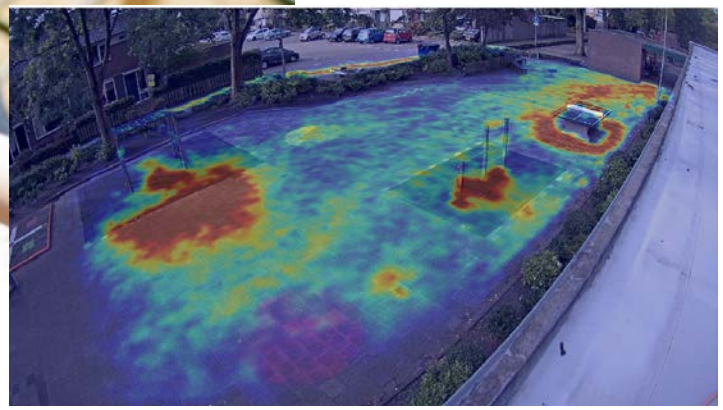
Winning with Data Science

Joost N. Kok

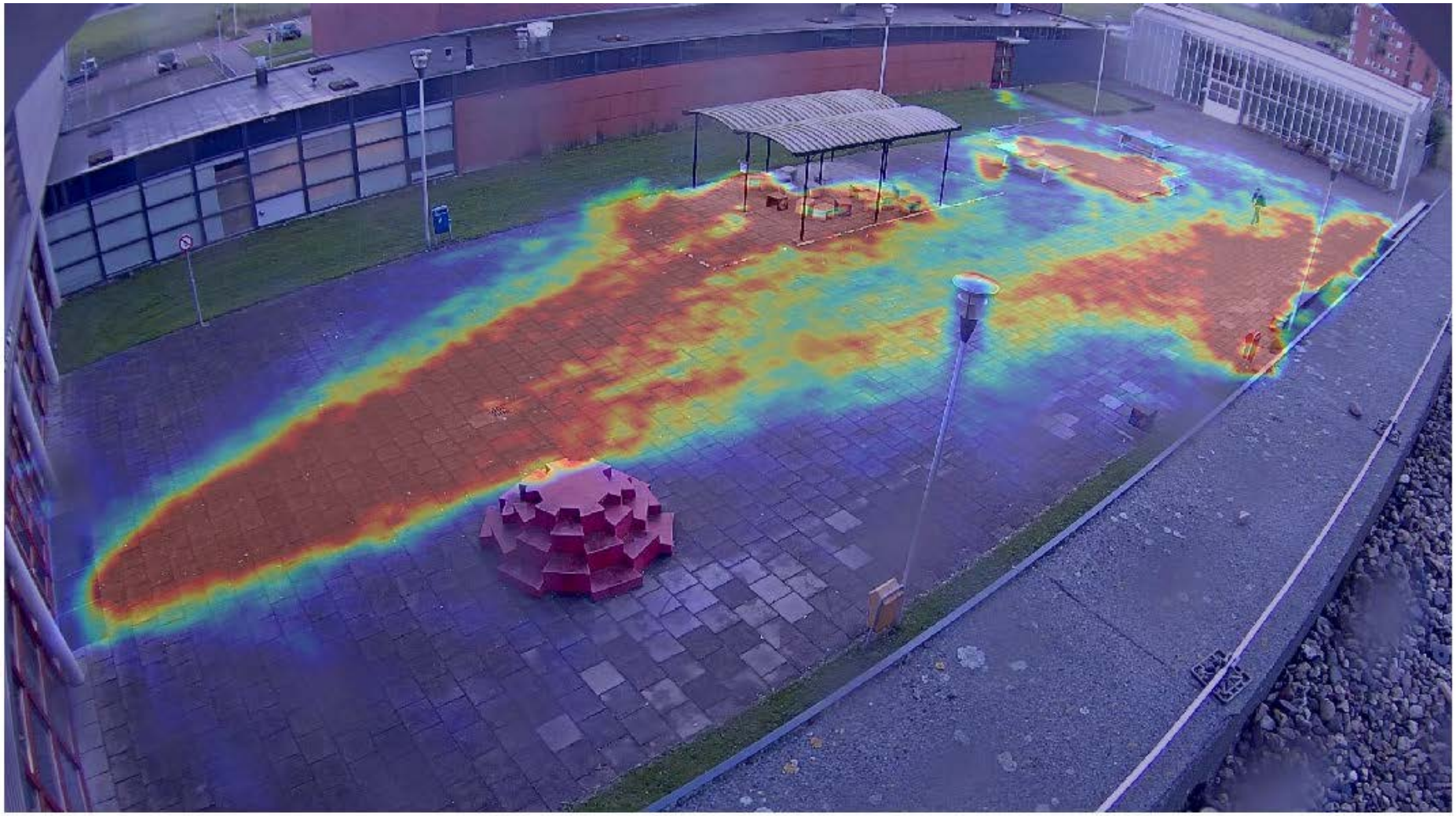
ABSTRACT
Starting pre-school is a major stepping stone for children's peer relations. Yet, some children spend their recess time alone, albeit in the presence of playful peers. These solitary behaviours have been noted in the literature as an alarm signal for a maladaptive social development. In this study, we identified four kinds of non-social behaviours engaged at recess (reticent, solitary-pretend, -functional, and -passive); and we examined the extent to which these different behaviours were related to social solitude at the playground six months later. Therefore, 97 children (aged 4–6 years old) were observed at the playground and their social-emotional skills were tested. Solitude was assessed through an innovative measuring method, based on Radio Frequency Identification Devices. The results demonstrated that solitary-pretend play in girls was related to an increase in solitary behaviours later on. Nevertheless, children who engaged in non-social behaviours showed a general lack of emotional skills, which may explain their initial withdrawal.



Using sensors to measure playground dynamics

18 January 2016

How do playground interactions contribute to children's social competence?



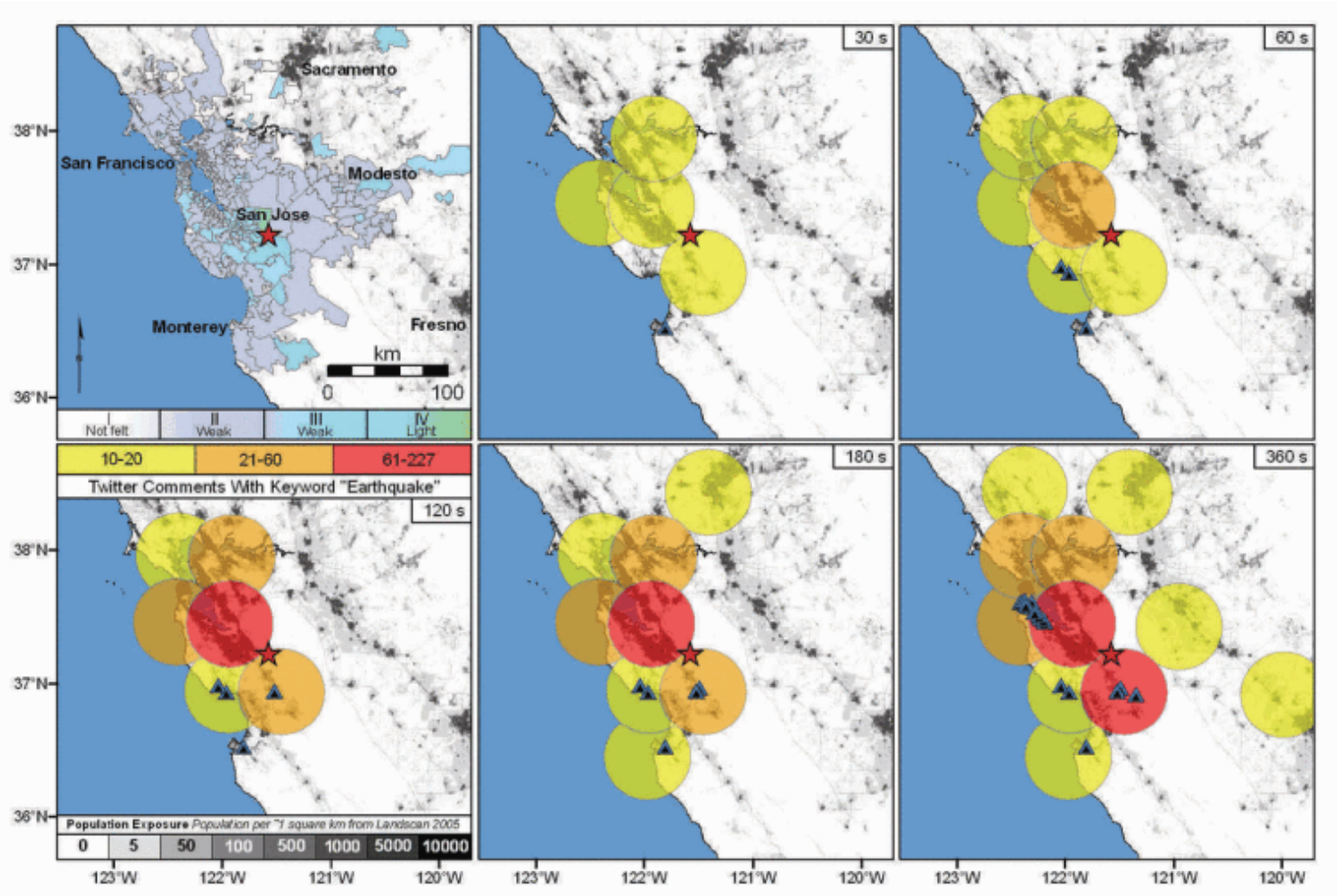
publications.tno.nl/publication/34616450/tHet1v/vlasblom-2014-intelligente.pdf

Computational Turn

- Correlations follow directly from the data
- Data easy available
- Progress in computational methods

