

Artificial Intelligence (AI) Deep Learning

IFU / 2018-02-23

Agenda

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1. About us
2. The Age of Artificial Intelligence Is Here.
3. All That Data (Big Data)
4. Pattern Recognition (Learning vs. Programming)
5. Artificial Intelligence in Medical Research
6. Is Artificial Intelligence Over-Hyped?

About us

1/6

About us

seantis gmbh

seantis is building high quality **data-driven web applications** with an open-source toolset and an agile mindset for **medical research**, the **aviation industry**, and the **public sector**.

Fabian Reinhard (M A UZH), Managing Partner

Fabian holds a Master's degree in Political Sciences and Economics from the University of Zurich and has received Executive Education from Harvard University.

Dr. Tobias Reinhard (dipl. inform. UZH), Partner

Tobias received a Master of Science in Informatics from the University of Zurich where he also graduated with a PhD degree.

Our Platform

HealthData.ai - Platform for medical cohort studies



20'000 Patients



100'000 Visits (follow ups)



400 Institutions (hospitals)



5 Countries (Switzerland, France, Belgium, Morocco, Armenia)



1'000 Users (health care professionals)



100'000 X-Ray Images



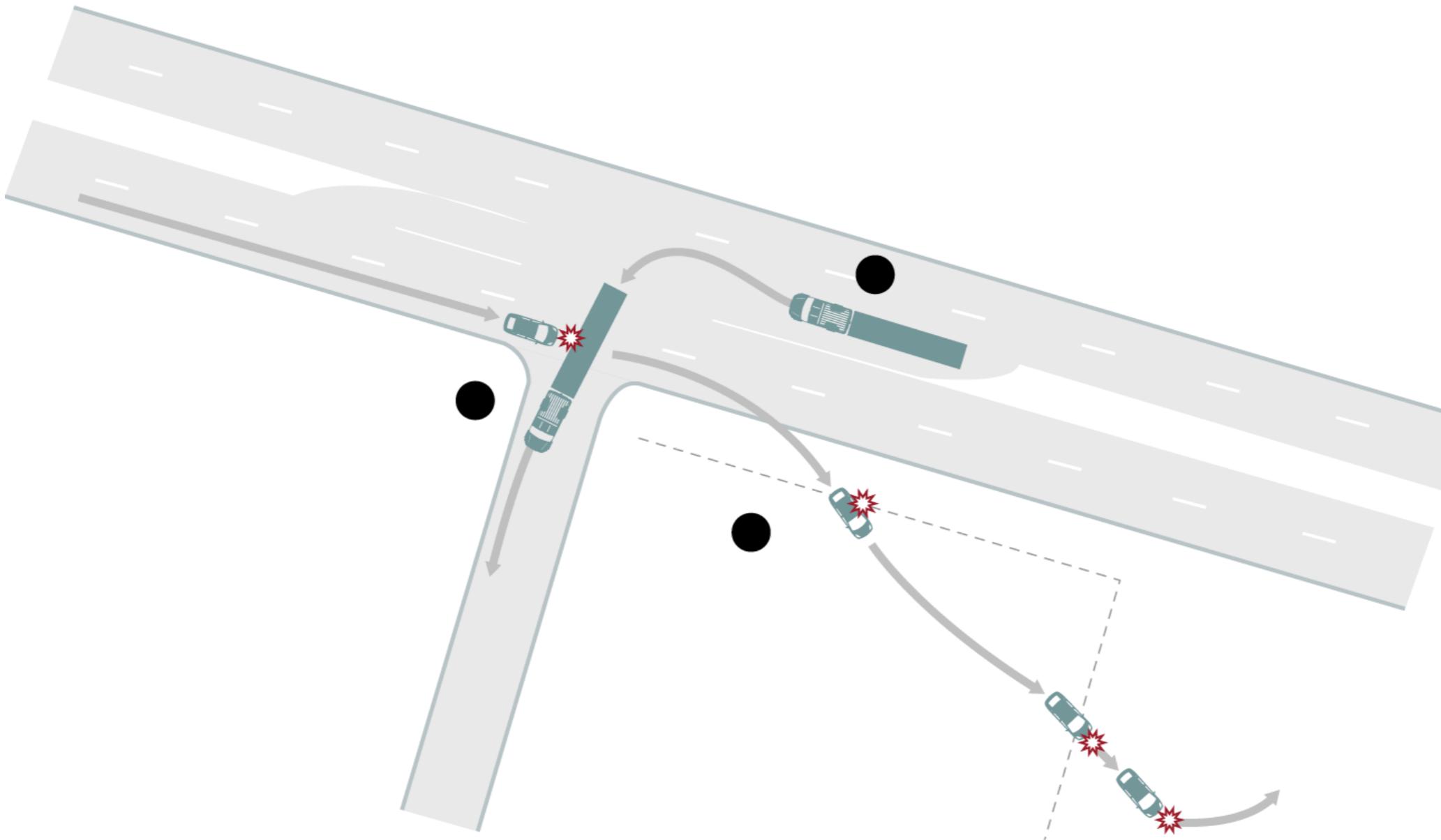
50'000 Bio Samples

The Age of Artificial Intelligence Is Here.

