Master Degree in

DATASCIENCE

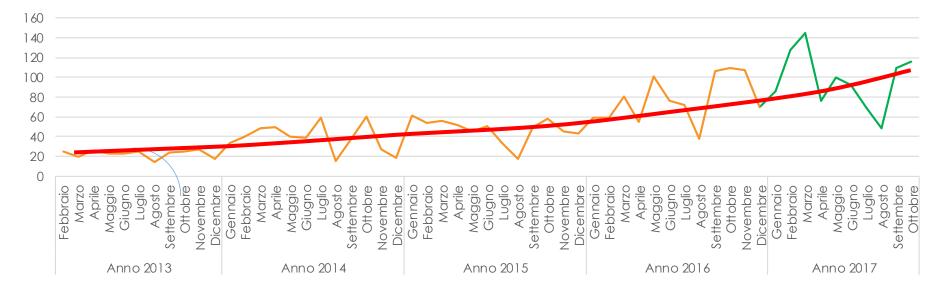# University of Milano-Bicocca

Open Day del 16 Maggio 2018

Carlo Batini
La Data Science @ Bicocca
compie un anno….

1

La nuova professione del Data Scientist

Variazione tendenziale nella domanda di Data Scientist tra 2015 e 2017 → **104%** (Fonte CRISP)

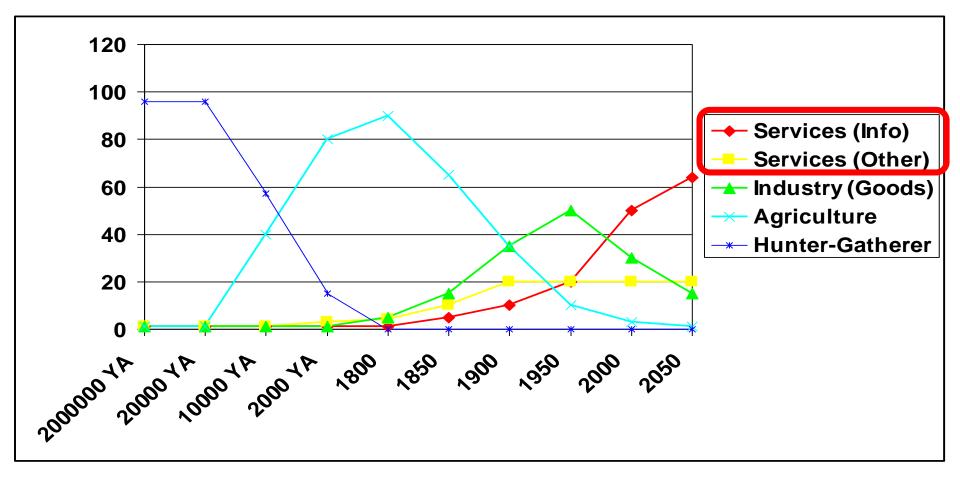968 annunci Gennaio-Ottobre 2017

Ripartizione territoriale della domanda di Data Scientist (fonte Crisp)

1. **Lombardia 48%**
2. **Lazio 17%**
3. **Piemonte 9%**
4. **Emilia Romagna 8%**

Data are dramatically changing jobs

Fonte World Economic Forum

Are these the world's best jobs?

Ranking determined by work-life balance rating

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Rank	Job	Salary
1	Data Scientist	$114,808
2	SEO Manager	$45,720
3	Talent Acquisition Specialist	$63,504
4	Social Media Manager	$40,000
5	Substitute Teacher	$24,380
6	Recruiting Coordinator	$44,700
7	UX Designer	$91,440
8	Digital Marketing Manager	$70,052
9	Marketing Assistant	$32,512
10	Web Developer	$66,040
11	RIsk Analyst	$69,088
12	Civil Engineer	$65,532
13	Client Manager	$71,120
14	Instructional Designer	$66,040
15	Marketing Analyst	$60,000
16	Software QA Engineer	$91,440
17	Web Designer	$53,848
18	Research Technician	$36,525
19	Program Analyst	$71,120
20	Data Analyst	$58,928
21	Content Manager	$60,960
22	Solutions Engineer	$92,456
23	Lab Assistant	$27,550
24	Software Developer	$80,000
25	Front End Developer	$75,000

Source: Glassdoor.com

50 Best Jobs in America - Ranks jobs according to the **Glassdoor Job Score**, which combines: a. number of job openings, b. salary, and c. overall job satisfaction rating

1 Data Scientist

4.8 / 5
Job Score

4.2 / 5
Job Satisfaction

$110,000
Median Base Salary

4,524
Job Openings

View Jobs

2 DevOps Engineer

4.6 / 5
Job Score

4.0 / 5
Job Satisfaction
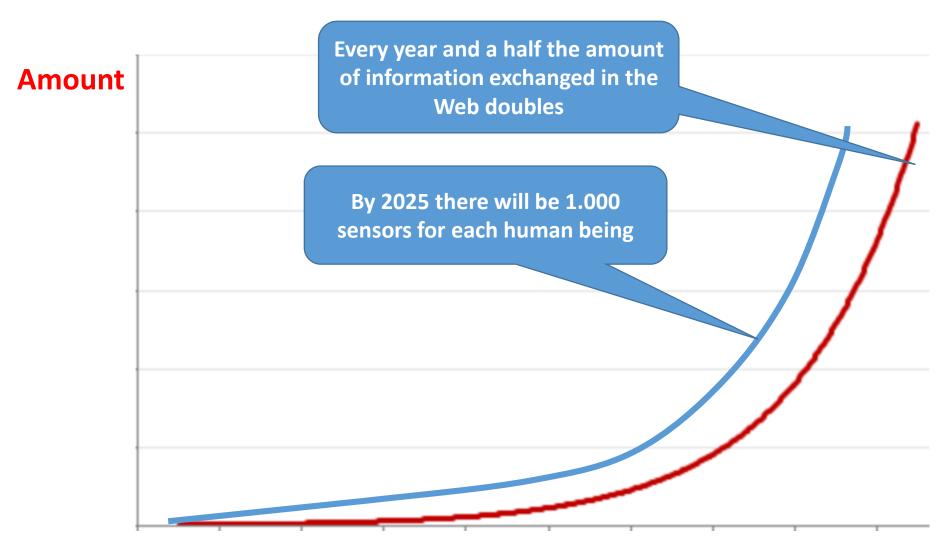
$105,000
Median Base Salary