- Reason about correlations to find causalities

Twitter: earth quakes



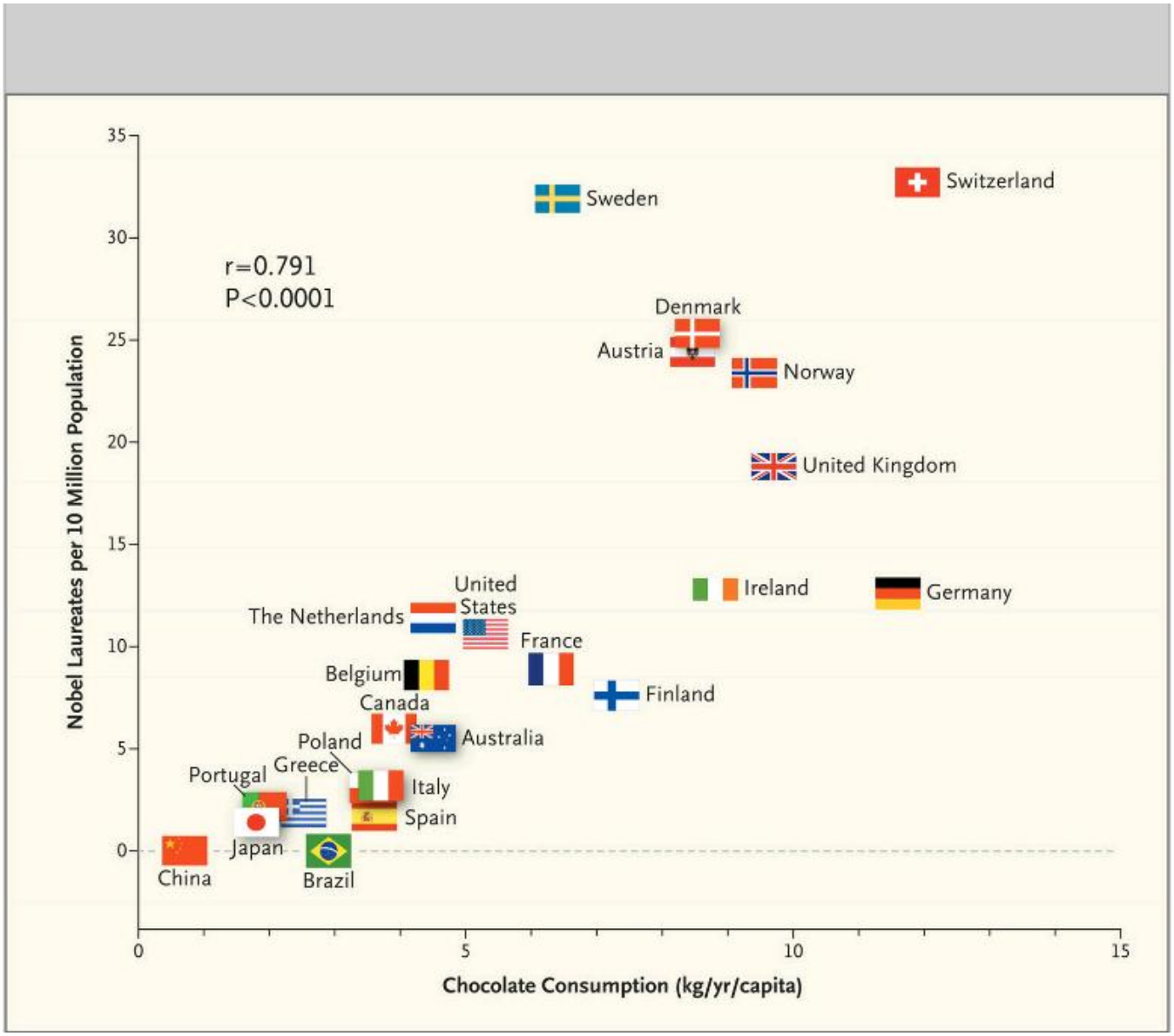
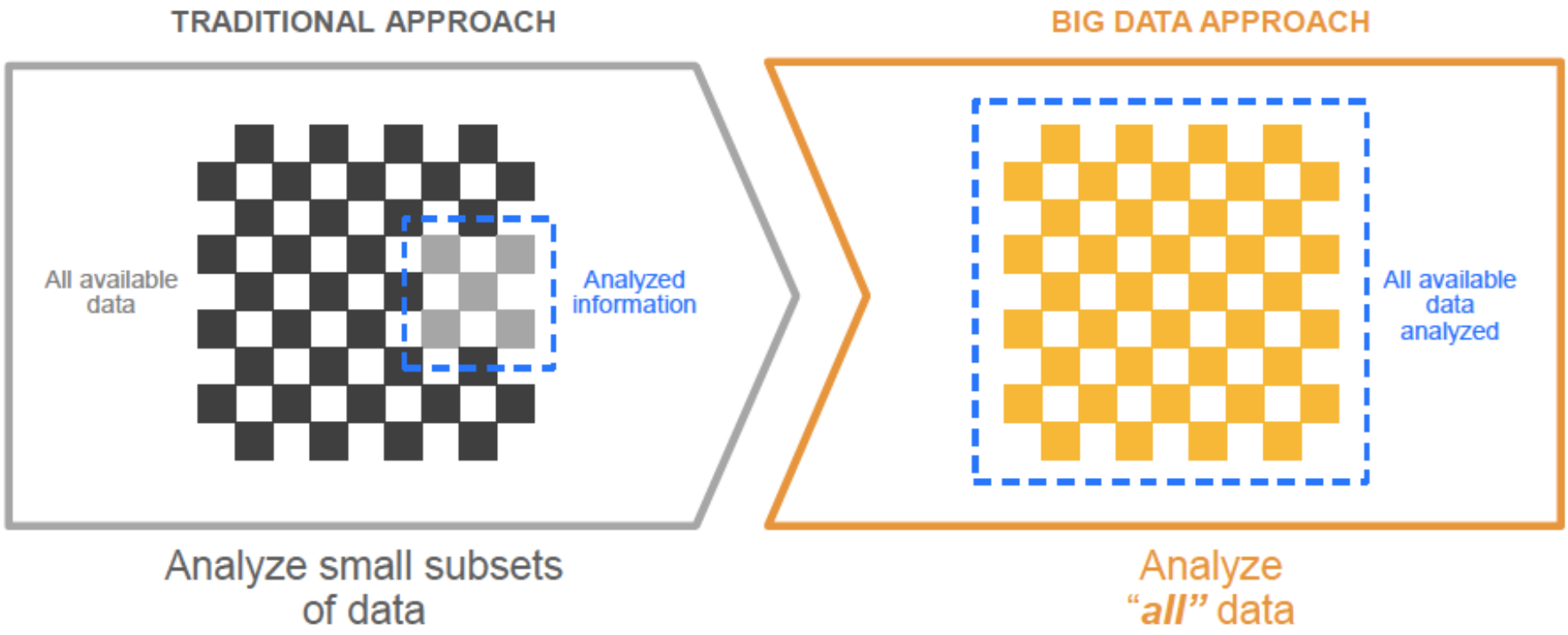
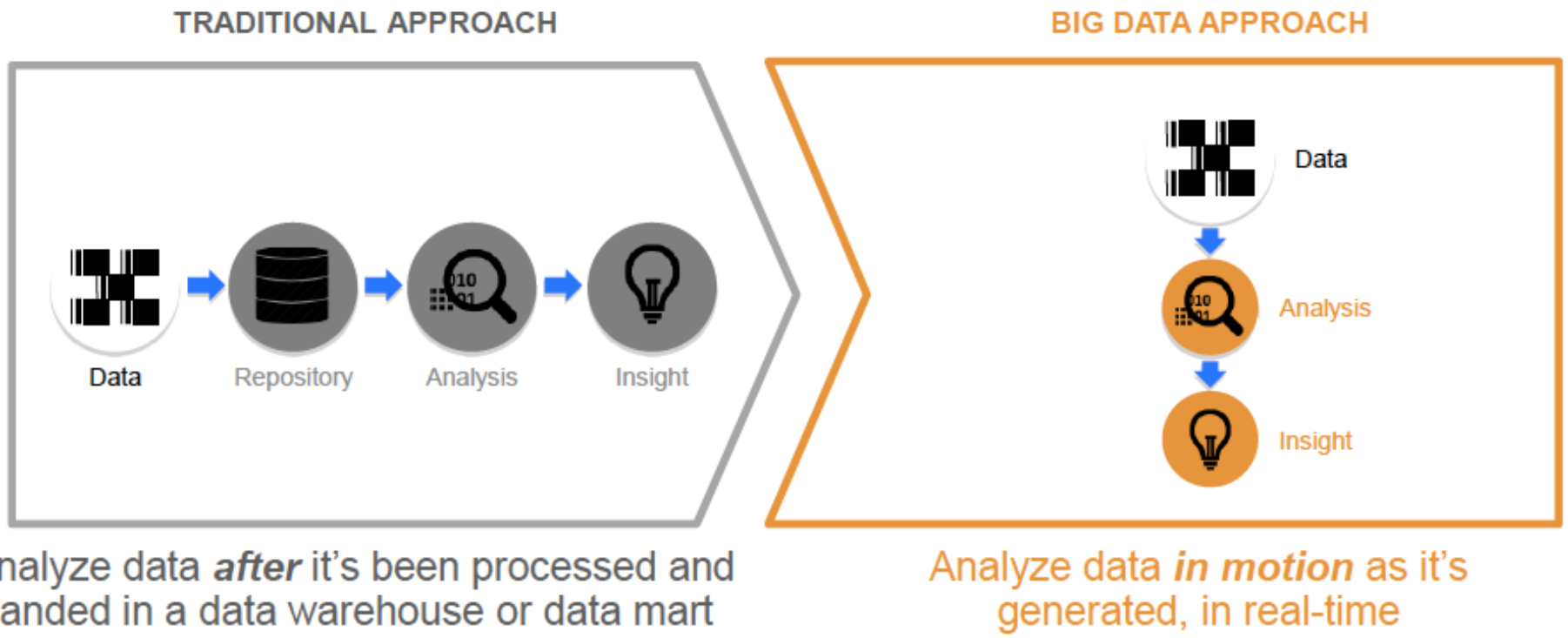


Figure 1. Correlation between Countries' Annual Per Capita Chocolate Consumption and the Number of Nobel Laureates per 10 Million Population.


TRADITIONAL APPROACH
All available data
Analyzed information
Analyze small subsets of data
BIG DATA APPROACH
All available data analyzed
Analyze "all" data


TRADITIONAL APPROACH
Data
Repository
Analysis
Insight
BIG DATA APPROACH
Data
Analysis
Insight
Analyze data *after* it's been processed and landed in a data warehouse or data mart
Analyze data *in motion* as it's generated, in real-time