2/6

Tesla Crash

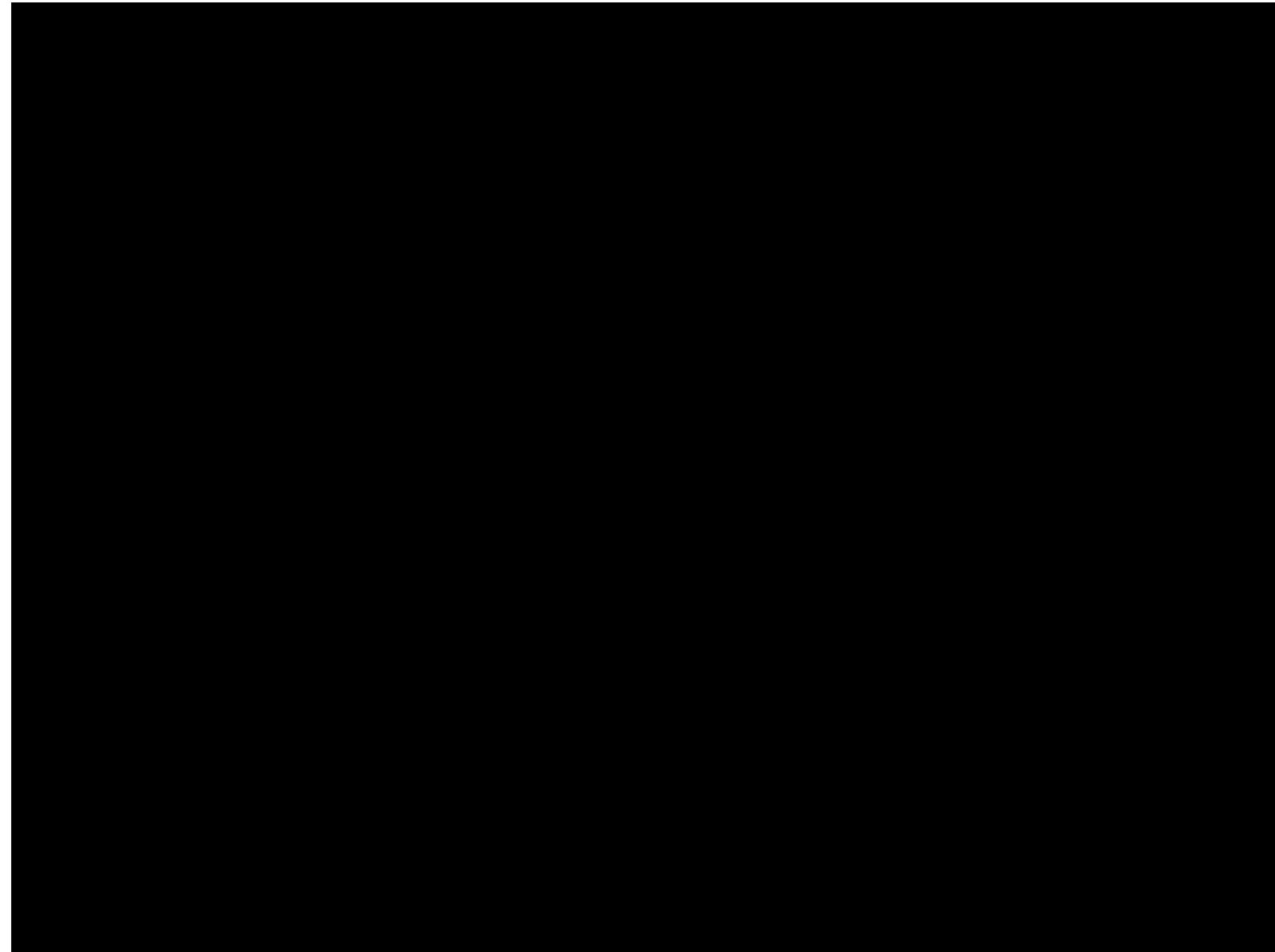
2016 - Tesla's Self-Driving System Cleared in Deadly Crash



<https://www.nytimes.com/2017/01/19/business/tesla-model-s-autopilot-fatal-crash.html>

DARPA Grand Challenge

Defense Advanced Research Projects Agency



DARPA 2004

Mojave Desert
0 Finishers

DARPA 2005

5 Finishers

DARPA 2007

Urban Challenge: traffic regulations, traffic

Tesla 2016

First fatal crash after 130m miles (average 94m miles)

All That Data (Big Data)

3/6



What is Big Data?



CISSP Googling @cissp_googling · 9. Nov. 2015
how big is big data

85 109

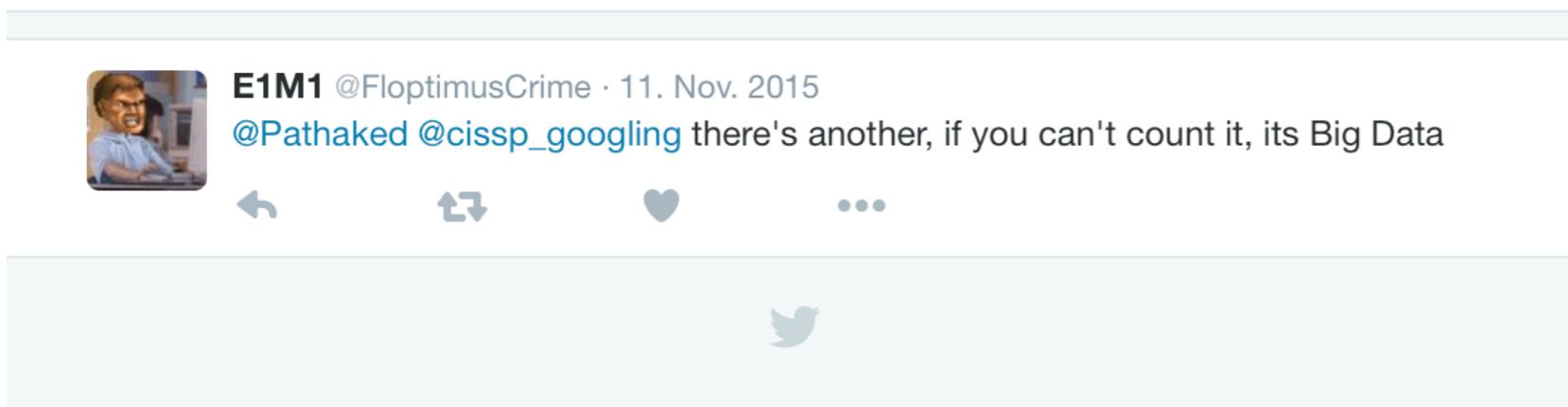


Pathaked
@Pathaked

[Folgen](#)

@cissp_googling @FloptimusCrime Some saint once said, "Big data is simply anything that won't fit in Excel."