3,369
Job Openings
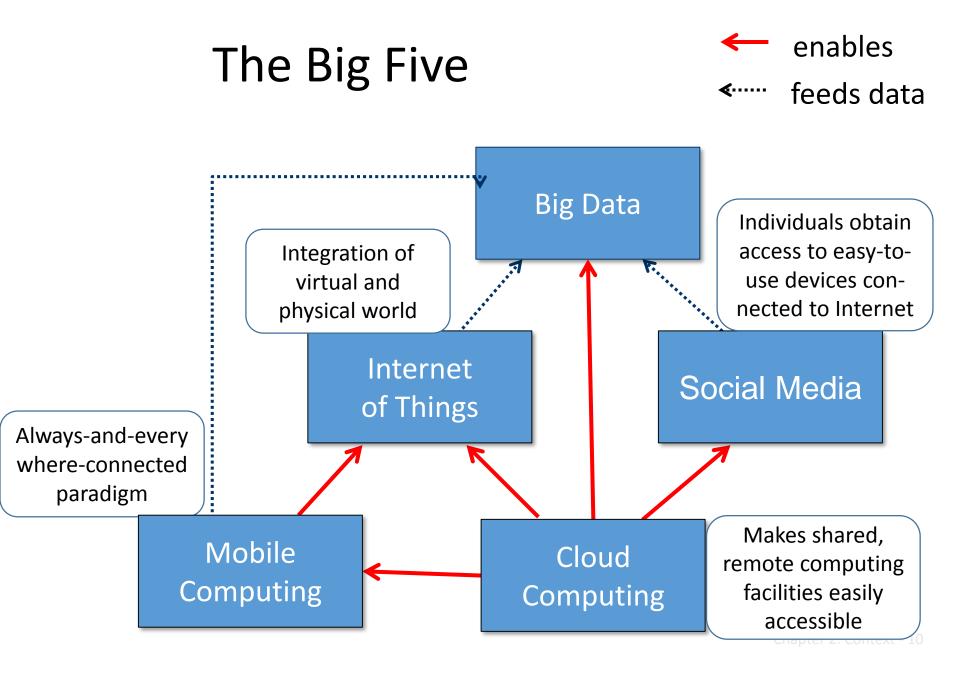
View Jobs

The explosion of big data

Amount

Every year and a half the amount of information exchanged in the Web doubles

By 2025 there will be 1.000 sensors for each human being

Time
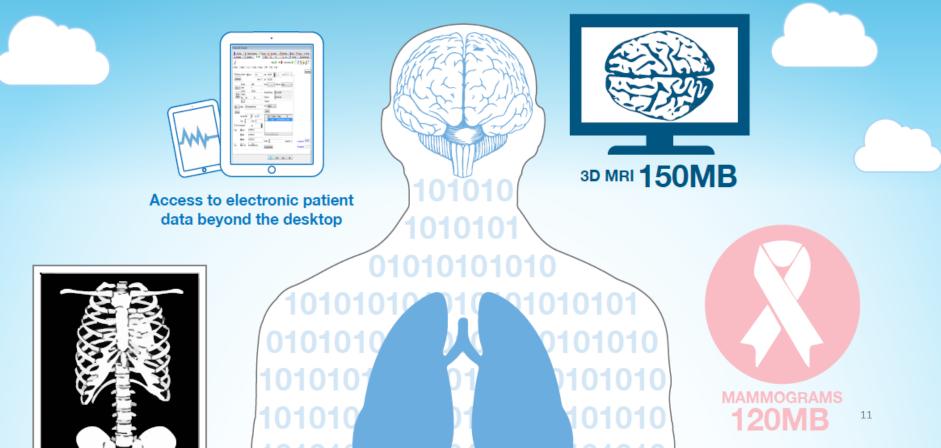
Four Domains of Big Data in 2025 - EB = 10^{18} byte

Data Phase	Astronomy	Twitter	YouTube	Genomics
Acquisition	25 zetta-bytes/year	0.5–15 billion tweets/year	500–900 million hours/year	1 zetta-bases/year
Storage	1 EB/year	1–17 PB/year	1–2 EB/year	2–40 EB/year
Analysis	In situ data reduction	Topic and sentiment mining	Limited requirements	Heterogeneous data and analysis
	Real-time processing	Metadata analysis		Variant calling, ~2 trillion central processing unit (CPU) hours
	Massive volumes			All-pairs genome alignments, ~10,000 trillion CPU hours
Distribution	Dedicated lines from antennae to server (600 TB/s)	Small units of distribution	Major component of modern user's bandwidth (10 MB/s)	Many small (10 MB/s) and fewer massive (10 TB/s) data movement

The Big Five

enables

feeds data

Big Data

Integration of virtual and physical world

Internet of Things

Individuals obtain access to easy-to-use devices con-nected to Internet

Social Media

Always-and-every where-connected paradigm

Mobile Computing

Cloud Computing

Makes shared, remote computing facilities easily accessible
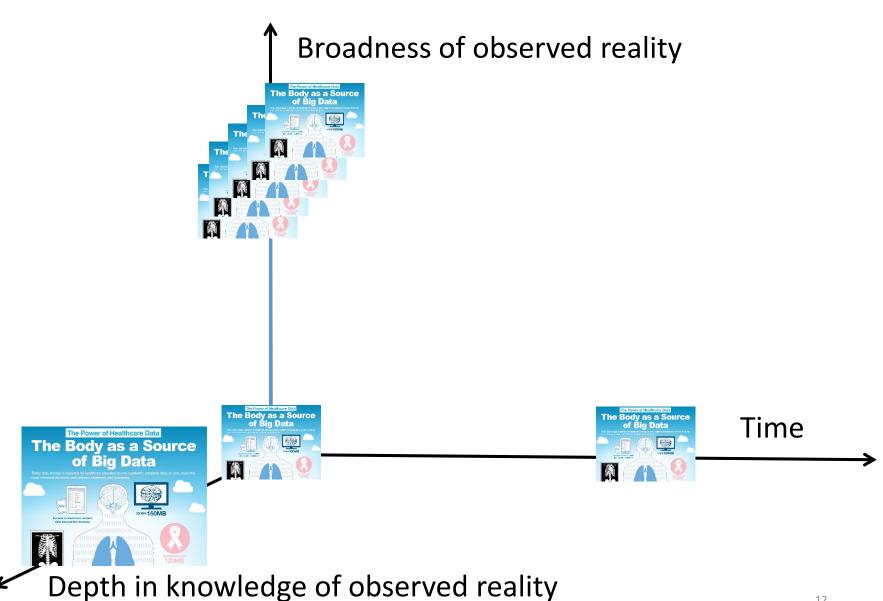
The Body as a Source of Big Data
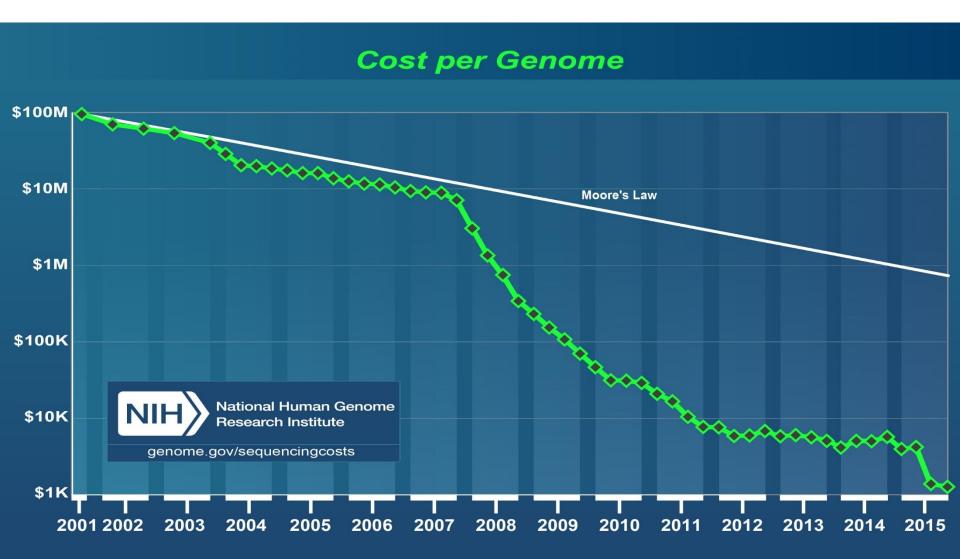
Today data storage is essential for healthcare providers to see a patient's complete story of care, make the most informed decisions and enhance treatment and outcomes.