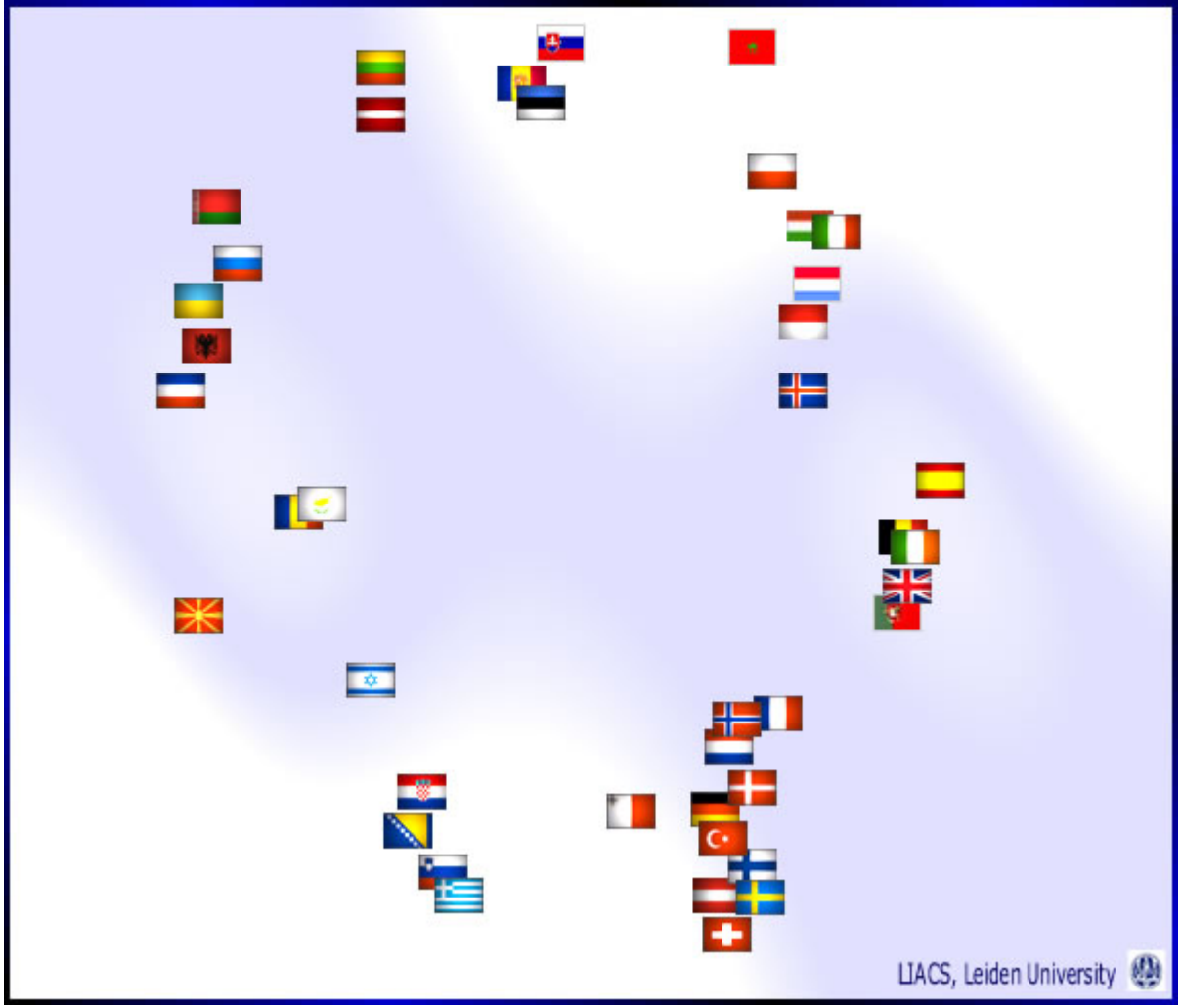
FRIENDS

TOP TEN

RANK	COUNTRIES	SCORE
1	Cyprus → Greece	10.89
2	Greece → Cyprus	10.06
3	Monaco → France	8.19
4	Hungary → United Kingdom	8.00
5	Romania → Russia	8.00
6	Finland → Estonia	7.71
7	Latvia → Estonia	7.67
8	FYR Macedonia → Croatia	7.60
9	Latvia → Russia	7.50
10	Russia → Romania	7.50