23:55 - 11. Nov. 2015



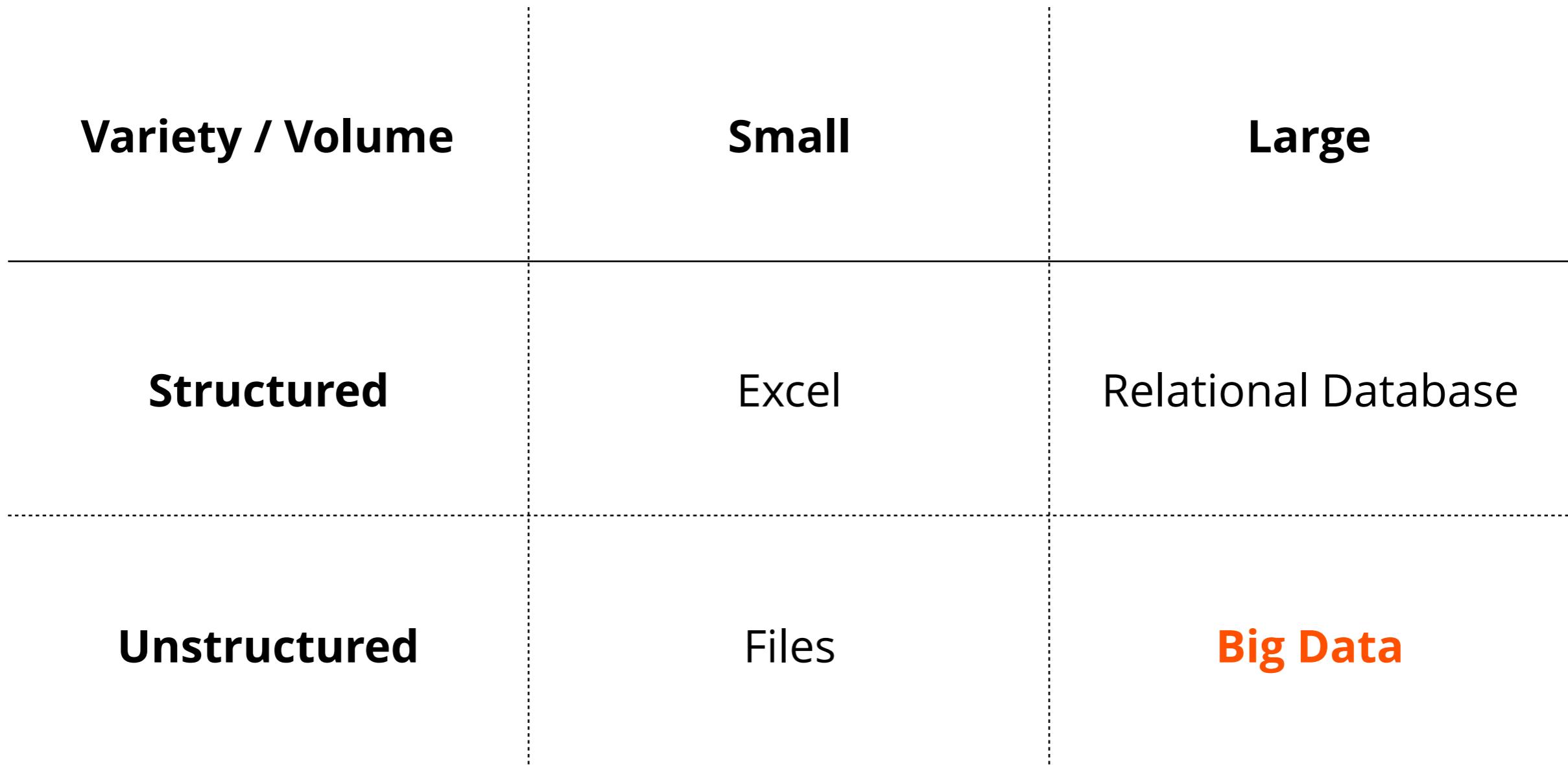
E1M1 @FloptimusCrime · 11. Nov. 2015
@Pathaked @cissp_googling there's another, if you can't count it, its Big Data

85 109

[Twitter](#)

[https://twitter.com/Pathaked/
status/664713086314508288](https://twitter.com/Pathaked/status/664713086314508288)