Access to electronic patient data beyond the desktop

3D MRI 150MB

101010
1010101
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MAMMOGRAMS 120MB

Human genome

Broadness of observed reality

Time

Depth in knowledge of observed reality
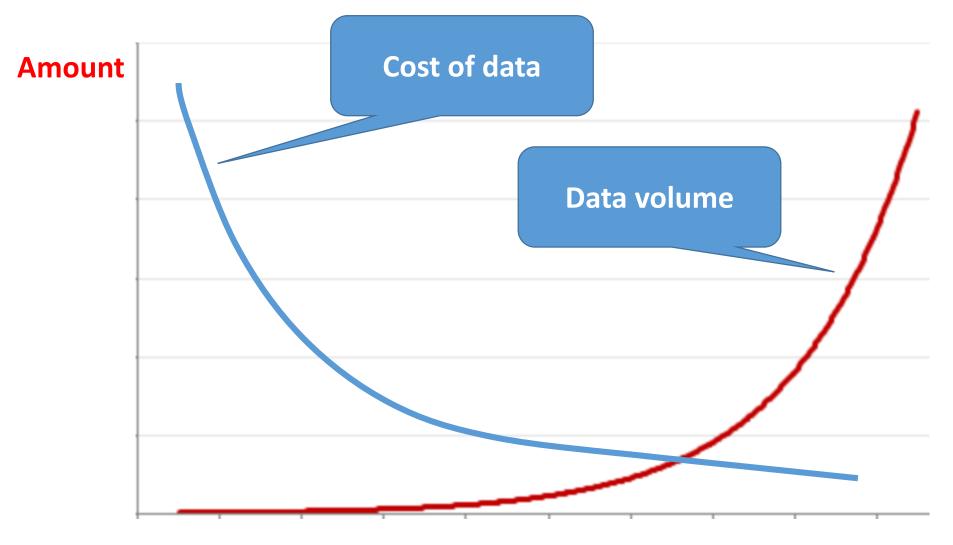
Cost per Genome – From S. Ceri
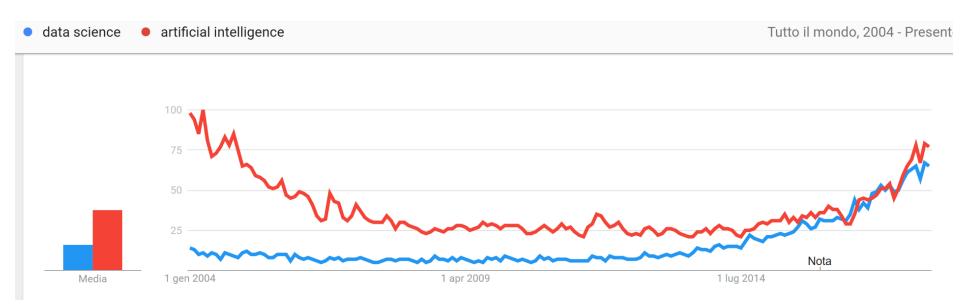
As volume increases, costs decrease
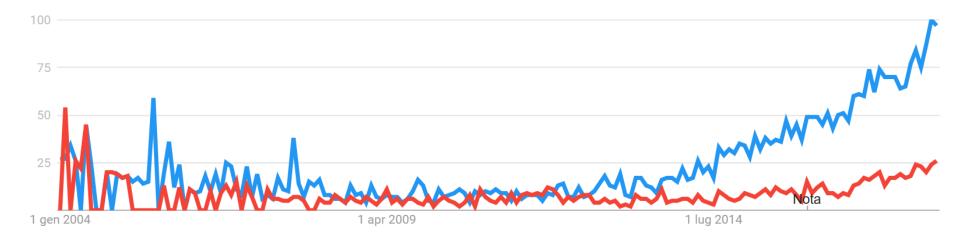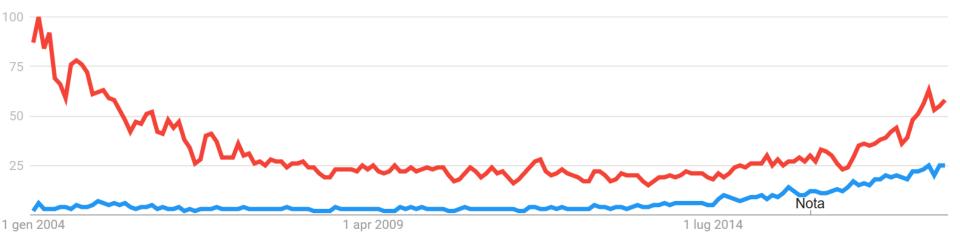
Data Science vs Artificial Intelligence
su Google Trends

Data Science vs **Artificial Intelligence**
Food and beverages

Data Science vs **Artificial Intelligence**
Sciences

What do data scientist do?

- At ease in the digital realm, they are able to **bring structure and meaning** to large quantities of formless data and **make analysis** possible.

- They **identify rich data sources**, **join them** with other, **potentially incomplete** data sources, and **clean** the resulting set.

- **Make discoveries** while swimming in data.

- In a competitive landscape where challenges keep changing, data scientists **help decision makers** to identify better predictive and prescriptive models.
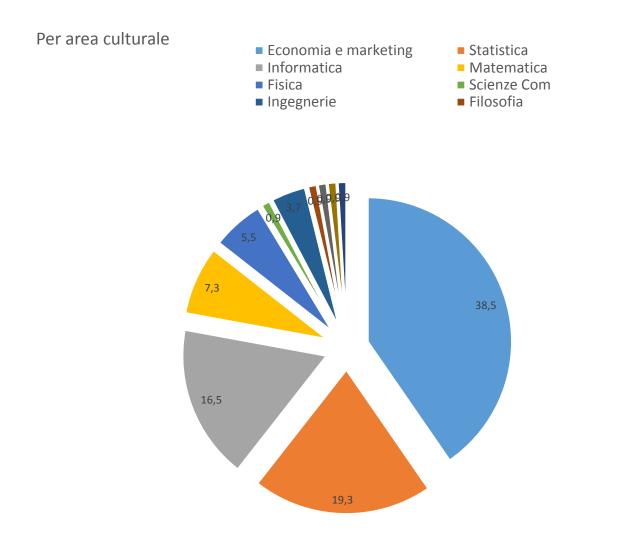
Professional profiles
Technological Data Scientist

- **Applies, adapts and extends statistical techniques** and **computer science technologies** providing effective analyses for decision, operational or research problems.

- **Performs high level architectural design of services** based on digital data.
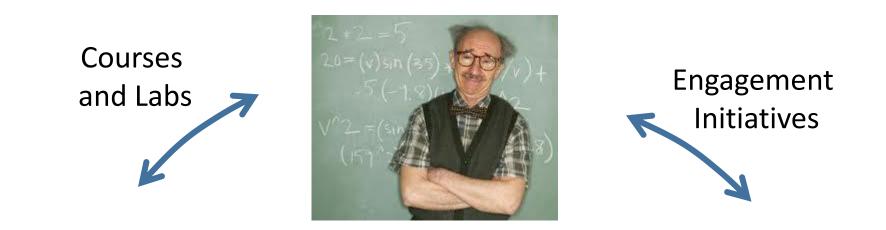
Professional profiles
Business Data Scientist

- **Finds solutions** based on statistical techniques and computer science technologies **to enhance value of decisions** and **value of business processes** in companies and public administrations

- **Conceives new services based on digital data**, which optimize value in use for customers and value in exchange for service providers.