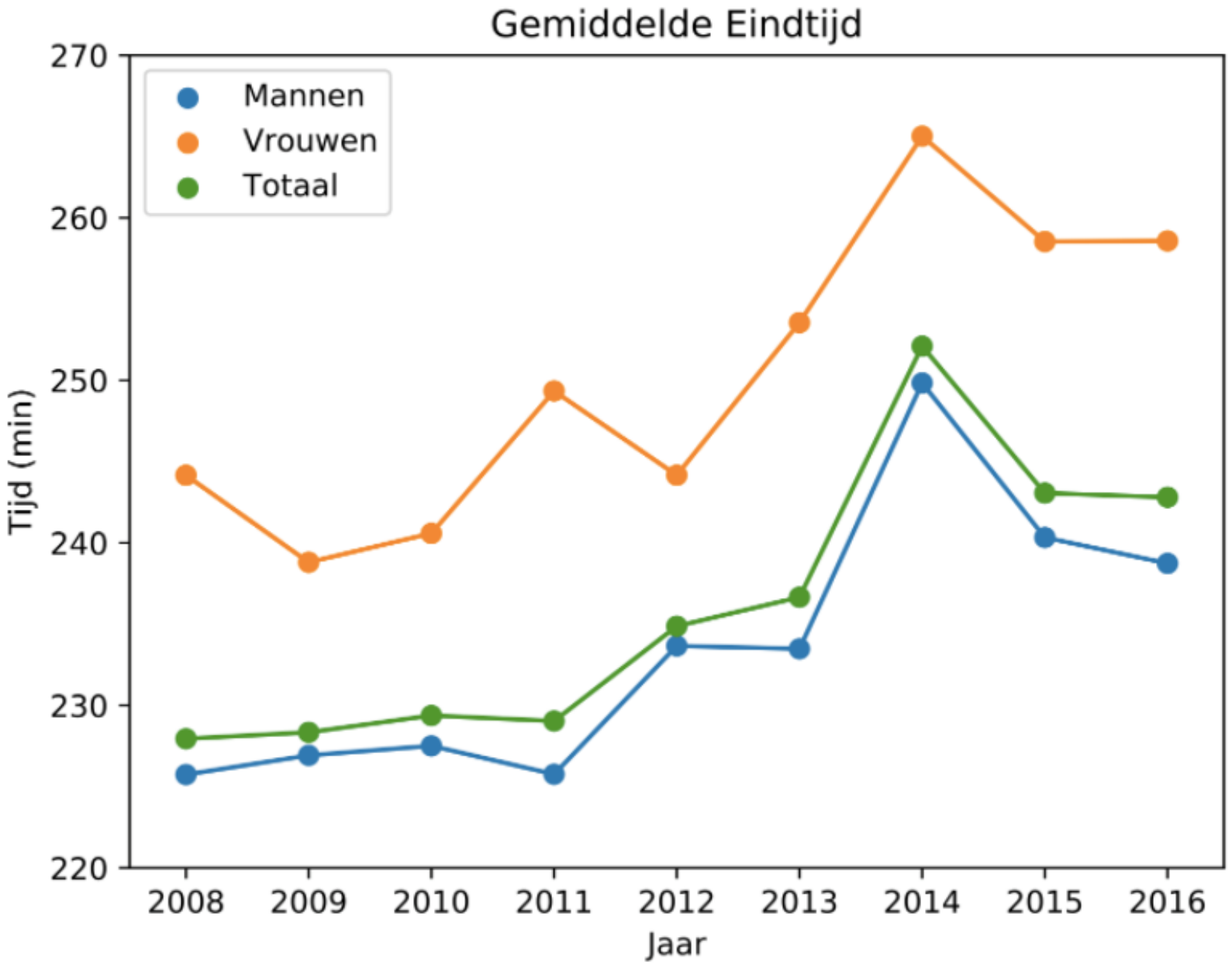
LIACS, Leiden University

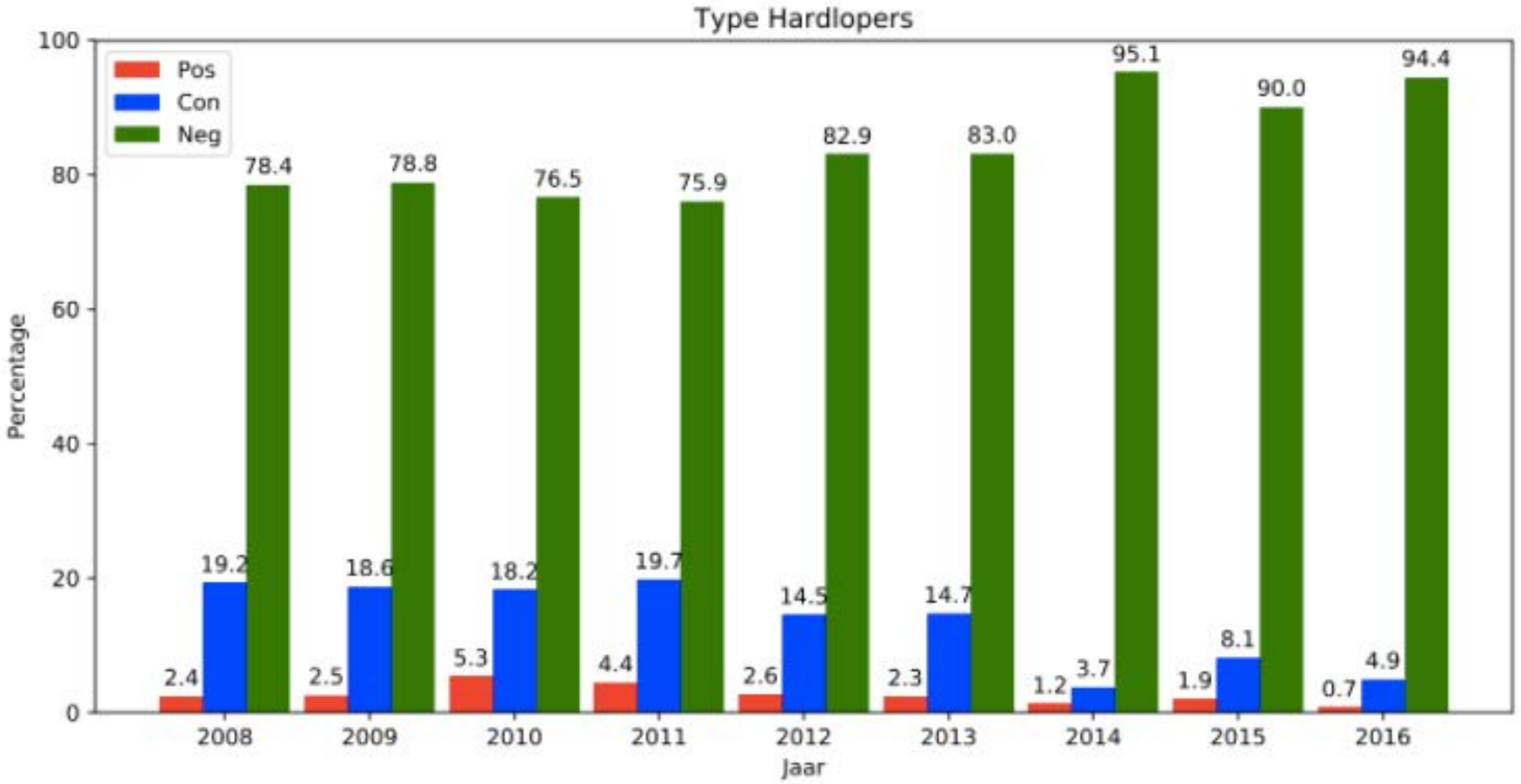
Country voting behaviour



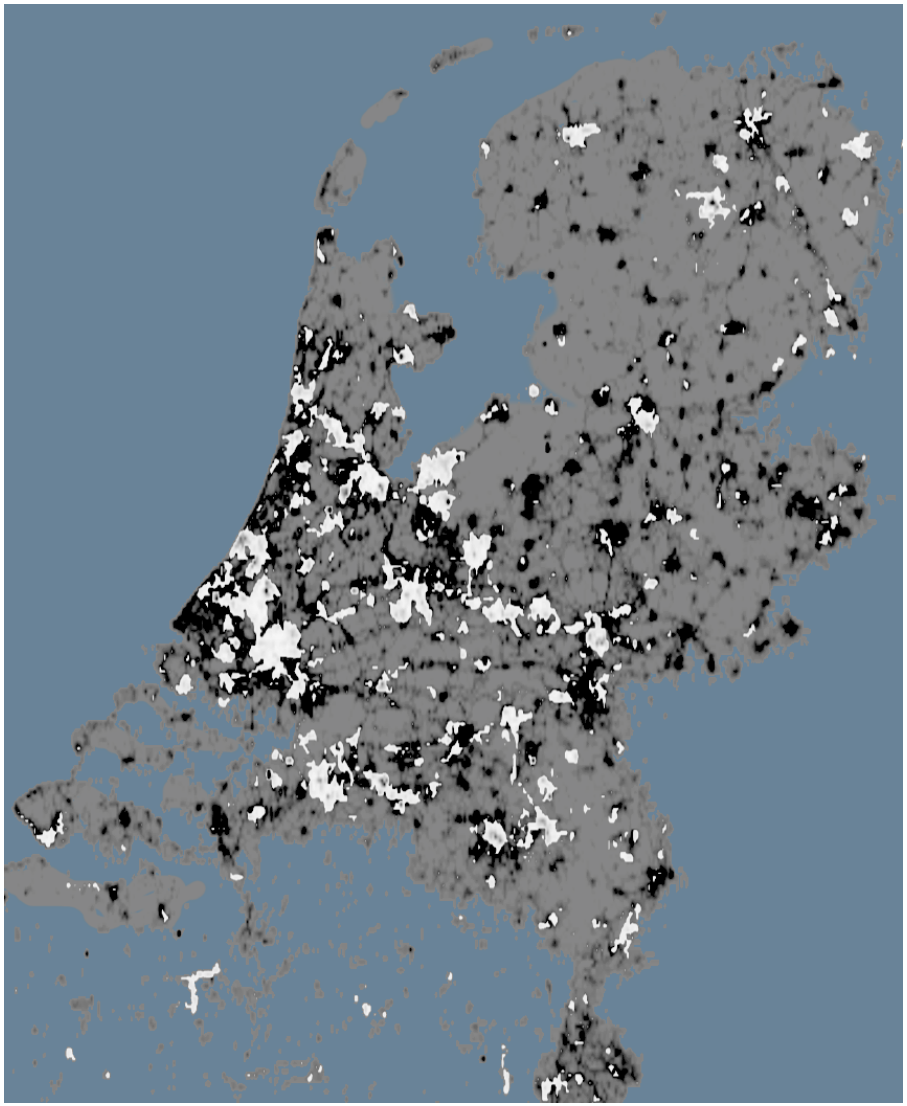
LIACS, Leiden University

MARATHO


Gemiddelde Eindtijd
Mannen
Vrouwen
Totaal
Tijd (min)
270
260
250
240
230
220
2008
2009
2010
2011
2012
2013
2014
2015
2016
Jaar



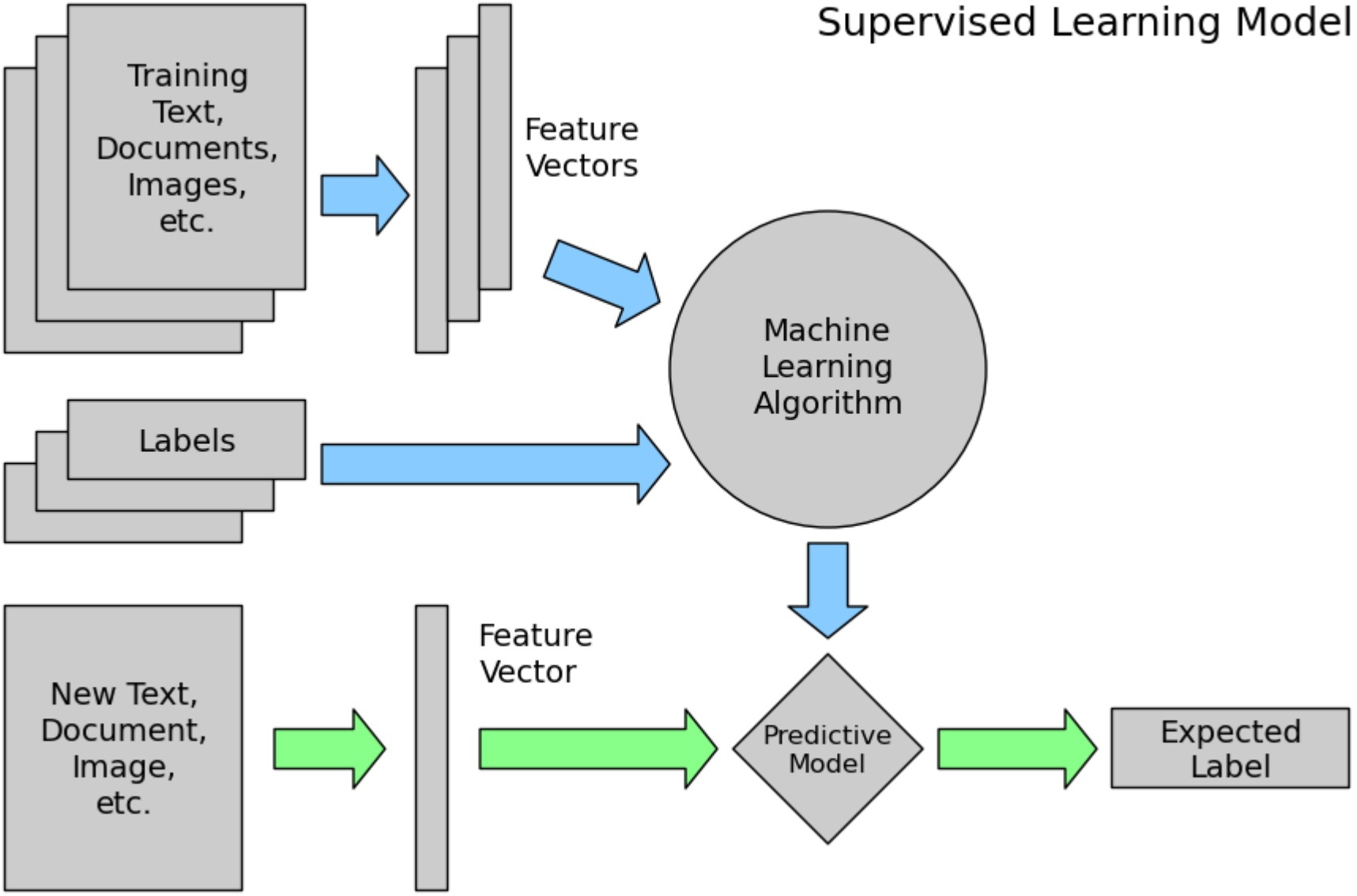
pos. : second part faster
con. : constant
neg. : first part faster



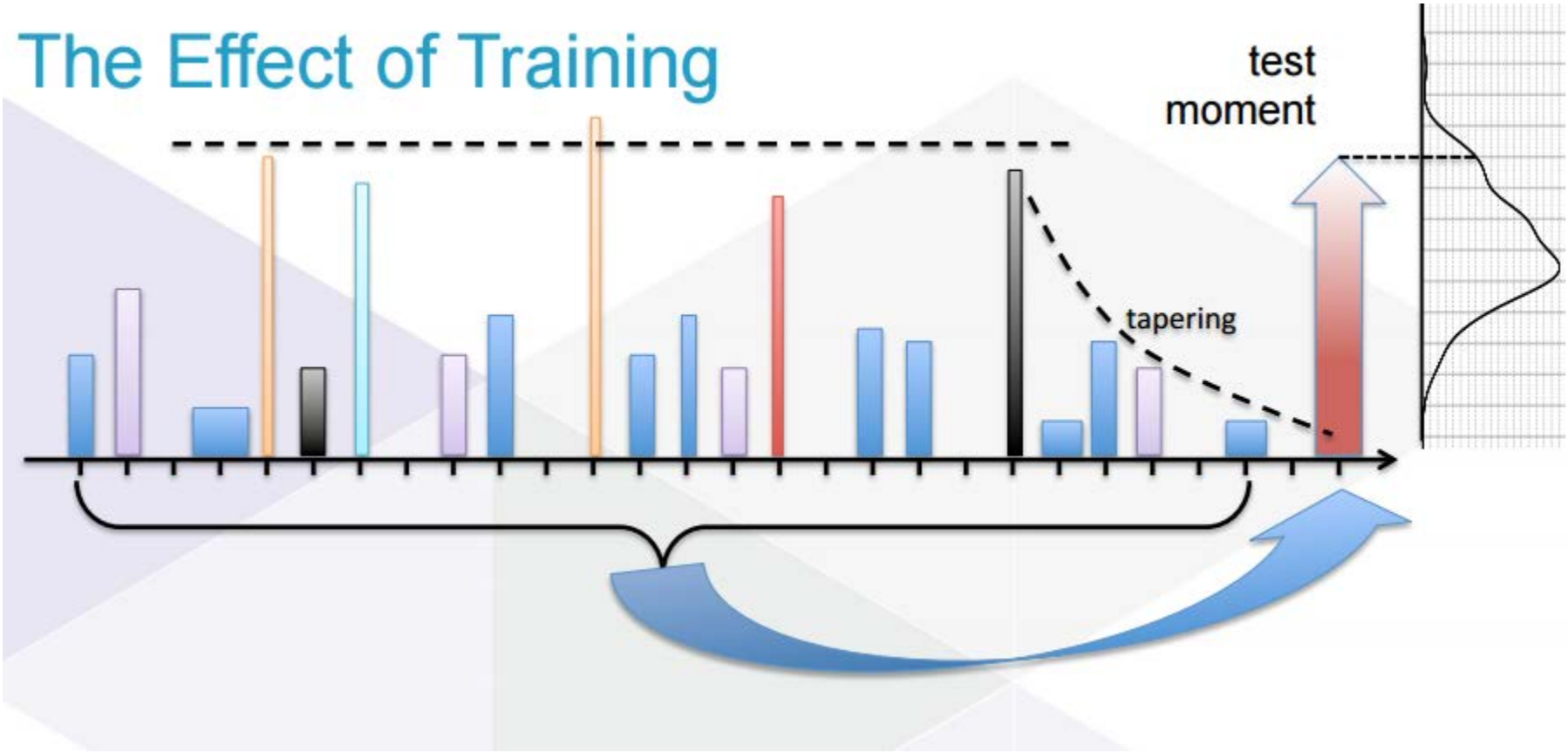
kpn
JUMBO
kpn
GRAND WORLD CUP
WINNER
WINNER

Lotto
Lotto.