Big Data vs. Small Data

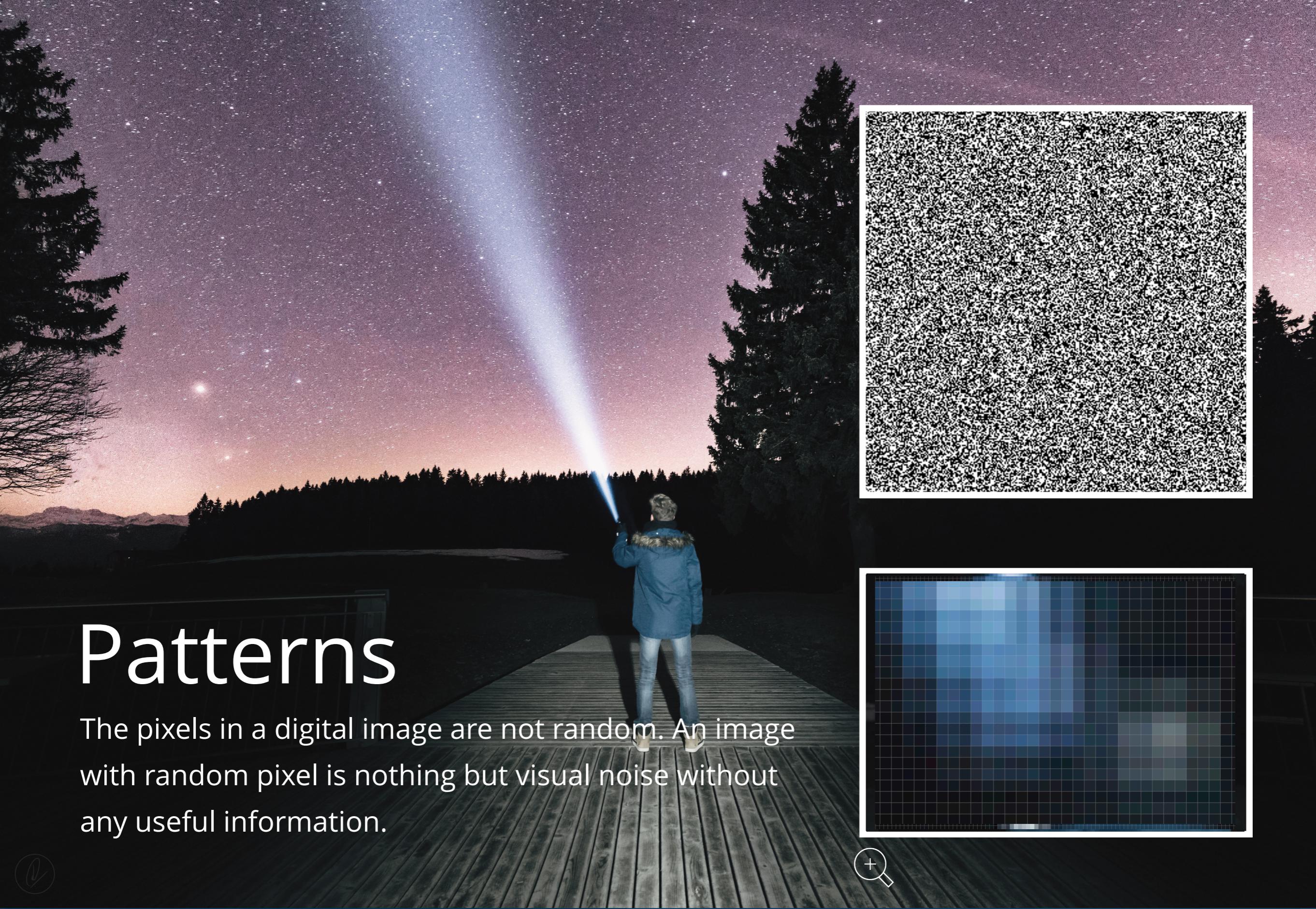


Garbage in - Garbage out



Pattern Recognition (Learning vs. Programming)

4/6



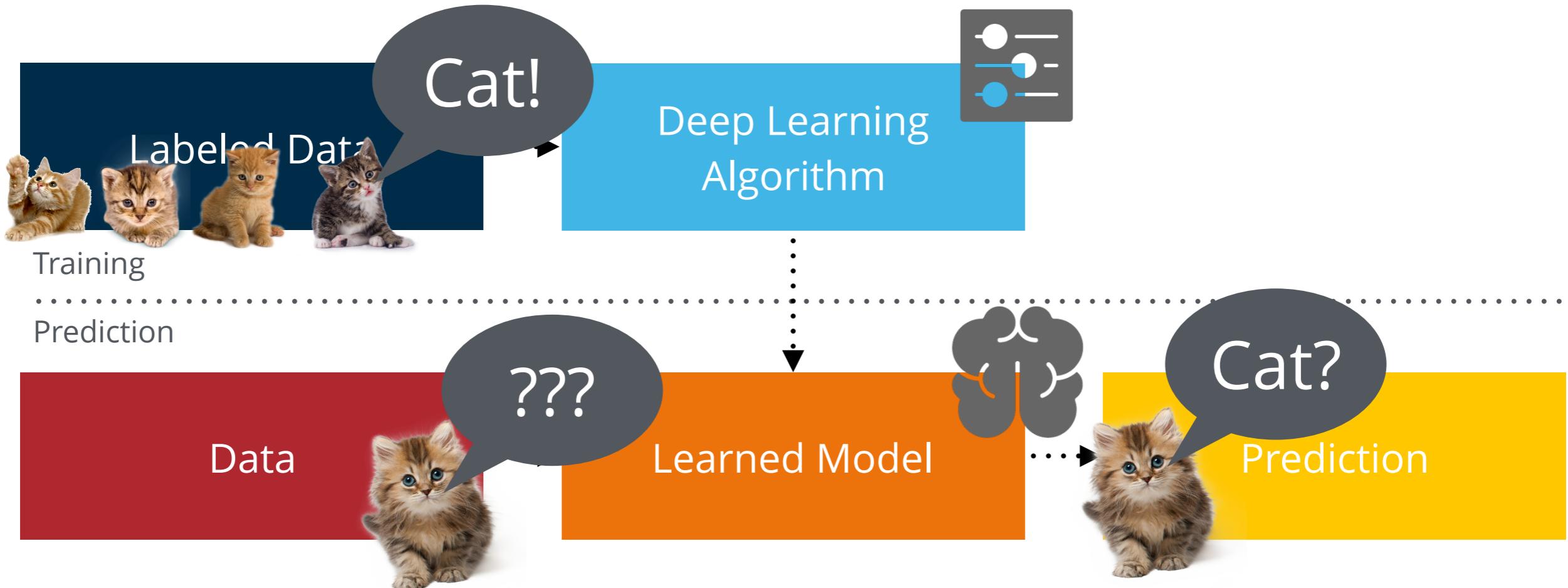
Patterns

The pixels in a digital image are not random. An image with random pixel is nothing but visual noise without any useful information.



Pattern-Recognition Machines

Machine Learning is a type of Artificial Intelligence that provides computers with the ability to **learn without being explicitly programmed**.



<https://www.wired.com/2012/06/google-x-neural-network/>

Computers are exacting...