Statistics on enrolled Students - 1

Per area culturale

■ Economia e marketing   ■ Statistica
■ Informatica   ■ Matematica
■ Fisica   ■ Scienze Com
■ Ingegnerie   ■ Filosofia

The three stakeholders, students, companies, teachers: how to boost cooperation among them?

Courses and Labs

Engagement Initiatives
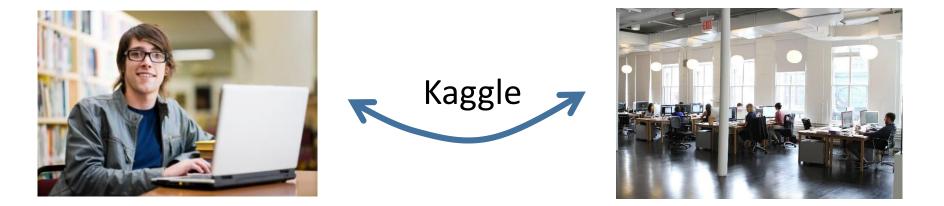
Kaggle

The three stakeholders, students, companies, teachers: how to boost cooperation among them?

Kaggle
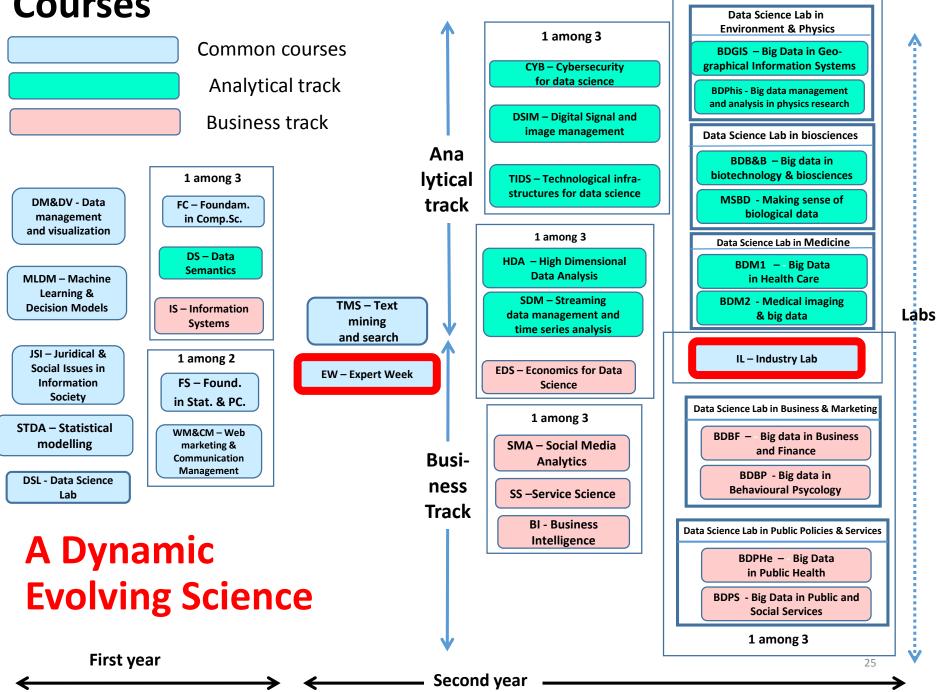
Kaggle: a platform managing data challenges www.kaggle.com
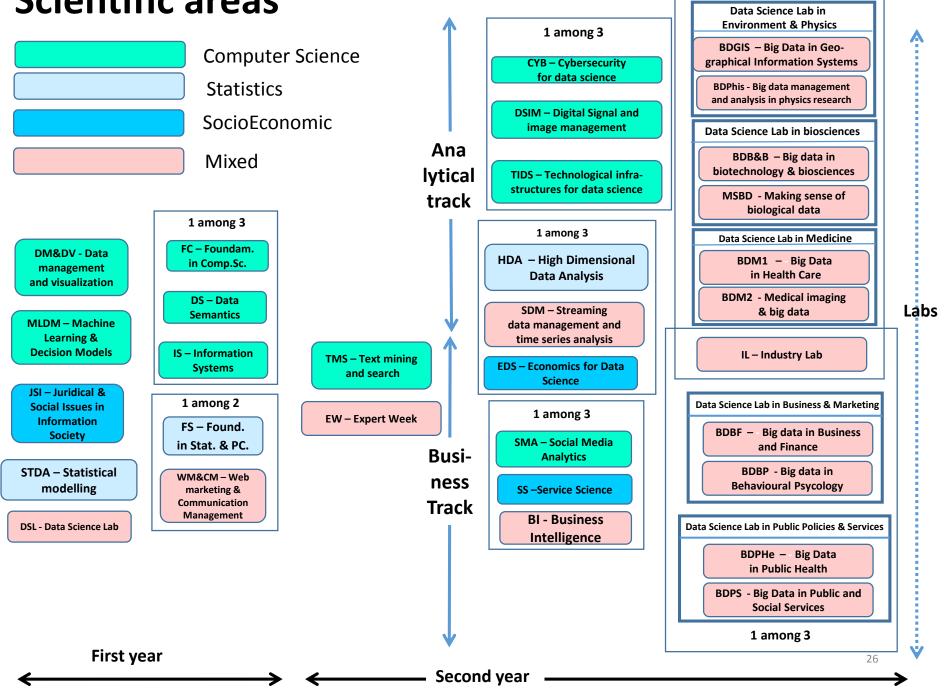
It allows to:
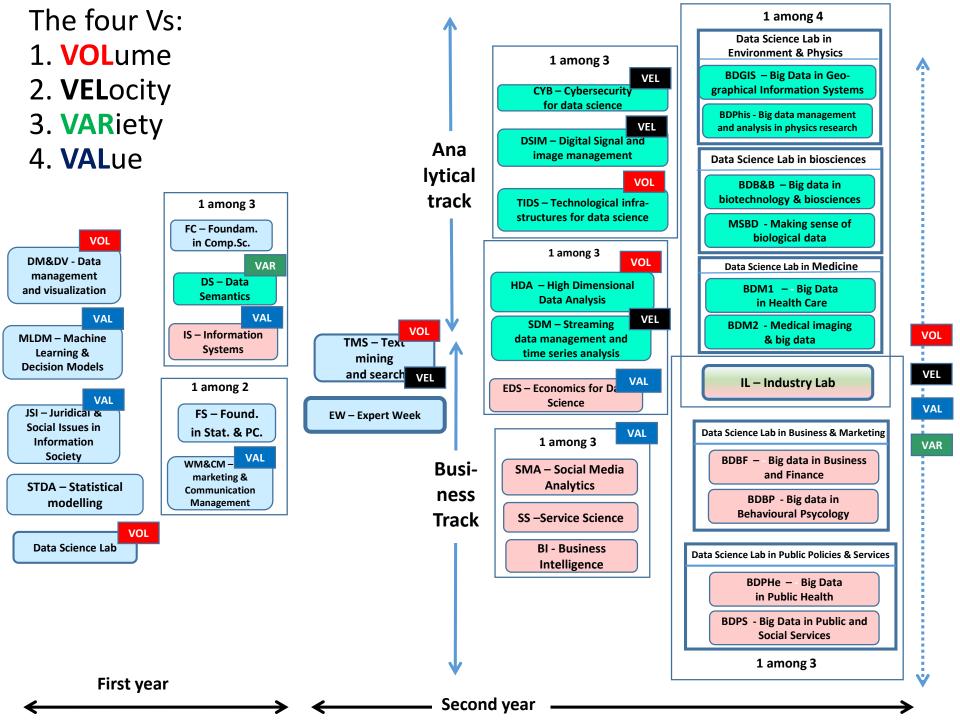
- **Participate in Dataset-specific competitions** organized by Companies **with economic reward**
- **Grow up Data Science skills** through practical experience on Datasets provided by Companies
- **Get Academic Credits**
- Know about **Job Offers**