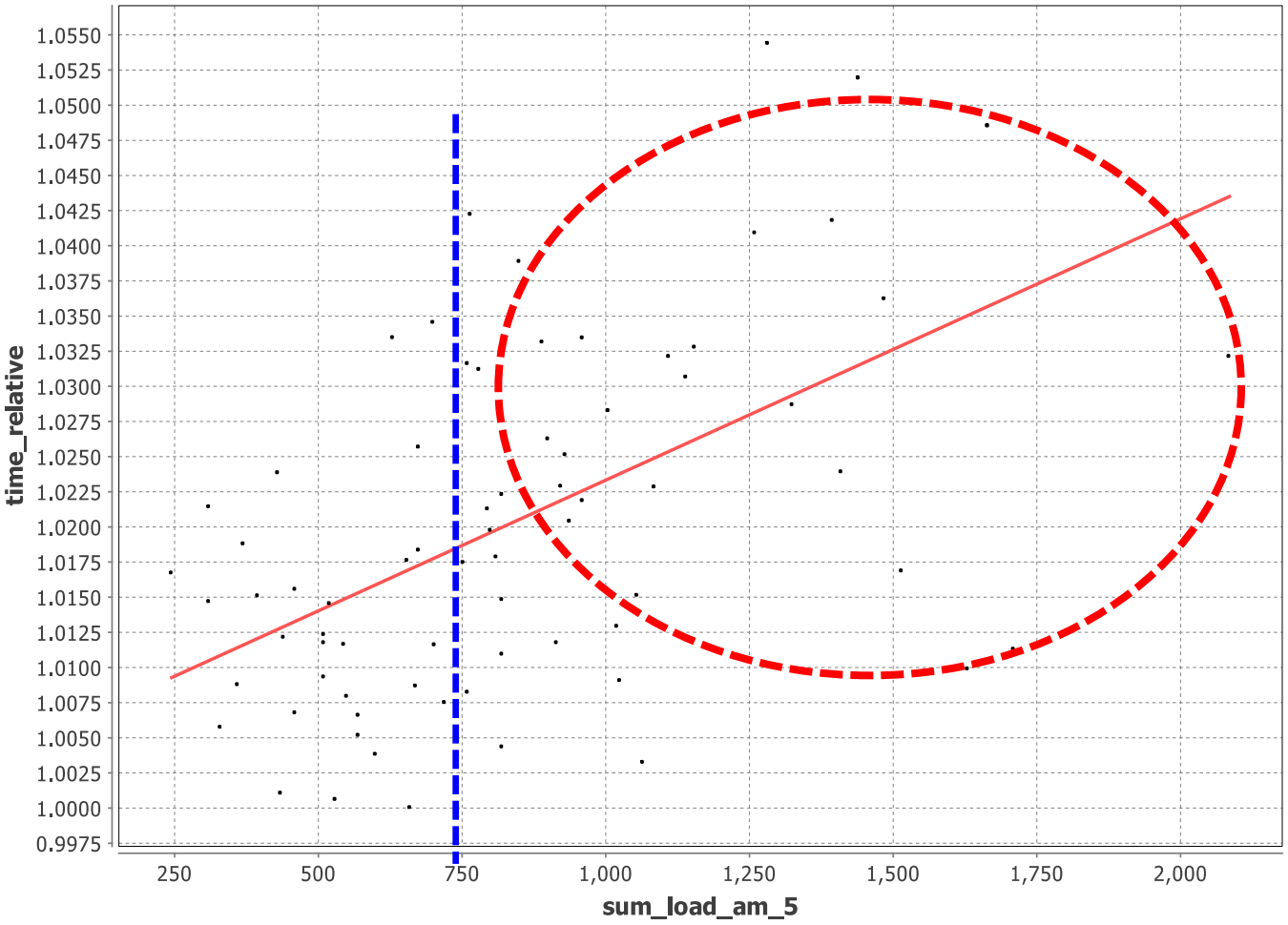
Speed Skating Dashboard


Supervised Learning Model
Training Text, Documents, Images, etc.
Feature Vectors
Machine Learning Algorithm
Labels
New Text, Document, Image, etc.
Feature Vector
Predictive Model
Expected Label

The Effect of Training



Sum of loads over last 5 days, morning sessions



Speed Skating Dashboard

Select

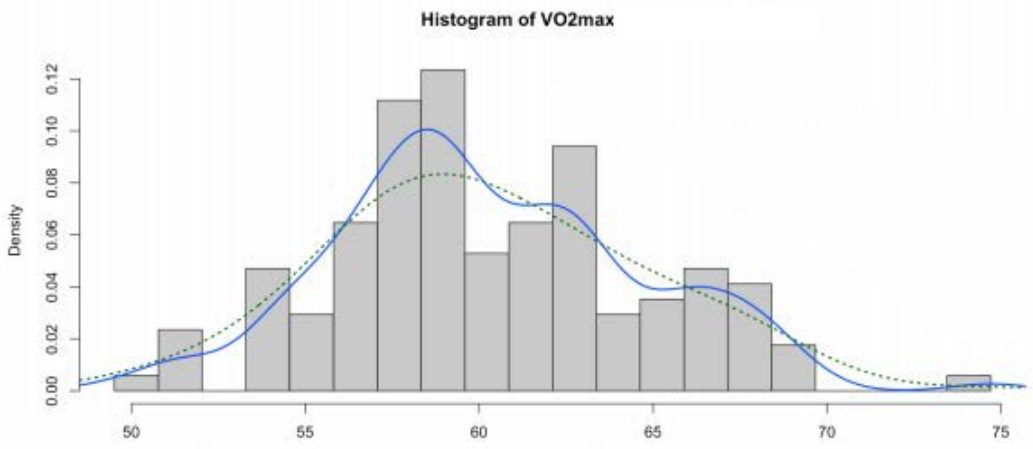
VO2 female max (ml/kg/min)

Number of bins:

1 20 50

Training | Competition | Wingate | Stappentest | Astrand

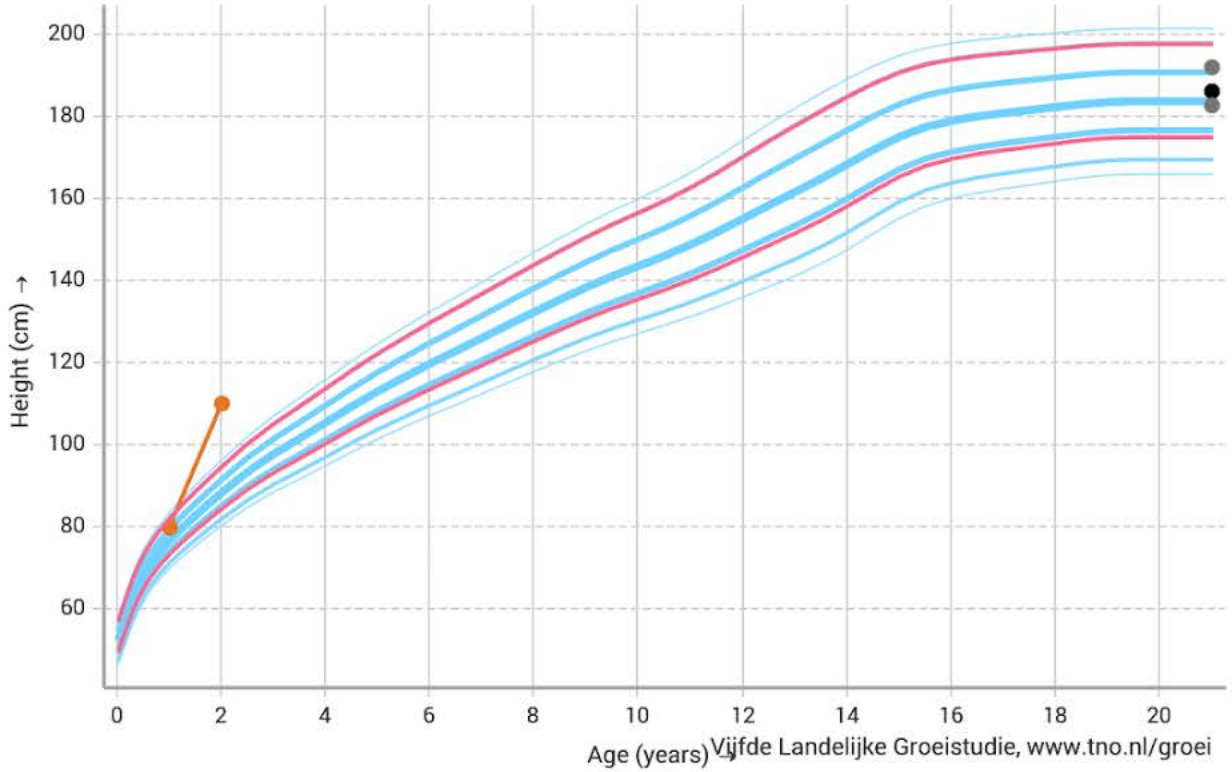
Evolution | Distribution | Data | Insert



John

Delete

From 0 to 21 years | Recommended area: Choose...



Record details

Growth references	Netherlands
Gender	Boy
Date of birth	9-17-2013
Gestational age	40 wks 2 days
Height of father	183 cm (-0.14 SDS, P44.6)
Height of mother	178 cm (1.15 SDS, P87.4)
Target height	186.47 cm (0.37 SDS, P64.5)

Measurements

9-17-2015 (2.000 yrs)
110 cm / 23 kg / BMI: 19.0

9-17-2014 (1.000 yrs)
80 cm / 10 kg / 49 cm / BMI: 15.6

Growth Analyser

Rating

Tournament

Strength of Tournament

Home Advantage

Team

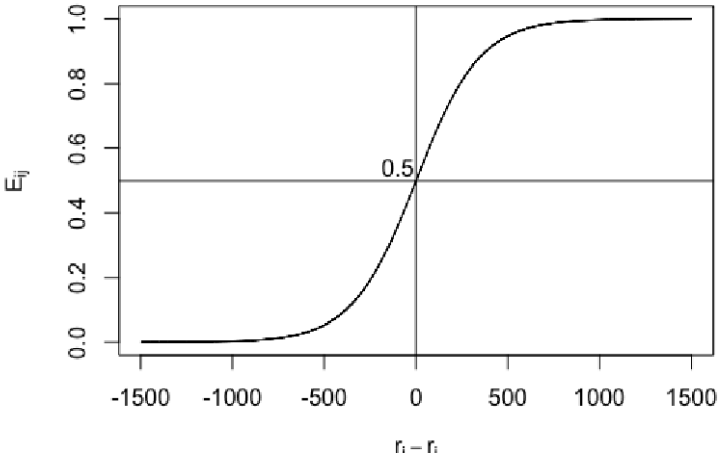
Prediction

Player Rating

Match Importance	K-value
FIFA Women's World Cup match	60
Women's Olympic football tournament	60
FIFA Women's World Cup qualifier	45
Women's Olympic football qualifier	45
Women's Continental finals match	45
Women's Continental qualifier	30
Women's friendly match between two Top 10 teams	30
Women's friendly match	15

Team	FIFA women's rating before the tournament	Ranking
Germany	2111	2
France	2076	3
England	2024	5
Sweden	1956	9
Norway	1924	11
Netherlands	1918	12
Spain	1885	13
Denmark	1872	15
Switzerland	1858	17
Italy	1841	18
Iceland	1829	19
Scotland	1788	21
Belgium	1756	22
Austria	1746	24
Russia	1738	25
Portugal	1590	38

$$S_{ij} = \begin{cases} 1 & if\ i\ wins\ over\ j, \\ 1/2 & if\ i\ and\ j\ draw\ a\ tie, \\ 0 & if\ i\ loses\ to\ j. \end{cases}$$



$$PSE(i,j) = \sum_{m=1}^{M} (S_{ijm} - E_{ijm})^2 + (S_{jim} - E_{jim})^2$$

$$E_h = \frac{1}{1 + 10^{-(h + r_h - r_a)/400}}$$

SPORT DATA CENTER | MAP | ATHLETES | COUNTRIES | PREDICTIONS | ABOUT

Choose discipline(s):

Horizontal Bar Men

Choose Athlete(s):

Epke Zonderland

- Emre Arabacioglu
- Endriadi
- Enkhmunkh Munkhjargal
- Enrico Pozzo
- Enrique Navarro
- Enzo Bernardoni
- Epke Zonderland