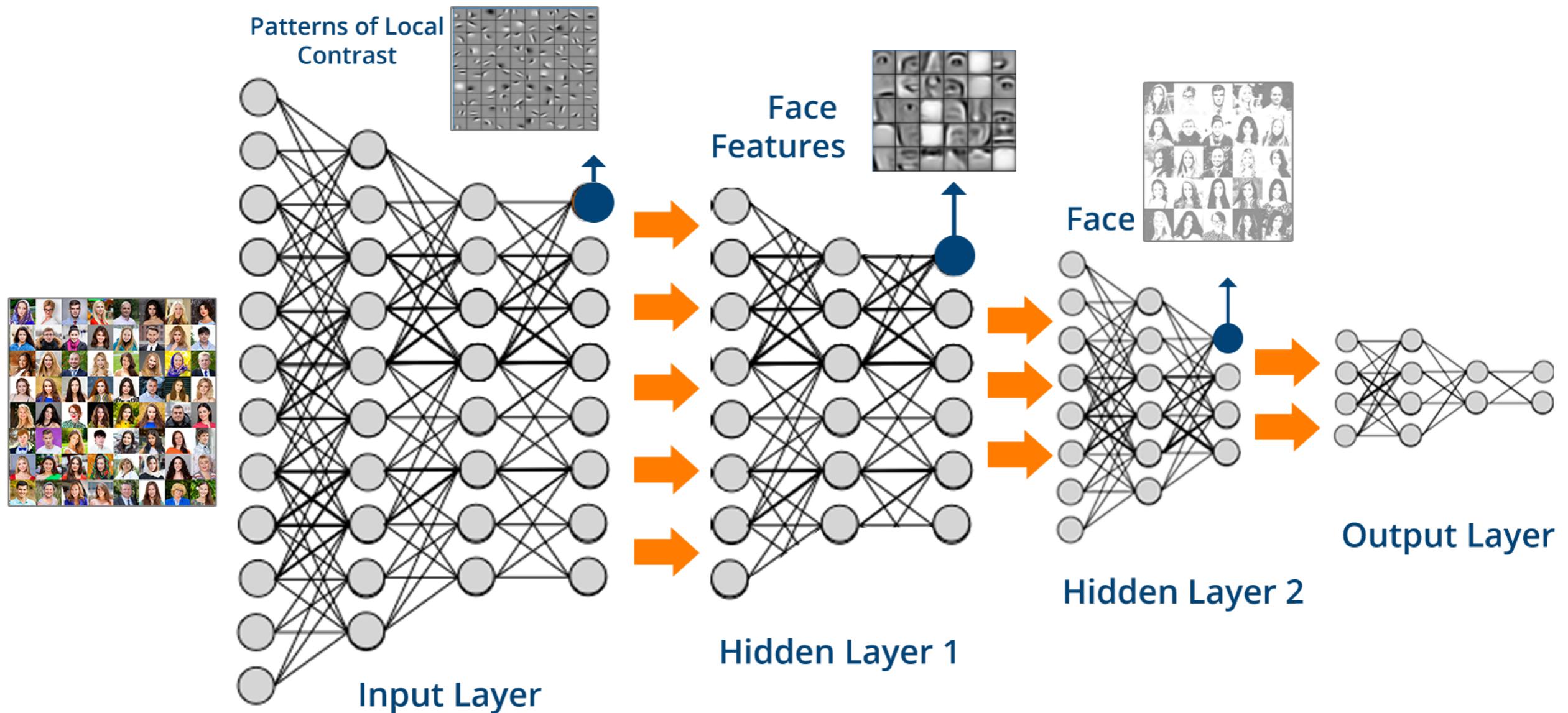
```
1 # Fibonacci series up to n
2 def fib(n):
3     a, b = 0, 1
4     while a < n:
5         print(a, end=' ')
6         a, b = b, a+b
7     print()
```

they will do exactly
what you program them
to do, nothing more,
nothing less!