Courses

Common courses

Analytical track

Business track

Ana lytical track

Busi- ness Track

First year

A Dynamic Evolving Science

First year courses (Common)

- DM&DV - Data management and visualization
- MLDM – Machine Learning & Decision Models
- JSI – Juridical & Social Issues in Information Society
- STDA – Statistical modelling
- DSL - Data Science Lab

1 among 3
- FC – Foundam. in Comp.Sc.
- DS – Data Semantics
- IS – Information Systems

1 among 2
- FS – Found. in Stat. & PC.
- WM&CM – Web marketing & Communication Management

- TMS – Text mining and search
- EW – Expert Week

Second year

1 among 3
- CYB – Cybersecurity for data science
- DSIM – Digital Signal and image management
- TIDS – Technological infra-structures for data science

1 among 3
- HDA – High Dimensional Data Analysis
- SDM – Streaming data management and time series analysis
- EDS – Economics for Data Science

1 among 3
- SMA – Social Media Analytics
- SS –Service Science
- BI - Business Intelligence

Labs

1 among 4

Data Science Lab in Environment & Physics
- BDGIS – Big Data in Geo-graphical Information Systems
- BDPhis - Big data management and analysis in physics research

Data Science Lab in biosciences
- BDB&B – Big data in biotechnology & biosciences
- MSBD - Making sense of biological data

Data Science Lab in Medicine
- BDM1 – - Big Data in Health Care
- BDM2 - Medical imaging & big data

- IL – Industry Lab

Data Science Lab in Business & Marketing
- BDBF – Big data in Business and Finance
- BDBP - Big data in Behavioural Psycology

Data Science Lab in Public Policies & Services
- BDPHe – Big Data in Public Health
- BDPS - Big Data in Public and Social Services

1 among 3

25

Scientific areas

Legend:
- Computer Science
- Statistics
- SocioEconomic
- Mixed

Ana lytical track

Busi- ness Track

Labs

First year

- DM&DV - Data management and visualization
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1 among 3
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Second year

- TMS – Text mining and search
- EW – Expert Week

1 among 3
- CYB – Cybersecurity for data science
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1 among 4

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- BDBP - Big data in Behavioural Psycology

Data Science Lab in Public Policies & Services
- BDPHe – Big Data in Public Health
- BDPS - Big Data in Public and Social Services

1 among 3

26

The four Vs:
1. **VOL**ume
2. **VEL**ocity
3. **VAR**iety
4. **VAL**ue

Analytical track

Business Track

First year

Second year

VOL — DM&DV - Data management and visualization

VAL — MLDM – Machine Learning & Decision Models

VAL — JSI – Juridical & Social Issues in Information Society

STDA – Statistical modelling

VOL — Data Science Lab

1 among 3
- FC – Foundam. in Comp.Sc.
- VAR — DS – Data Semantics
- VAL — IS – Information Systems

1 among 2
- FS – Found. in Stat. & PC.
- VAL — WM&CM – marketing & Communication Management

VOL / VEL — TMS – Text mining and search

EW – Expert Week

1 among 3
- VEL — CYB – Cybersecurity for data science
- VEL — DSIM – Digital Signal and image management
- VOL — TIDS – Technological infrastructures for data science

1 among 3
- VOL — HDA – High Dimensional Data Analysis
- VEL — SDM – Streaming data management and time series analysis
- VAL — EDS – Economics for Data Science

1 among 3
- VAL — SMA – Social Media Analytics
- SS – Service Science
- BI - Business Intelligence

1 among 4

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- BDPS - Big Data in Public and Social Services

1 among 3

VOL
VEL
VAL
VAR

Main Data Types

Legend (color key):
- Tables & Series
- Signals and images
- Knowledge graphs
- Loosely Str..&Semistr. texts
- Maps & Georef. data
- Not relevant

First year

DM&DV - Data management and visualization

MLDM – Machine Learning & Decision Models

JSI – Juridical & Social Issues in Information Society

STDA – Statistical modelling

DSL1 – Data Science Lab

DSL1 – Data Science Lab

1 among 3
- FS – Foundam. in Informatics
- DS – Data Semantics
- IS – Information Systems

1 among 2
- FS – Found. in Stat. & PC.
- WM&CM – Web marketing & Communication Management

TMS – Text mining and search

EW – Expert Week

Analytical track

1 among 3
- CYB – Cybersecurity for data science
- DSIM – Digital Signal and image managem.
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- TIDS – Technological infra-structures for data science

1 among 3
- HDA – High Dimensional Data Analysis
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Business Track

1 among 3
- SMA – Social Media Analytics
- SS –Service Science
- BI - Business Intelligence

Second year

1 among 4

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Labs

Data Science Lab in Business & Marketing
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Data Science Lab in Public Policies & Services
- BDPHe – - Big Data in Public Health
- BDPS - Big Data in Public and Social Services

1 among 3

28

Phases of the life cycle and main feedbacks

1. Access

2. Management

3. Visualization

4. Analysis

5. Diffusion

Main Phases of the Life Cycle

- **Access & Acquisition** (teal/green)
- **Management** (pink)
- **Visualization** (light blue)
- **Analysis** (yellow)
- **Diffusion & Usage** (dark green)
- **All** (blue)

Ana lytical track

Busi-ness Track

Labs

First year

- DM&DV - Data management
- DM&DV - Data visualization
- MLDM – Machine Learning & Decision Models
- JSI – Juridical & Social Issues in Information Society
- STDA – Statistical modelling
- DSL – Data Science Lab

1 among 3
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1 among 2
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Second year

1 among 3
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- BDPS - Big Data in Public and Social Services

1 among 3

30

Main Platforms and languages

SQL · R · Hadoop · Kaggle
NoSQL · SAS · Spark
Knime · Phyton
RDF & Sparql · BPMN

Ana lytical track

1 among 3
- CYB – Cybersecurity for data science
- DSIM – Digital Signal and image management
- Hadoop · Spark
- TIDS – Technological infra-structures for data science

1 among 3
- HDA – High Dimensional Data Analysis
- SDM – Streaming data management and time series analysis · R
- EDS – Economics for Data Science

Busi-ness Track

1 among 3
- SMA – Social Media Analytics
- SS –Service Science
- BI - Business Intelligence

1 among 4

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Labs

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Data Science Lab in Public Policies & Services
- BDPHe – Big Data in Public Health
- BDPS - Big Data in Public and Social Services

Phyton

1 among 3

Kaggle · NoSQL
DM&DV - Data management and visualization
Hadoop · Spark

Kaggle · Knime
MLDM – Machine Learning & Decision Models
R · Phyton

JSI – Juridical & Social Issues in Information Society

Kaggle
STDA – Statistical modelling
R · SAS

1 among 3
- FC – Foundam. in Comp. · SQL · Phyton
- Kaggle · DS – Data Semantics · RDF & Sparql
- IS – Information Systems · BPMN

1 among 2
- FS – Found. in Stat. & PC.
- WM&CM – Web marketing & Communication Management · Kaggle

DSL - Data Science Lab
SAS · Kaggle

TMS – Text mining and search
EW – Expert Week

First year ◄─────► **Second year** ◄────────►

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Studenti Erasmus in partenza 2018-19

- Stockolm (Svezia)   5
- Klagenfurt (Austria)   5
- Skovde (Svezia)   2
- Nijmegen (Olanda)   2
- Antwerp (Belgio)   1

Course organization and required skills

Degree in..	Degree in..	Degree in..	Degree in..	...	Degree in..

