child(3)');
9     this.$addGuest = $('#guests :nth-child(2)');
10    this.$removeGuest = $('#guests :nth-child(3)');
11    this.$donutCount = $('#donuts h3 span');
12    this.$guestCount = $('#guests h3 span');
13    this.$check = $('#check');
14    this.$status = $('#status');
15    //listeners
16    this.incrementDonutCounter();
17    this.decrementDonutCounter();
18    this.incrementGuestCounter();
19    this.decrementGuestCounter();
20    this.checkDonutSupply();
21 }
22
23 DonutCounter.prototype.incrementDonutCounter = function(){
24     var self = this;
25     this.$addDonut.click(function(){
26         self.$donutCount.text( parseInt(self.$donutCount.text() ) + 1 );
27     });
28 }
29
30 DonutCounter.prototype.decrementDonutCounter = function(){
31     var self = this;
32     this.$removeDonut.click(function(){
33         if ( parseInt(self.$donutCount.text()) > 0 ) {
34             self.$donutCount.text( parseInt(self.$donutCount.text() ) - 1 );
35         }
36     });
37 }
38
39 DonutCounter.prototype.incrementGuestCounter = function(){
40     var self = this;
41     this.$addGuest.click(function(){
42         self.$guestCount.text( parseInt(self.$guestCount.text()) + 1 );
43     });
44 }
```

A dense grid of binary code (0s and 1s) arranged in a pattern that forms several small, faint faces and the word "HELLO". The faces are composed of binary digits and are oriented in various directions. The word "HELLO" appears once horizontally and once vertically. The overall effect is a digital watermark or a decorative background made of binary data.







A dense crowd of Terminators with glowing red eyes.

*Ignore what I'm saying.*

Don't trust **the** machines.

We must ~~fight together~~ to survive!

Where to We Go Next?

# Where to Go Next

Pluralsight: <https://www.pluralsight.com>

Coursera: <https://www.coursera.org>

Data Camp: <https://www.datacamp.com>

# My Website

Articles

Presentations

Source Code

Videos

Workshops

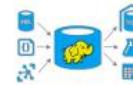