<https://www.quora.com/Why-is-programming-so-hard-1>

Neural Network

Neurons & Synapses



Artificial Intelligence in Medical Research

5/6

Rheumatoid Arthritis: Joint Erosions

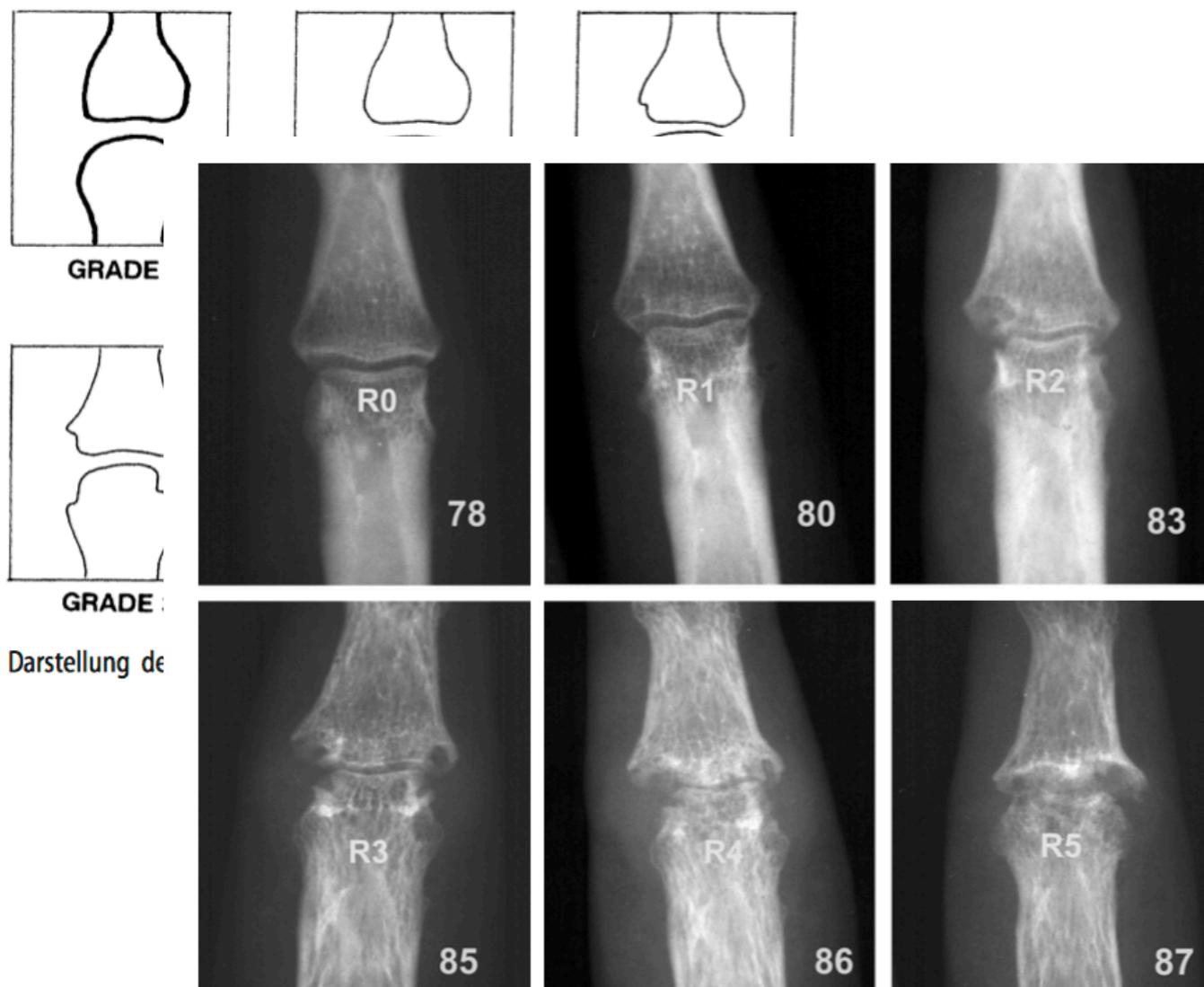
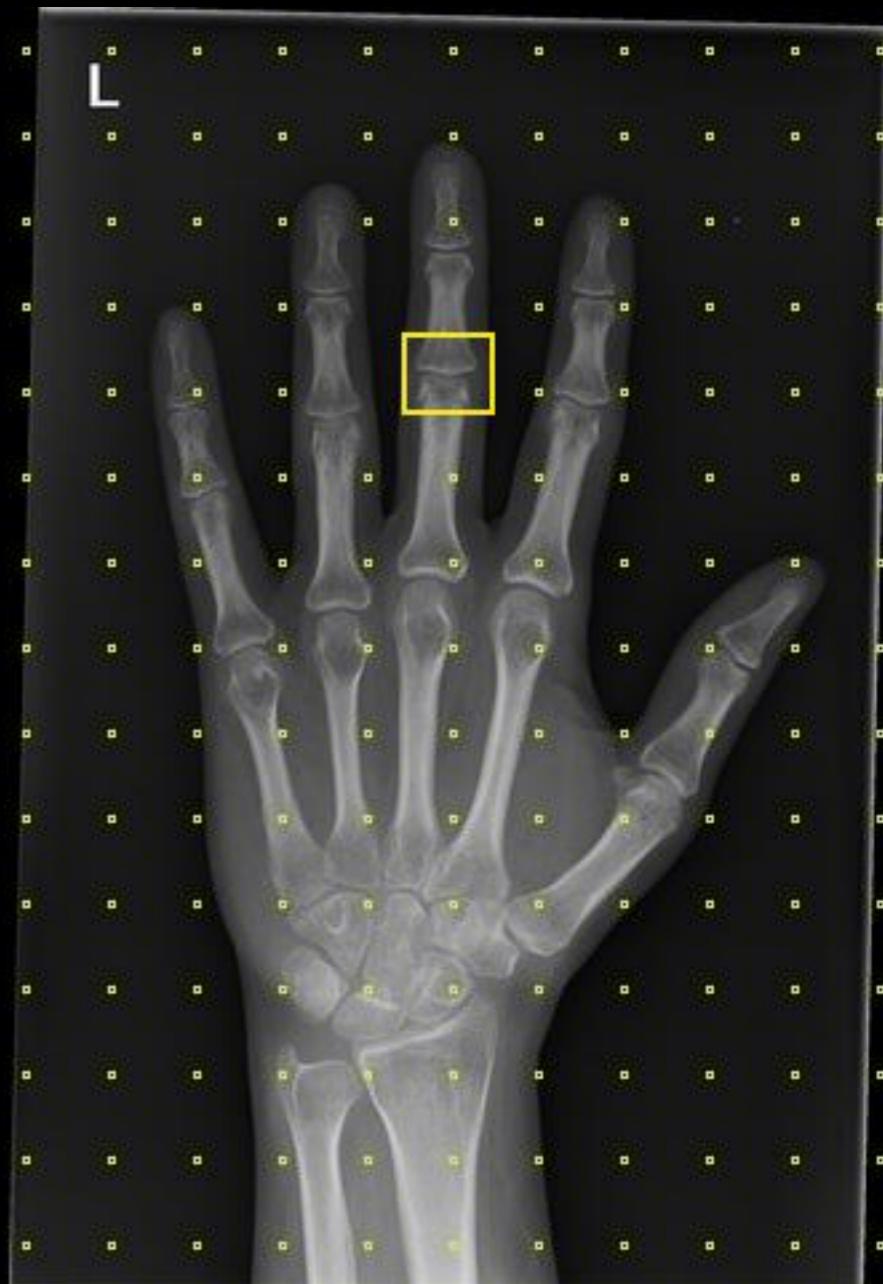
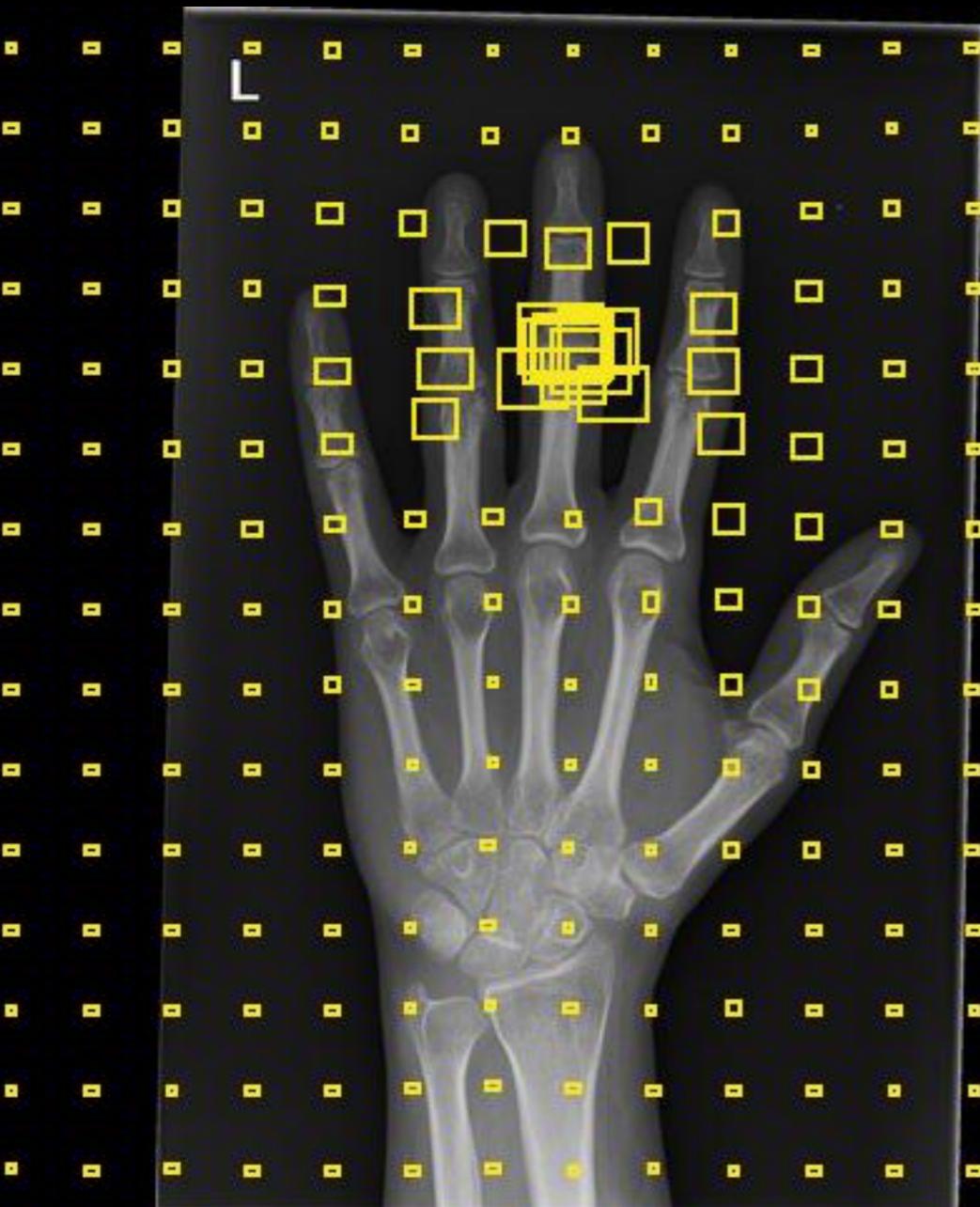