At least 30 credits in informatics and/or statistics and/or mathematics and/or physics

First year

Basics in Informatics*	Basics in Statistics*

Advanced techniques & technologies

Lab course in generic domain

Analytical Track	Business Track

Second year

Lab in vertical domains

* If needed

Conoscenza della lingua inglese

Occorre:

- aver superato, nell'ambito della carriera universitaria, un esame di lingua inglese di almeno 4 cfu, oppure

- conseguito l'open badge "Inglese B2» dell'Ateneo di Milano Bicocca;

- conseguito una laurea di primo livello erogata interamente o prevalentemente in lingua inglese.

Students Portfolio + Linkedin

- https://www.linkedin.com/pulse/building-data-science-portfolio-newcomers-guide-data-scientist

Building a Data Science Portfolio: A Newcomer's Guide
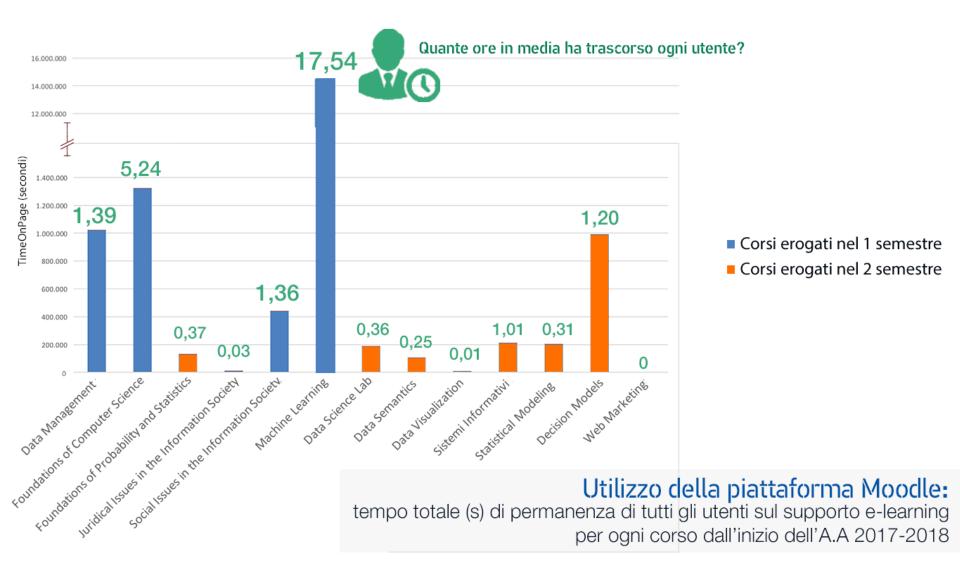
Aziende e PA con cui sono stipulati o in corso di preparazione accordi didattici

- A2A
- Accenture
- Assolombarda
- Bosh
- Cefriel
- Cerved
- Comune di Milano
- Danieli
- Fastweb
- **Fondazione Tronchetti Provera devolve 24.000 euro per contributi allo studio**
- Mipu
- Oracle
- Pirelli
- RE Analytics
- SAS
- Vodafone
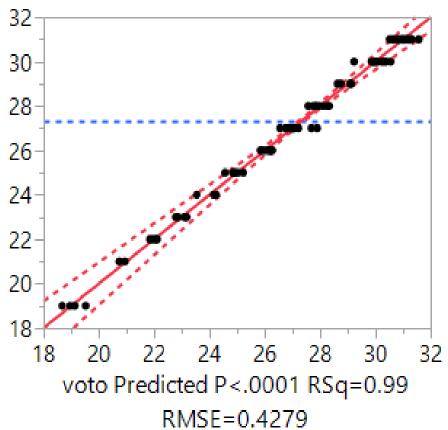
Data Science per la Data Science

Alta correlazione tra uso dei servizi didattici eLearning e voto di profitto

Actual by Predicted Plot

voto Actual

voto Predicted P<.0001 RSq=0.99 RMSE=0.4279

Summary of Fit

RSquare	0.993802
RSquare Adj	0.983421
Root Mean Square Error	0.427893
Mean of Response	27.32407
Observations (or Sum Wgts)	108

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	67	1174.3337	17.5274	95.7297
Error	40	7.3237	0.1831	**Prob > F**
C. Total	107	1181.6574		<.0001*

Siete tutti invitati al secondo Open day di Data Science
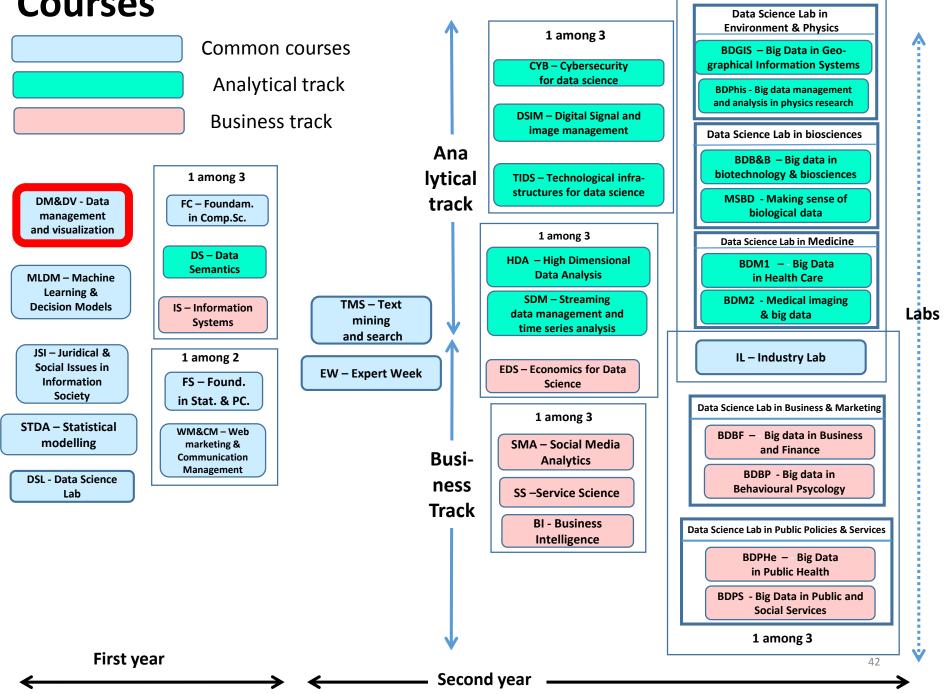
Siete tutti invitati al secondo Open day di Data Science – 22 Maggio 2018 – Aula Magna U6

- Ore 9.15 – 9.40 Carlo Batini - Il corso di laurea in Data Science compie un anno – Esperienze e nuovi progetti

- Ore 9.40 – 10.00 Roberto Bernabò – Il Data Jouralism al Sole 24 Ore

- Ore 10.00 – 10.20 Fabio Stella - Le sfide su Kaggle nel corso di Machine Learning e la nuova professione del Data Scientist

- Ore 10.20 – 10.40 Matteo Pelagatti -Studenti e Aziende a confronto nel primo corso di Laboratorio

- Ore 11 Marco Tronchetti Provera – La Data Science @ Pirelli
- Premiazione otto contributi allo studio agli studenti di Data Science

Volete saperne di più?

http://datascience.disco.unimib.it/

Courses

Common courses

Analytical track

Business track

Analytical track

Business Track

Labs

First year

Second year

DM&DV - Data management and visualization

MLDM – Machine Learning & Decision Models

JSI – Juridical & Social Issues in Information Society

STDA – Statistical modelling

DSL - Data Science Lab

1 among 3
FC – Foundam. in Comp.Sc.