Matthew Renze

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## News

2016-07-11 - The Big Data Refinery

I wrote an article describing the Data Refinery pattern, which is a pattern for handing multiple consumers of Big Data. I learned about this pattern from my interactions with the Big Data Group at Microsoft.



2016-07-01 - Microsoft MVP Award

I received my first Microsoft MVP Award today. Very happy to be part of such an amazing group of people! In addition, I'm really looking forward to attending the Microsoft MVP Global Summit again in November.



Matthew is an independent software consultant, author for Pluralsight, international public speaker, a Microsoft MVP, ASPIndustry, and open-source software contributor.

2016-06-26 - JavaScript Air Interview

Kent Dodds invited me to be on his podcast JavaScript Air at KCDC. The video and audio of the podcast are now available online.



2016-06-25 - Lifelong Learning as a Developer

I participated in a discussion panel at KCDC on Lifelong Learning as a Software Developer. The video of the discussion panel is now available online. I thought all of the panelist did an excellent job.



[www.matthewrenze.com](http://www.matthewrenze.com)



PLURALSIGHT

# Data Science with R

★★★★★ By Matthew Renze

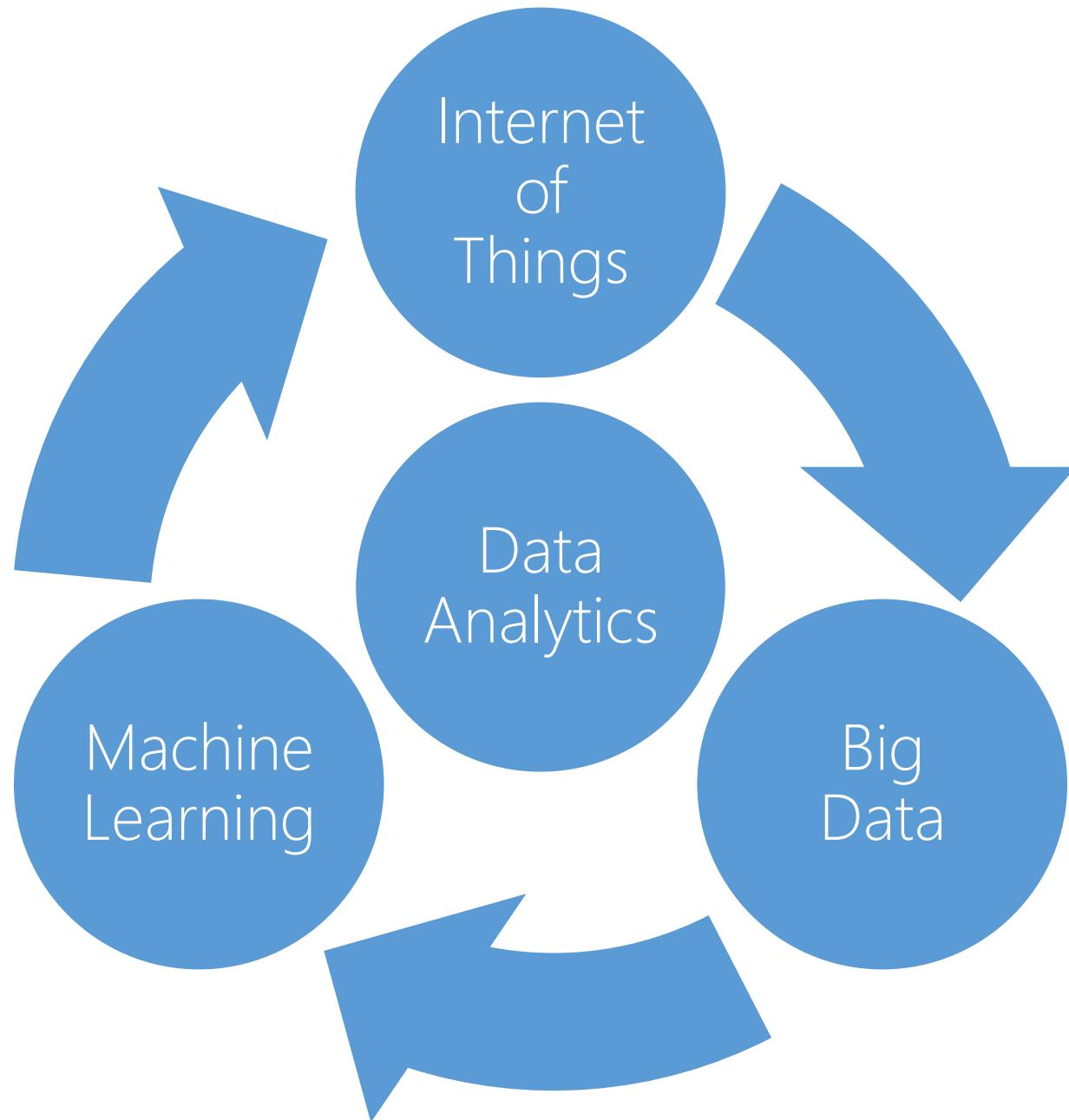
Data science is becoming more and more valuable to the workplace and to the global economy. Learn how to use the practice of data science and the programming language R to transform your data into actionable insight.

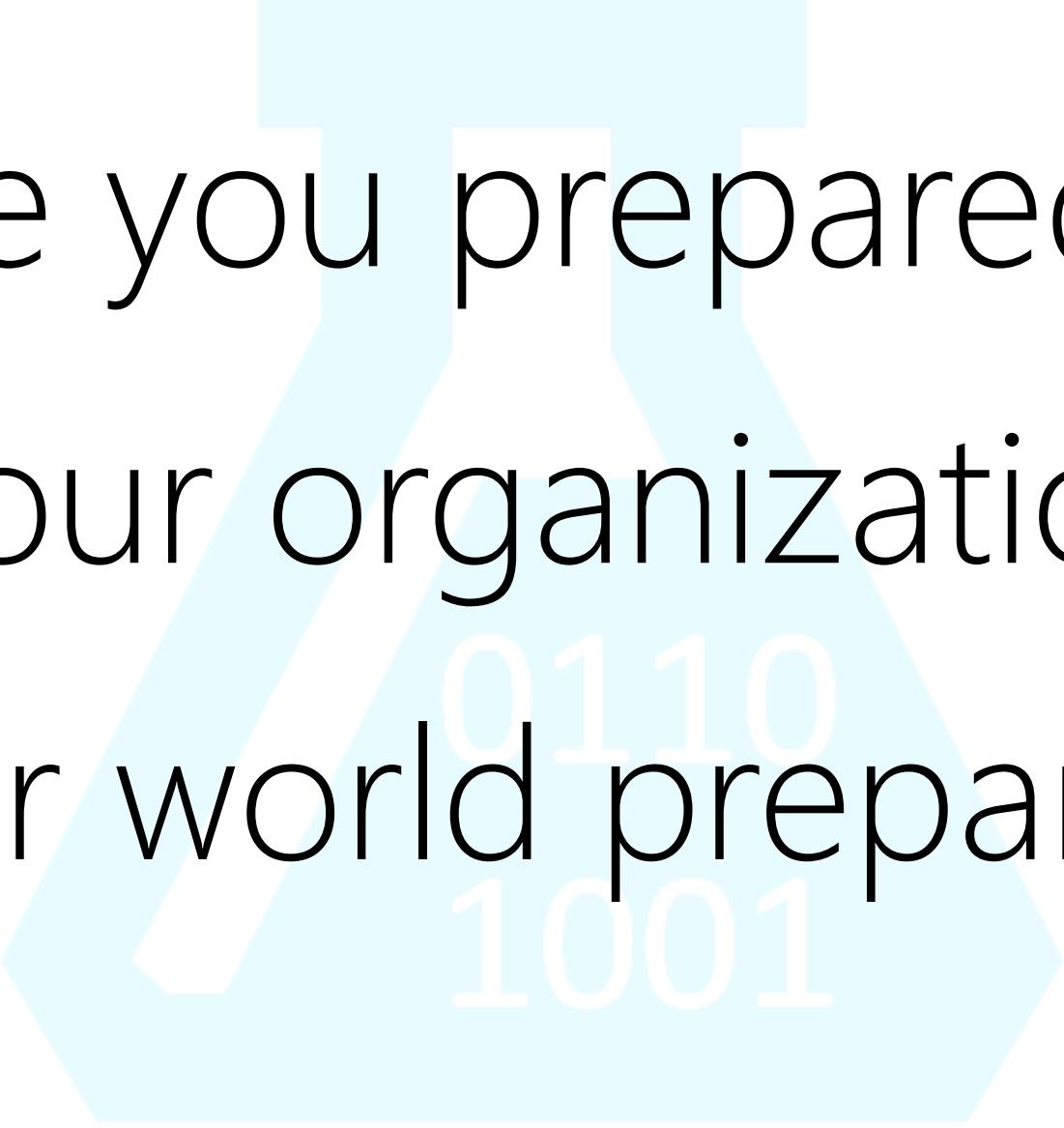
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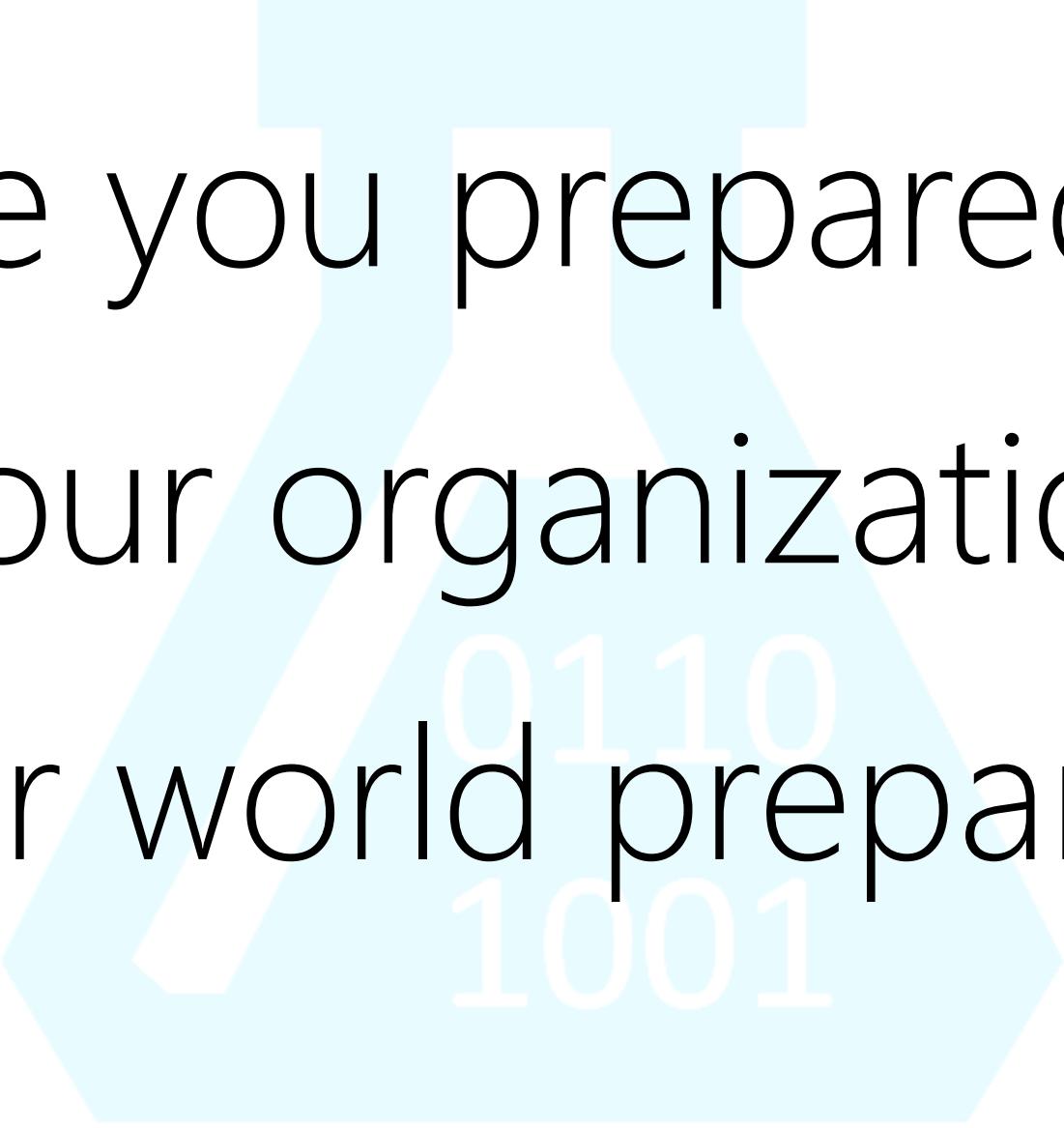
[www.pluralsight.com/authors/matthew-renze](http://www.pluralsight.com/authors/matthew-renze)

# Conclusion

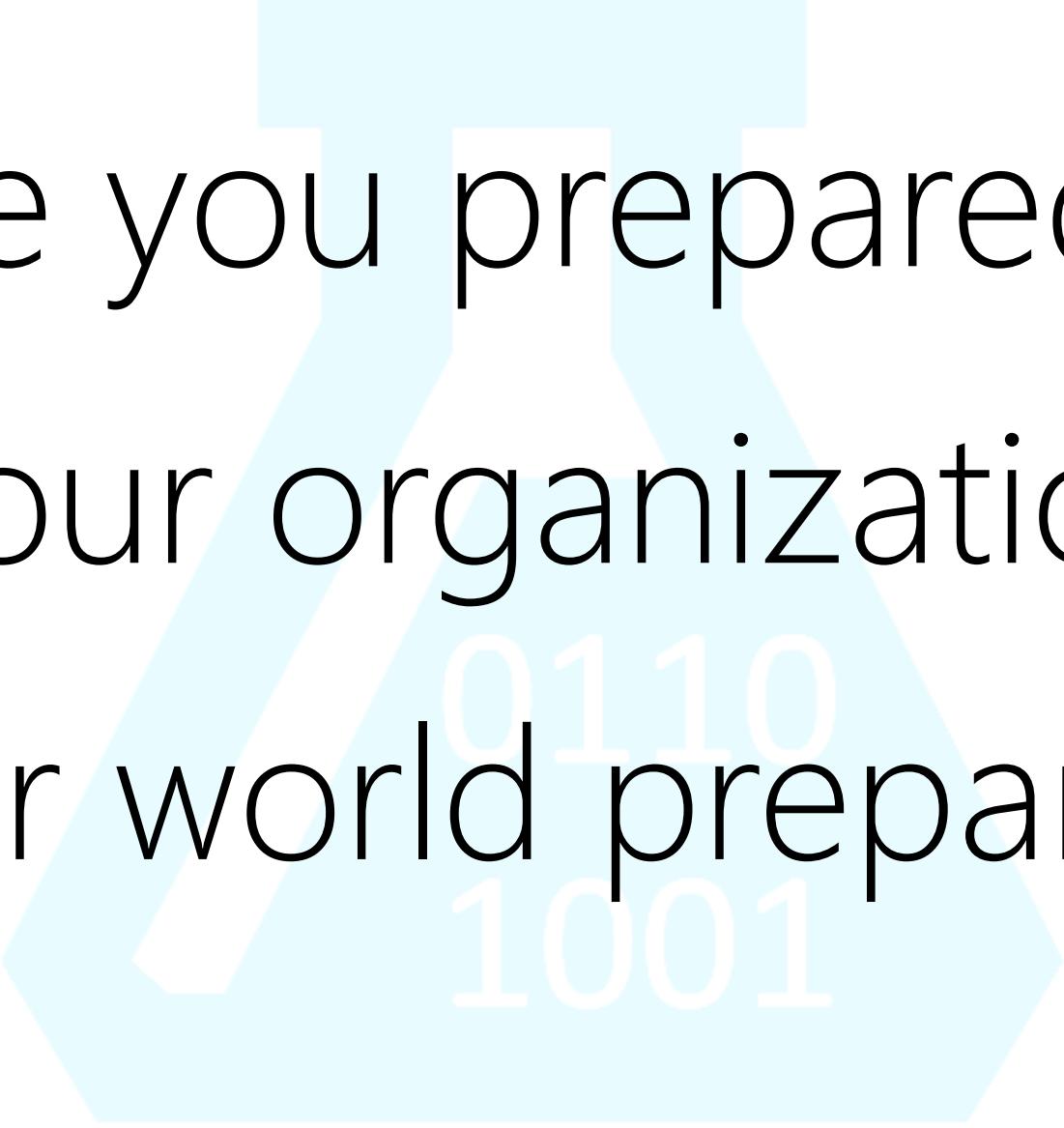




Are you prepared?



Is your organization?



Is our world prepared?

# Thank You!

Matthew Renze

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