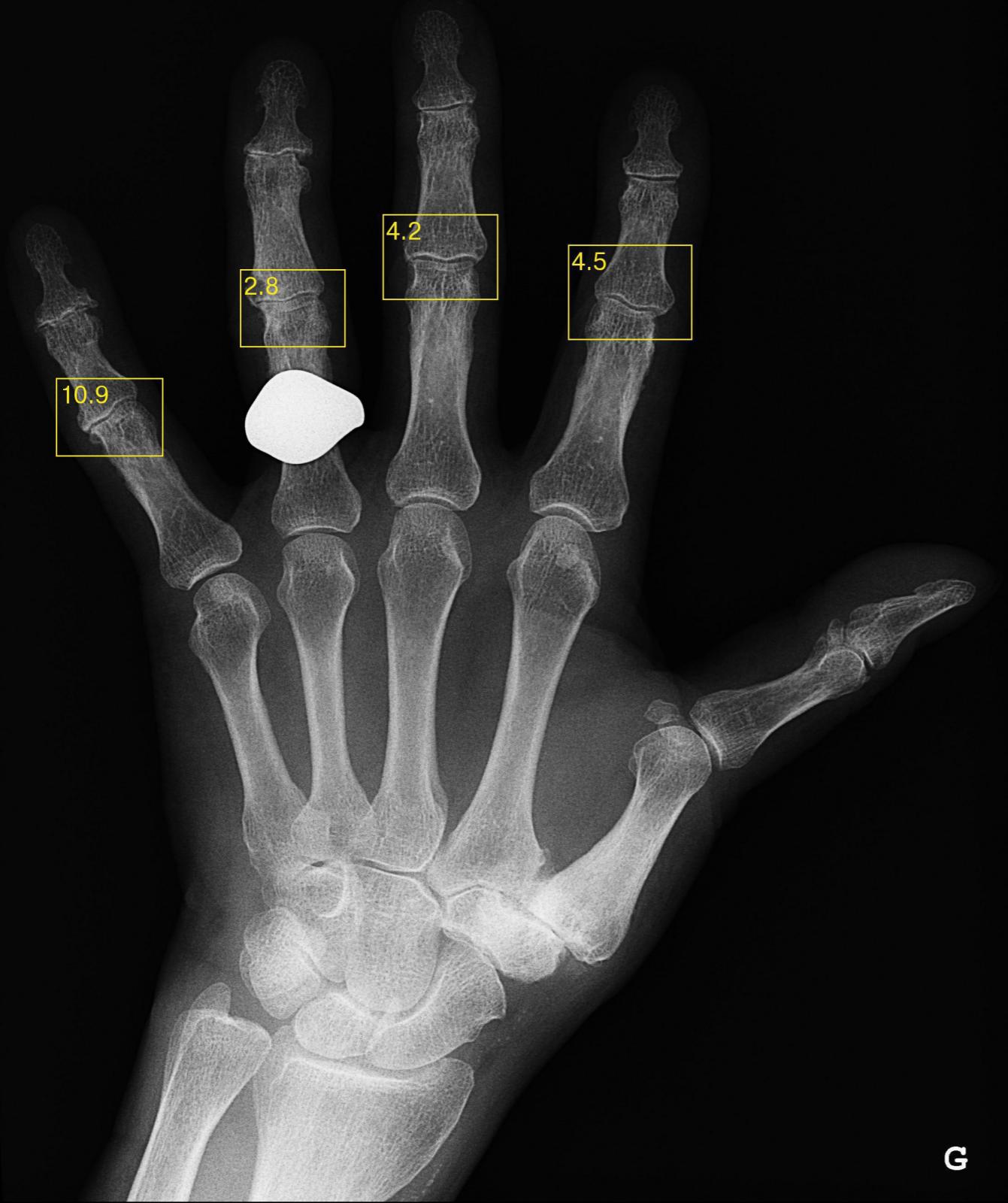
Abb. 2.2. Schematische Darstellung der Modifikation [13]