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HDA – High Dimensional Data Analysis

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EDS – Economics for Data Science

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SMA – Social Media Analytics

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1 among 4
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Data Science Lab in Business & Marketing

BDBF – Big data in Business and Finance

BDBP - Big data in Behavioural Psycology

Data Science Lab in Public Policies & Services

BDPHe – Big Data in Public Health

BDPS - Big Data in Public and Social Services

1 among 3

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Left over

Aziende e PA con cui sono stipulati o in corso di preparazione e stipula accordi didattici

- A2A
- Assolombarda
- Bosh
- Cefriel
- Cerved
- Comune di Milano
- Danieli
- Fasweb
- Fondazione Tronchetti Provera
- Fastweb
- Mipu
- Oracle
- Pirelli
- RE Analytics
- SAS
- Vodafone

Data Science vs Artificial Intelligence
su Google Trends

data science   artificial intelligence   Tutto il mondo, 2004 - Present

Data Science vs **Artificial Intelligence**
Food and beverages

Data Science vs **Artificial Intelligence**
Sciences
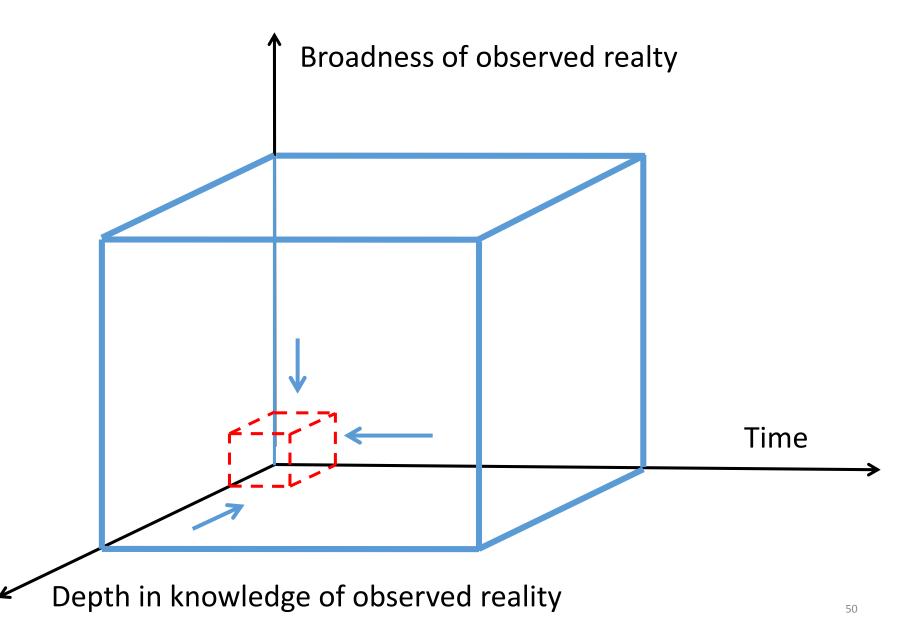
Glassdoor 50 Best Jobs In America, 2018

| Ranking	Job	Median Base Salary	Job Score (5.0 scale)	Job Satisfaction (5.0 scale)	Job Openings
1	Data Scientist	$ 110,000	4.8	4.2	4,524
2	DevOps Engineer	$ 105,000	4.6	4	3,369
3	Marketing Manager	$ 85,000	4.6	4	6,436
4	Occupational Therapist	$ 74,000	4.5	4	11,903
5	HR Manager	$ 85,000	4.5	3.9	4,458
6	Electrical Engineer	$ 76,000	4.5	3.9	5,839
7	Strategy Manager	$ 135,000	4.5	4.2	1,195
8	Mobile Developer	$ 90,000	4.5	4.1	1,809
9	Product Manager	$ 113,000	4.4	3.7	7,531
10	Manufacturing Engineer	$ 72,000	4.4	4	4,241
11	Compliance Manager	$ 96,000	4.4	4.3	1,222
12	Finance Manager	$ 116,000	4.4	3.8	2,998
13	Risk Manager	$ 97,000	4.4	4.2	1,209
14	Business Development Manager	$ 75,000	4.4	3.9	4,060
15	Front End Engineer	$ 100,000	4.4	4.2	1,222
16	Site Reliability Engineer	$ 120,000	4.4	4.1	1,064
17	Mechanical Engineer	$ 75,000	4.4	3.8	5,079
18	Analytics Manager	$ 115,000	4.4	3.9	1,381
19	Tax Manager	$ 110,000	4.4	3.7	3,309
20	Creative Manager	$ 110,000	4.3	4.3	824
21	Software Engineer	$ 102,500	4.3	3.6	29,187
22	Hardware Engineer	$ 115,000	4.3	4.2	806
23	Corporate Recruiter	$ 65,000	4.3	4.3	2,330
24	QA Manager	$ 92,000	4.3	3.8	1,741
25	Physician Assistant	$ 104,000	4.3	3.6	5,517
26	Database Administrator	$ 94,000	4.3	3.8	2,370
27	UX Designer	$ 90,000	4.3	3.8	1,963
28	Nursing Manager	$ 84,660	4.3	3.7	4,209
29	Engagement Manager	$ 115,000	4.3	3.7	2,169
30	Solutions Architect	$ 125,000	4.2	3.6	3,325
31	Process Engineer	$ 78,000	4.2	3.8	3,033
32	Reliability Engineer	$ 92,000	4.2	4.3	747
33	Data Engineer	$ 100,000	4.2	3.7	2,816
34	Operations Manager	$ 65,000	4.2	3.8	13,706
35	Speech Language Pathologist	$ 72,000	4.2	3.7	11,573
36	Communications Manager	$ 80,000	4.2	3.9	1,380
37	Audit Manager	$ 100,000	4.2	3.7	1,951
38	Data Analyst	$ 60,000	4.2	3.9	4,729
39	Systems Analyst	$ 75,000	4.2	3.7	2,710
40	Facilities Manager	$ 75,000	4.2	3.8	2,139
41	Strategic Account Manager	$ 85,000	4.2	4.1	808
42	Business Intelligence Developer	$ 86,000	4.1	3.9	882
43	Business Analyst	$ 71,000	4.1	3.6	9,603
44	Accounting Manager	$ 82,000	4.1	3.6	3,273
45	UI Developer	$ 95,000	4.1	3.8	1,004
46	Executive Assistant	$ 55,000	4.1	3.9	4,684
47	Management Consultant	$ 110,000	4.1	3.8	1,024
48	Project Manager	$ 80,000	4.1	3.5	23,274
49	Nurse Practitioner	$ 100,000	4.1	3.5	8,510
50	HR Generalist	$ 57,210	4.1	3.9	2,705
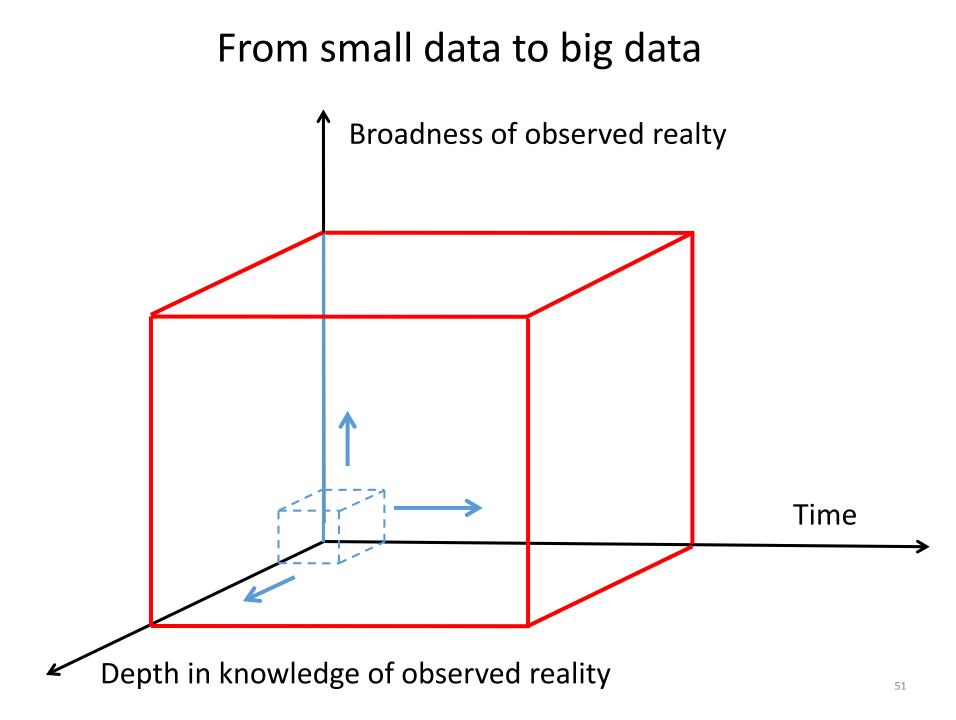
Internazionalizzazione