Rating History | Rating by Date | Age | potential winners | athletes overview | Info | About

Personal information for Epke Zonderland

Name: Epke Zonderland

Discipline: Horizontal Bar

Category: Men

Age: 29.5

Country: Netherlands

ELO: 1651.31

Rank: 2

SPORT DATA CENTER | MAP | ATHLETES | COUNTRIES | PREDICTIONS | ABOUT

Choose discipline:

Horizontal Bar Men

Top Athletes Now

How many:

None | 3 | 5 | 10

Top Athletes Ever

How many:

None | 3 | 5 | 10

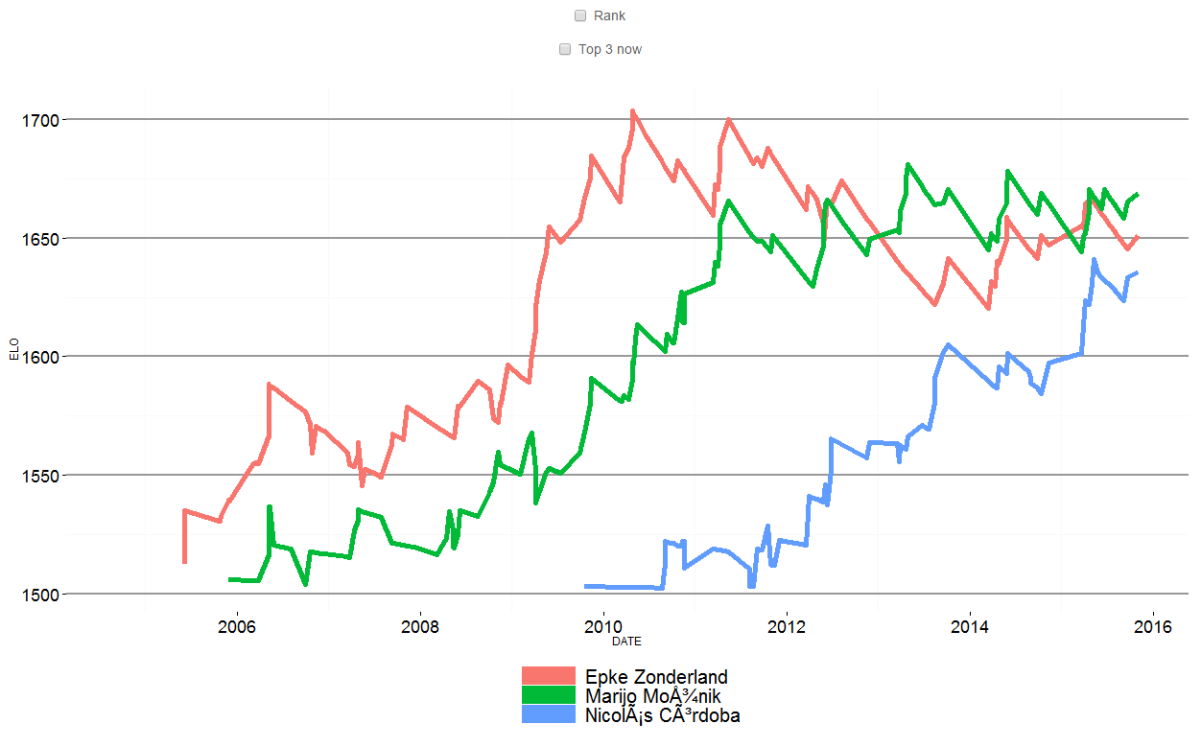
Other Athletes

Choose Athlete(s):

Please pick one or more athletes

- Adam Rzepa
- Adam Wong
- Adan Santos
- Adelin Kotrong
- Adham Al-Sqour
- Adickxon Trejo
- Aditya Rana

Rating History | Rating by Date | Age | potential winners | athletes overview | Info | About



Home > News > Data analysis is really helping the Dutch national women's football team

Data analysis is really helping the Dutch national women's football team

10 July 2017

The European Football Championship for Women, in the Netherlands this summer, is the background for a large and innovative data research project. The Dutch football union is working together with Leiden University and Sportinnovator. The research is expected to uncover links that have thus far remained hidden.

Optimise the game

To be able to perform optimally in top sport calls for optimal conditions. In the past, good shoes and a decent ball were enough, but today help comes from super computers. Scientists at Leiden University's Sport Data Center know how to use the data to optimise the game. A large data study is expected to give new insights.

•BallJames – How (1/2)

Video footage from 14 camera's flows via a smart and fast internal network to the cloud, where it is processed and transformed to customized data and insights

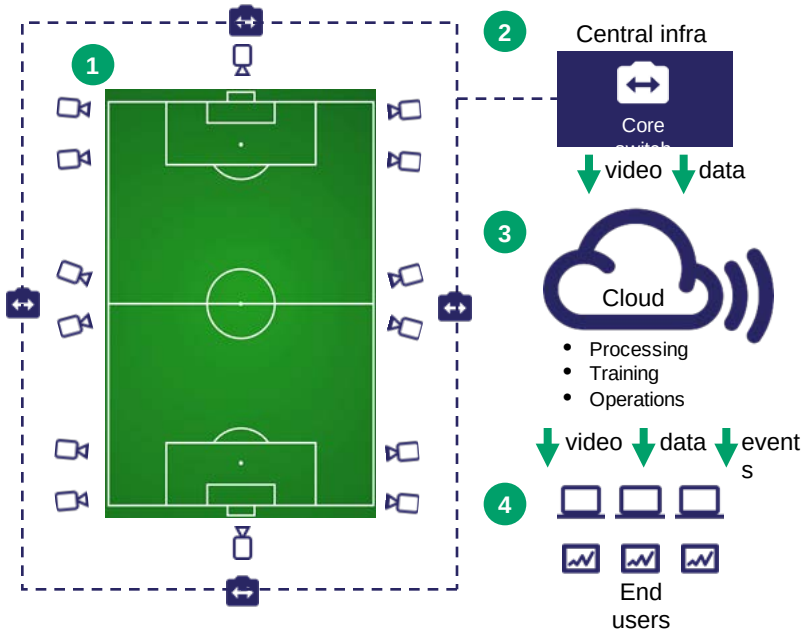
Main elements

Stadium

1. Camera installation
   - 14 camera's with pitch view
   - Recording, encoding and storing video
   - Connected and powered over ethernet
2. Network installation
   - 4 edge switches that merge 1 to 6 video data streams
   - 1 core server that connects internal network to external network and cloud

Cloud

3. BallJames platform
   - Processing cloud with GPU's and CPU's to detect and track players and ball
   - Training cloud to incrementally retrain our deep-learning models
   - Operations cloud where internal administration, scheduling and maintenance is run
4. End user front-end
   - API for direct access to Live Stream data
   - Portal for after-match downloads, insights and much more



UEFA
WOMEN'S
EURO 2017
THE NETHERLANDS
TM

WOMEN'S EURO 2017

SHOWCASE FOR SPORT DATA VALLEY

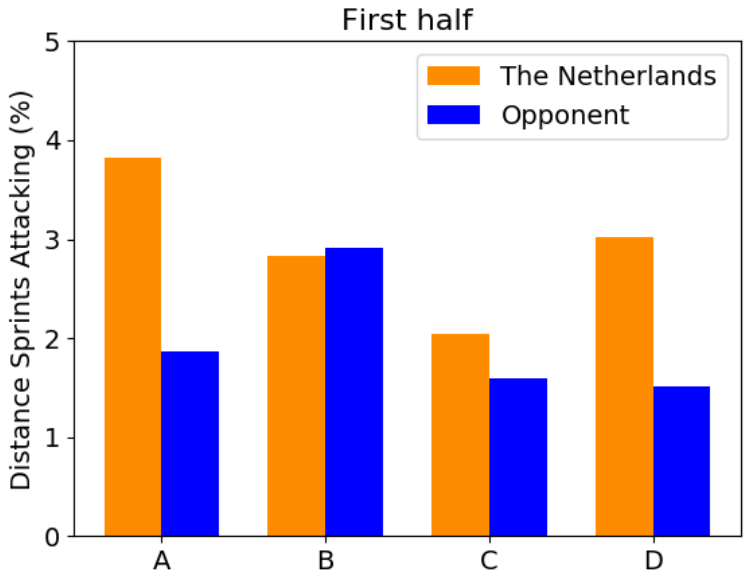
- Cooperation between KNVB, Sportinnovator & Sport Data Center.
- Use WEURO to collect data and add value to the data
- Knowledge institutions & Companies
- Data available in the Sport Data Valley