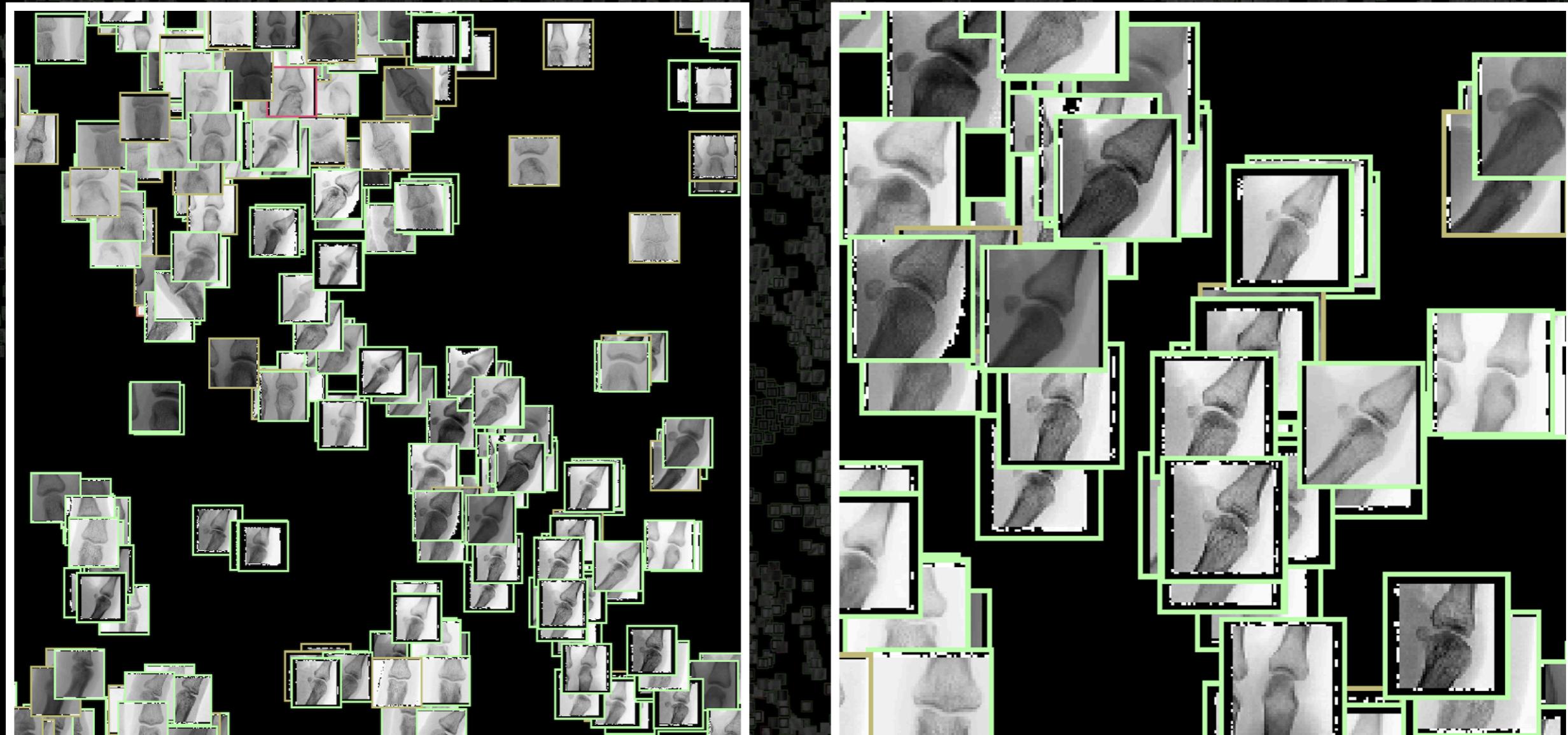
Abb. 2.5. Beispiele von Röntgenbildern des PIP-Gelenks III der gleichen Patientin (E, I) in den verschiedenen Stadien des Ratingen-Scores

R. Rau, S. Wassenberg 2007:
Scoringmethoden bei der
rheumatoide Arthritis

[http://dgrh.de/fileadmin/media/
Die_DGRH/Publikationen/
Bildgebende_Verfahren/
KAPITEL02.pdf](http://dgrh.de/fileadmin/media/Die_DGRH/Publikationen/Bildgebende_Verfahren/KAPITEL02.pdf)







Is Artificial Intelligence Over-Hyped?

6/6

1964

1978

2017



https://twitter.com/page_eco/status/932589547375837189

Emerging Technology Hype Cycle



«We tend to **overestimate** the effect of a technology in the **short run** and **underestimate** the effect in the **long run.**»

- Roy Amara

gartner.com/SmarterWithGartner

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Thank you!

Questions?

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