Accordi con Università di

- Stoccolma
- Skodge
- Klagenfurt

- In istruttoria Double degree con
  - Klagenfurt

Small data: from the Universe to a Sample

Broadness of observed realty

Time

Depth in knowledge of observed reality

From small data to big data

Broadness of observed realty

Time

Depth in knowledge of observed reality

Opportunities of collaboration for companies

- Training activities
    1. Testimonials and Case studies
    2. Teaching in the first year «Data Science Lab» and in the second year «Industry Lab»
    3. Hackathons
    4. Certifications
- Internships
- Final thesis

Other types of contributions from companies

To Students
- Scolarships
- Grants for
1. Internships in Italian companies
2. Internships in European universities or companies (Erasmus programs)
3. Internships in extra-European universities or companies (Extra programs)
- Degree Awards

Training services
- Access to big data infrastructures
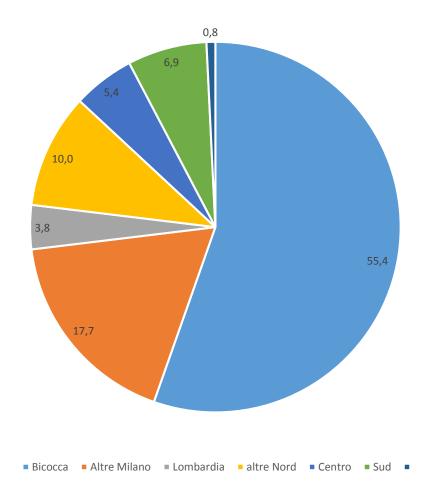
Communication and Marketing
- Endorsement
- Donations (with tax benefit)

Start-ups
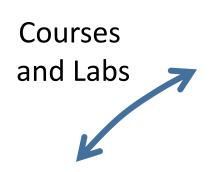
- All students should consider the opportunity to create a startup
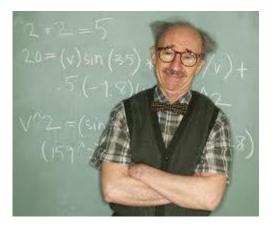
Statistics on enrolled Students - 2

Per area geografica di provenienza

■ Bicocca	■ Altre Milano	■ Lombardia	■ altre Nord
■ Centro	■ Sud	■	

The three stakeholders, students, companies, teachers: how to boost cooperation among them?

Courses
and Labs

Expert week

Schedule		Day	From to	Proponent	Speaker	Affiliation	Title
26-feb	morning	Monday	9-11	Batini	Ceri	Politecnico di Milano	**Modeling and Analyzing Big Genomic Data**
		Monday	11-12	Batini	Canakoglu	Politecnico di Milano	**Modeling and Analyzing Big Genomic Data**
		Monday	12-13	Mauri	Policriti	Università di Udine	**Bioinformatics and Sequencing**
26-feb	afternoon	Monday	14-16	Batini	Schettini	Milano Bicocca	**Modeling and recognition of visual data using CNNs**
		Monday	16-18	Pelagatti	Iacus	Voices on the Blogs	**How to create new value with Data Science? Challenges and perspectives of an old yet new discipline**
27-feb	morning	Tuesday	9-11	Batini	Fancalanci	Politecnico di Milano	**E2MC: exploiting social media for rapid mapping during emerg.**
		Tuesday	11-13	Batini	Scannapieco	Istat	**New sources for Official Statistics: IT Challenges**
27-feb	afternoon	Tuesday	14-16	Batini	Zardetto	Istat	**Methodological Issues in Big Data Processing for Official Stats.**
28-feb	morning	Wednesday	9-10.30	Vittadini	Martini	Unigrà	**The use of big data in air transportation networks**
		Wednesday	10.30-12	Vittadini	Ricci	Invalsi	**Data fo the educational policies**
			12-13	Batini	Misuriello	Esri	**The science of where from Analytics to Artificial Intelligence, through the IOT**
28-feb	afternoon	Wednesday	14-16	Batini	Fuggetta	Cefriel	**E01 Ecosystem: Unlocking Business Value**
		Wednesday	16-17	Vittadini	Albini	JHC	**The use of all data of an hospital for quality and research**
01-mar	morning	Thursday	9-11	Stella	M. Zancker	Univ. Bolzano	**Recommendation Systems - Challenges for Data Scientists**
		Thursday	11-12	Maurino	Tremolada	Sole 24 Ore	**Data Journalism**
		Thursday	12-13	Batini	D. Porro	Milano Bicocca	**Turning ideas into projects and innovation into Country's success**
01-mar	afternoon	Thursday	14-17	Seminar "The gender gap in education and research"			
01-mar	afternoon	Thursday	14-15	Batini	Baccarin	Mipu	**What do we do tonight? What we do every night: try to conquer the world. Five unexpected sources of bias to manipulate our vision**
01-mar	afternoon	Thursday	15-16	Batini	Milani	to be completed	**Experiences in University/Private sector collaborations on gender gap issues: past, present and future (to be confirmed)**
01-mar	afternoon	Thursday	16-17	Batini	Rula	Milano Bicocca	**Networking Networking Women**
02-mar	morning	Friday	9-11	Seminar "Myths and Reality of Artificial Intelligence"			
	morning	Friday	11-13	Chiarperson: Giulio Giorello - i - Discussant: R. Cingolani, P. Dario, D. de Kerkhove, S. Bandini, G. De Michelis, D. Orba			

EW – Expert Week