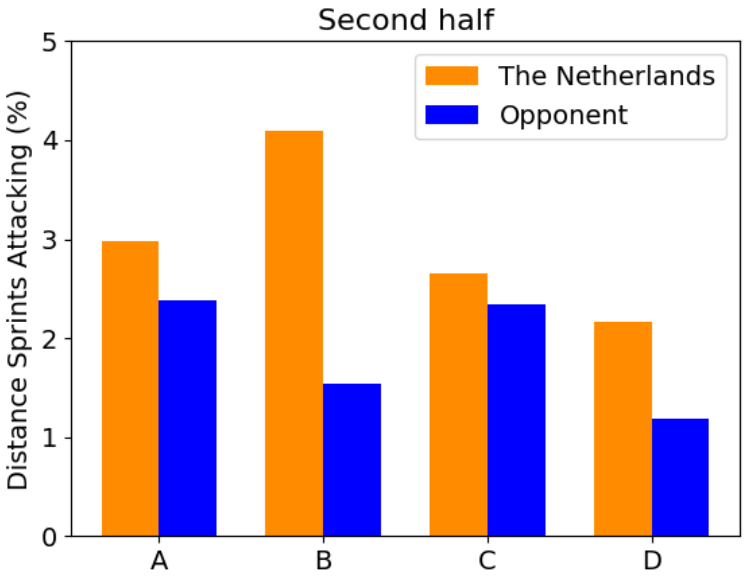
PERFORMANCE ANALYSIS DASHBOARD

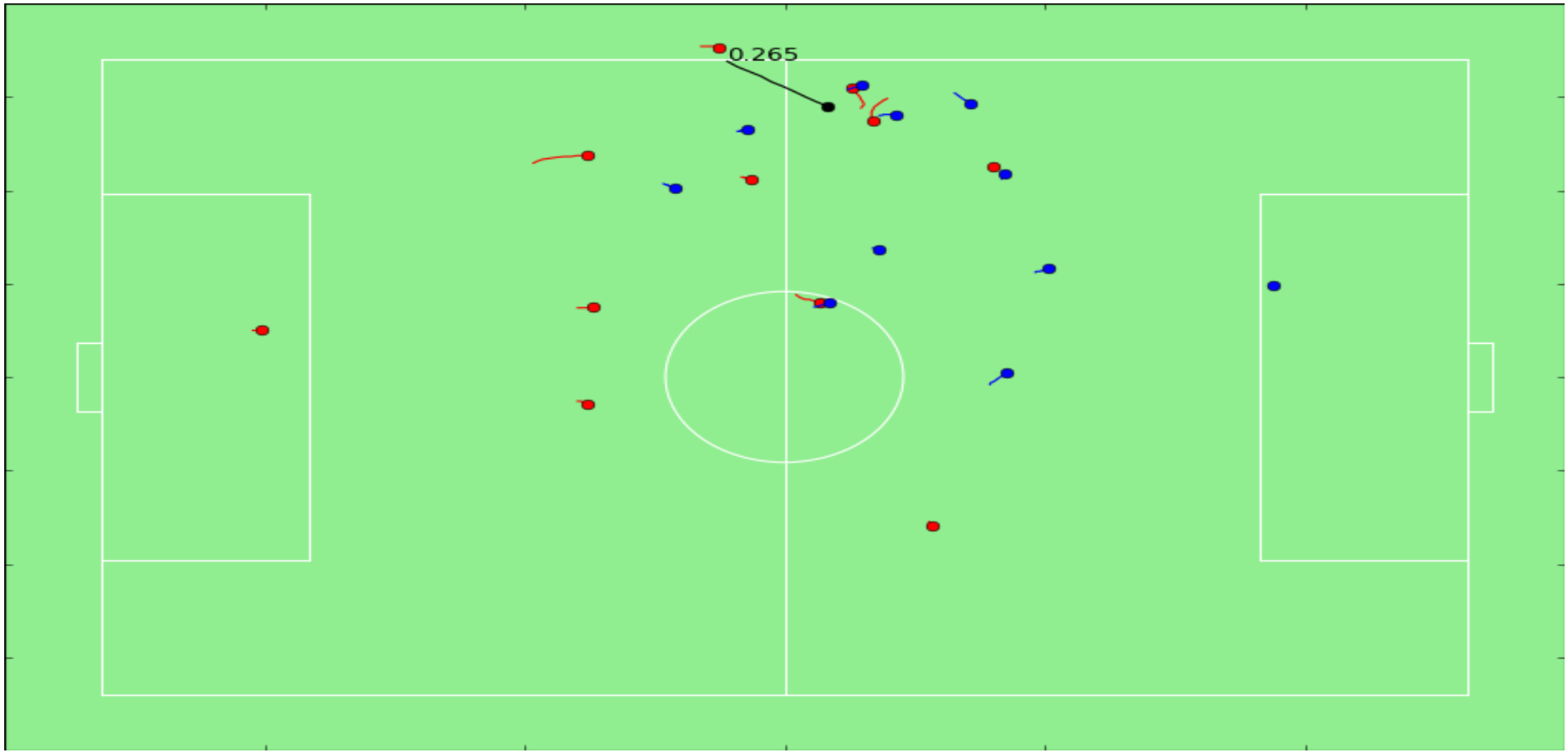
HTTPS://FFBPAD.APPSPOT.COM/ HTTPS://TINYURL.COM/SOCCERLAB

SPRINTS

ATTACKING: DISTANCE > 24 KM/H



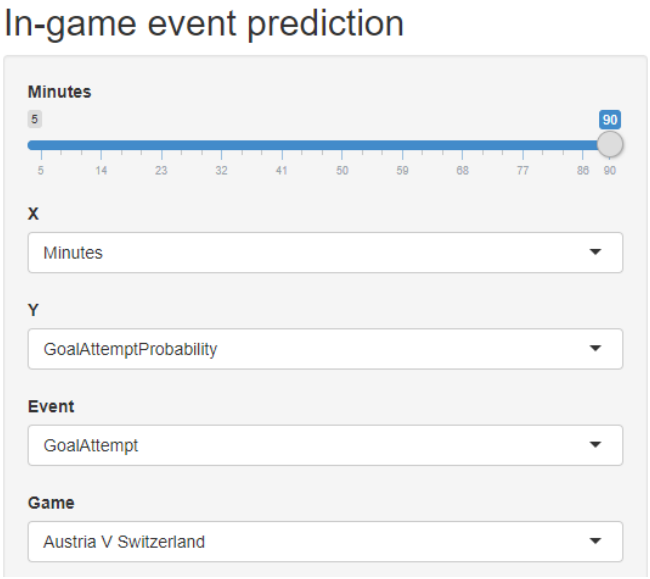


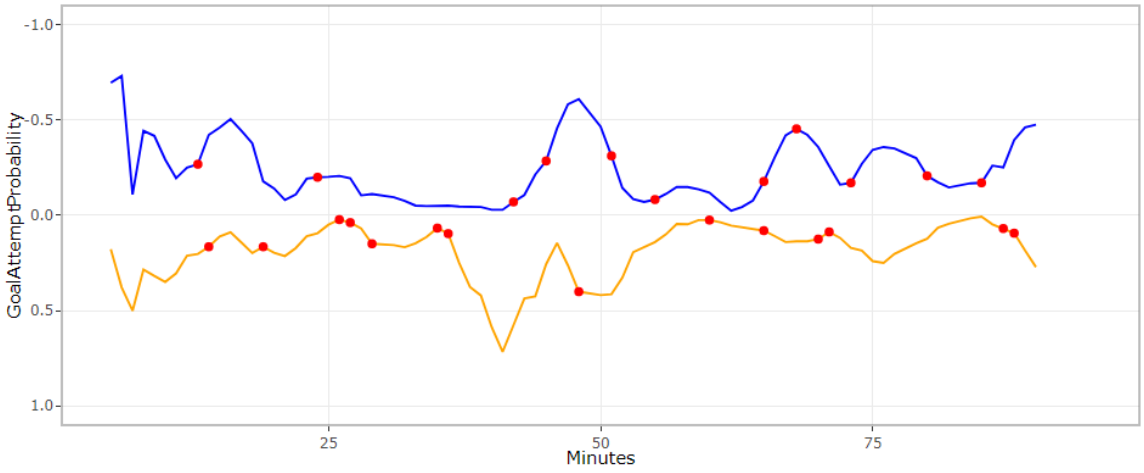


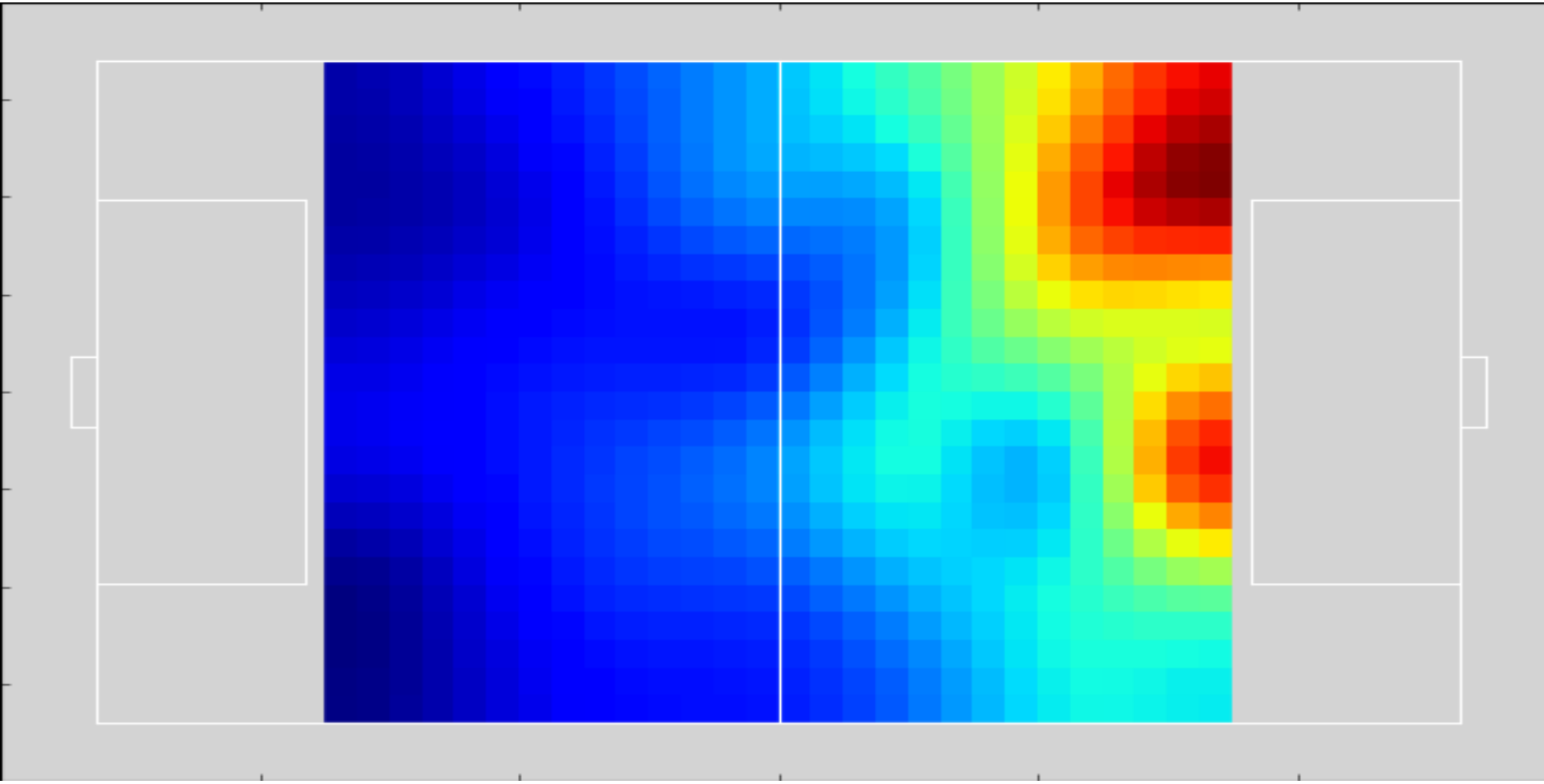
LEUPHANA
UNIVERSITÄT LÜNEBURG

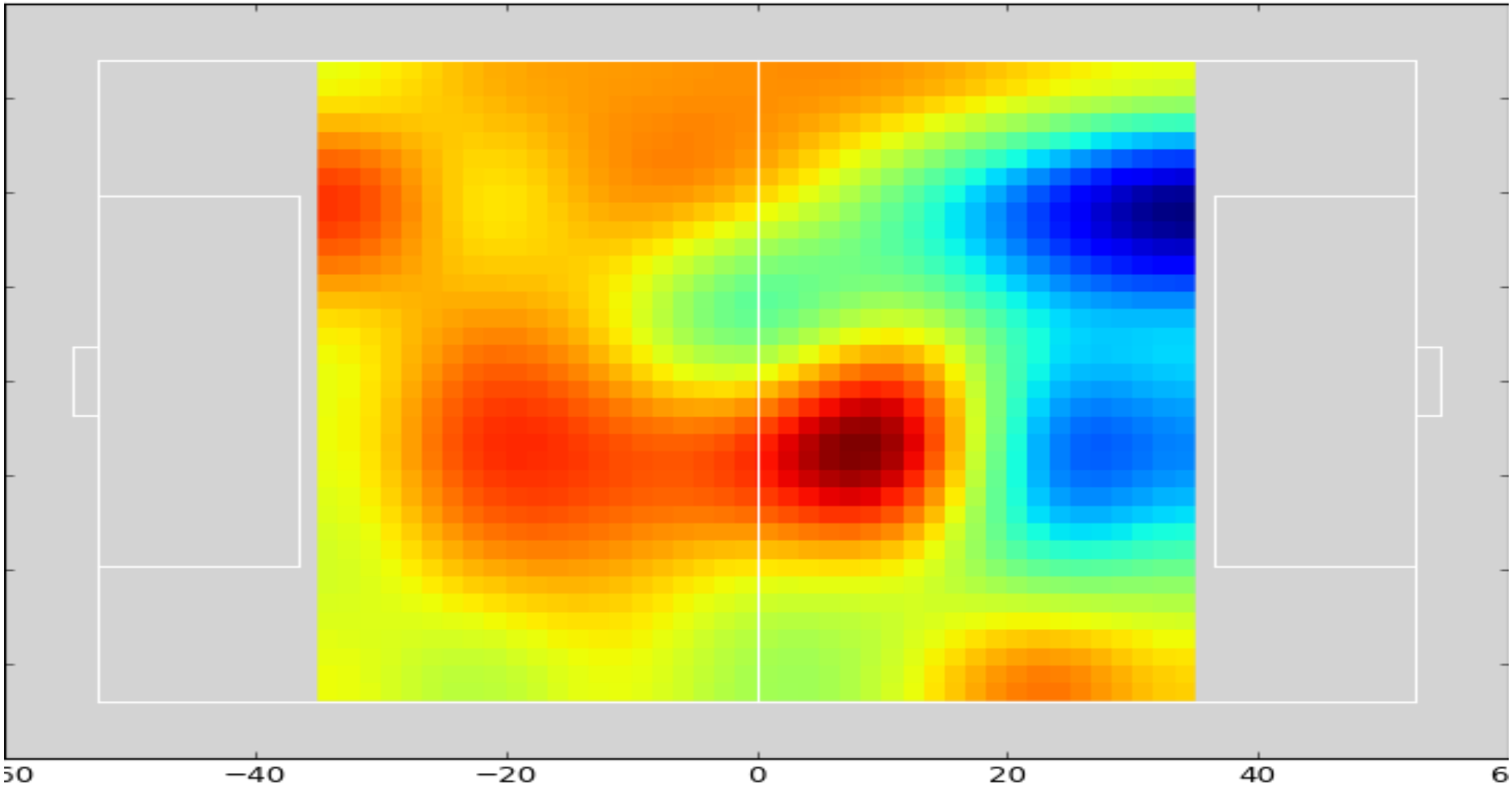
EVENT PREDICTION

IN-GAME, NEAR REAL-TIME





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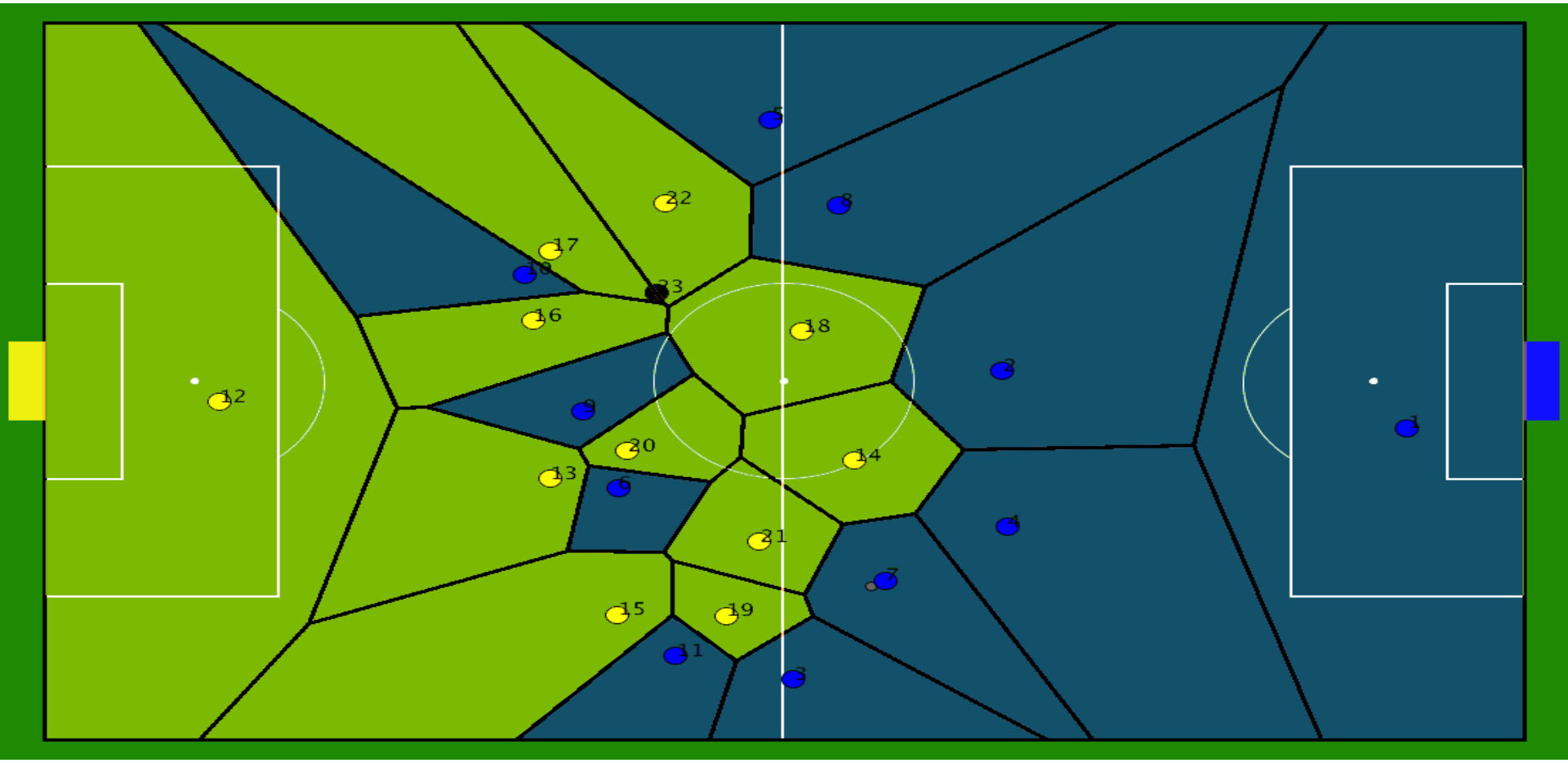
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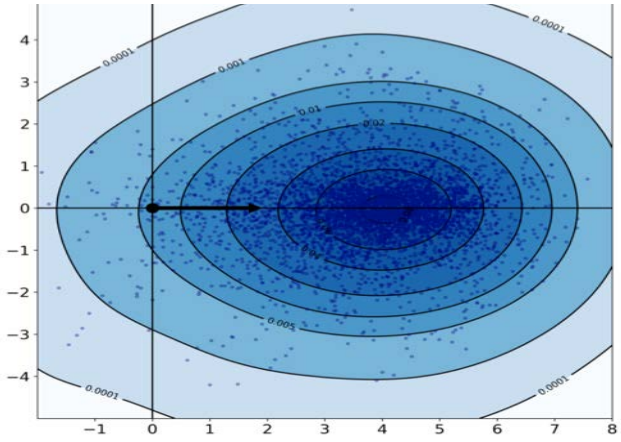
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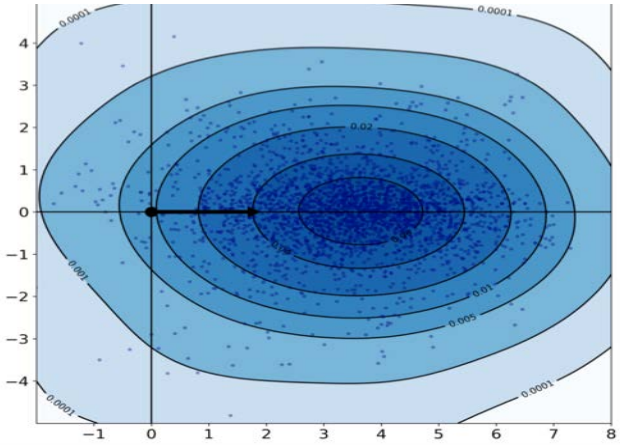
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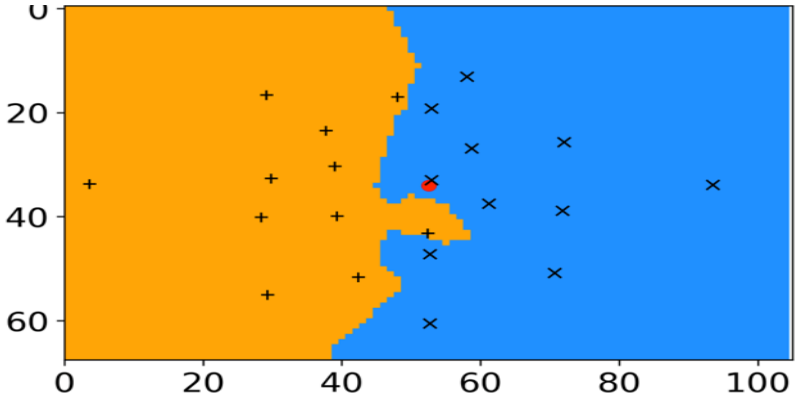
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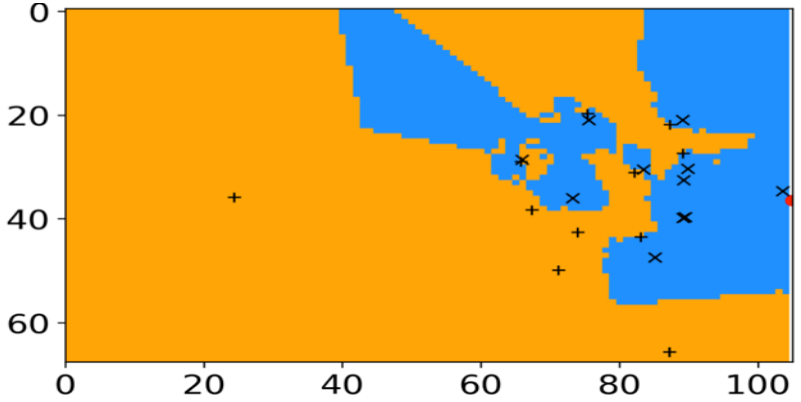
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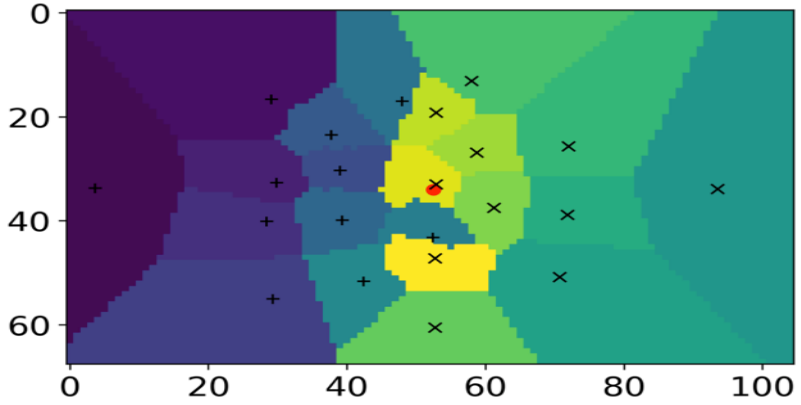
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https://www.sportinnovator.nl/sport-data-valley/