

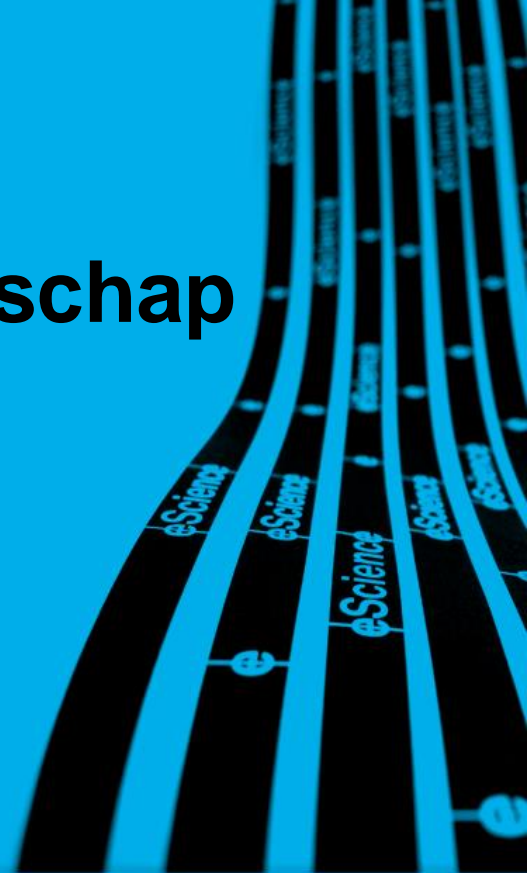
Data-gedreven wetenschap

Wilco Hazeleger

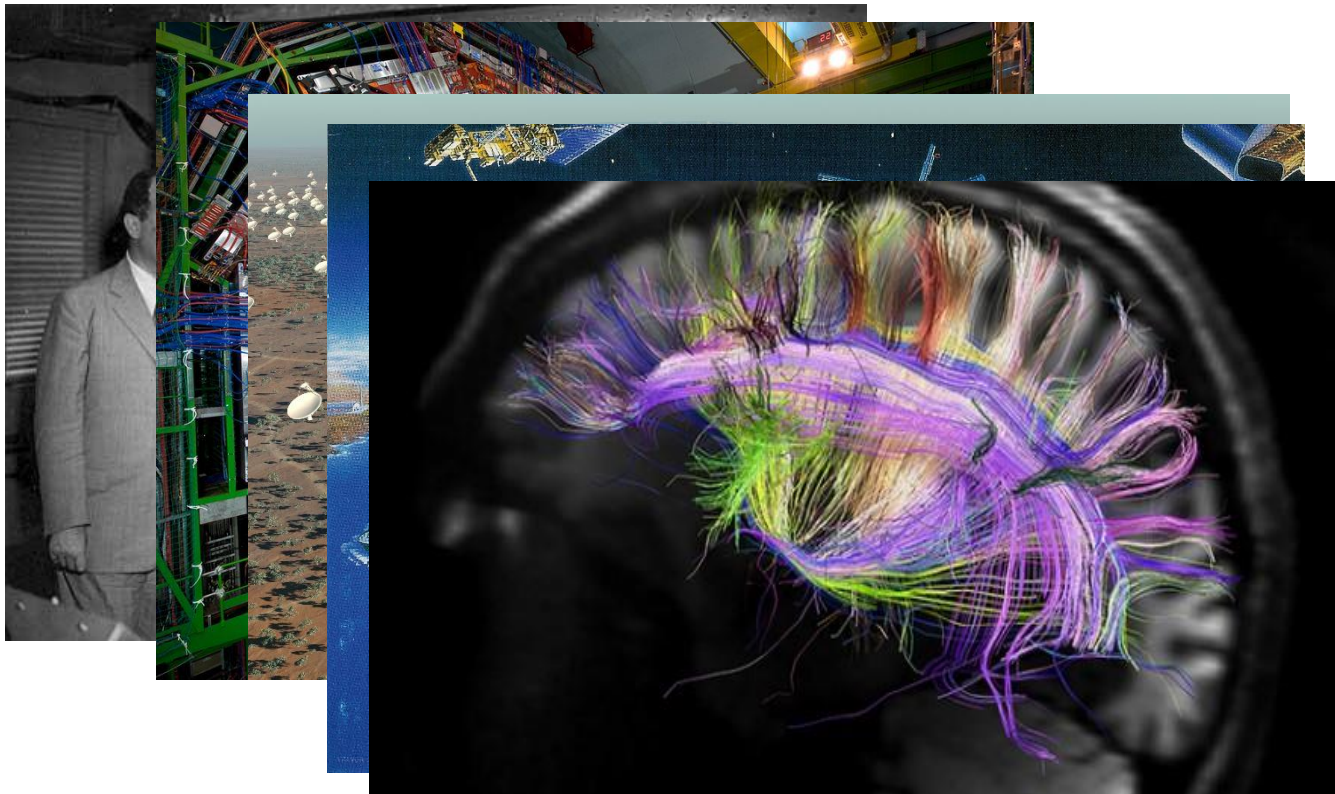
netherlands

eScience center

by SURF & NWO



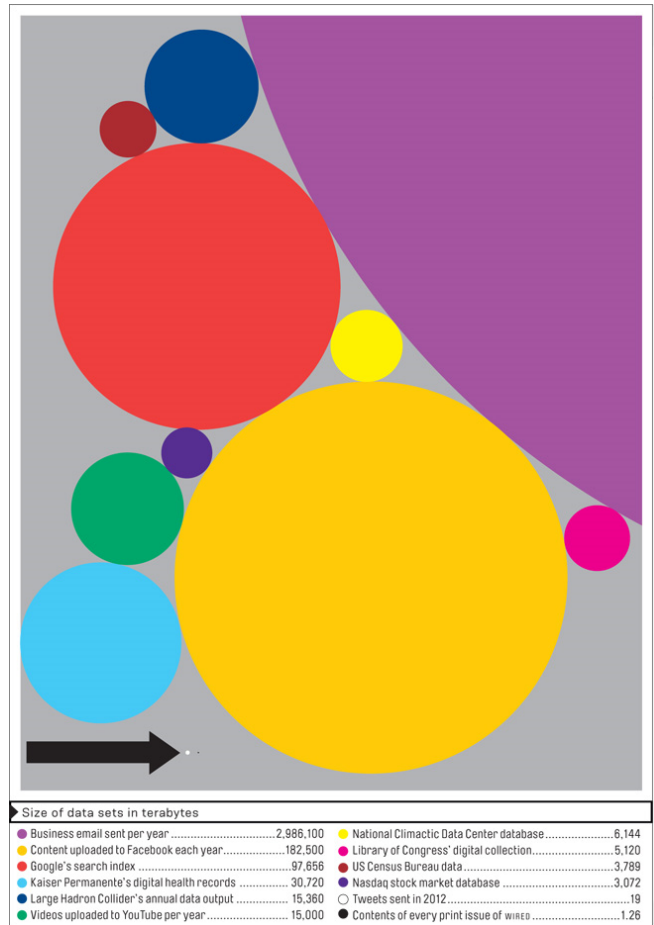
Het 'Big Science' tijdperk



Big Data

Consequence of Our Digital World

- Internet
- Social Media
- Supercomputing
- Digitised Text
- Security cameras
- Laboratory informatics
- Parallelization of experiments
- Sensor network
 - Radio telescopes
 - Ocean sensors
 - Satellites
 - Your digital camera



Het vierde paradigma: Data-Intensive Scientific Discovery

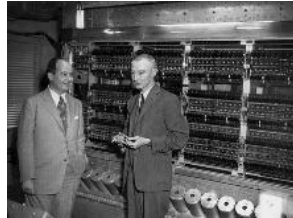
Theorie
Experiment

1st & 2nd



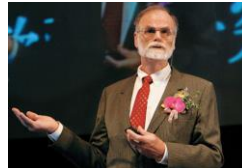
Simulatie

3rd
1940's -



Data-Intensief

4th
2000's -



WIRED MAGAZINE: 16.07

SCIENCE : DISCOVERIES

The End of Theory: The Data Deluge Makes the Scientific Method Obsolete

By Chris Anderson 06.23.08

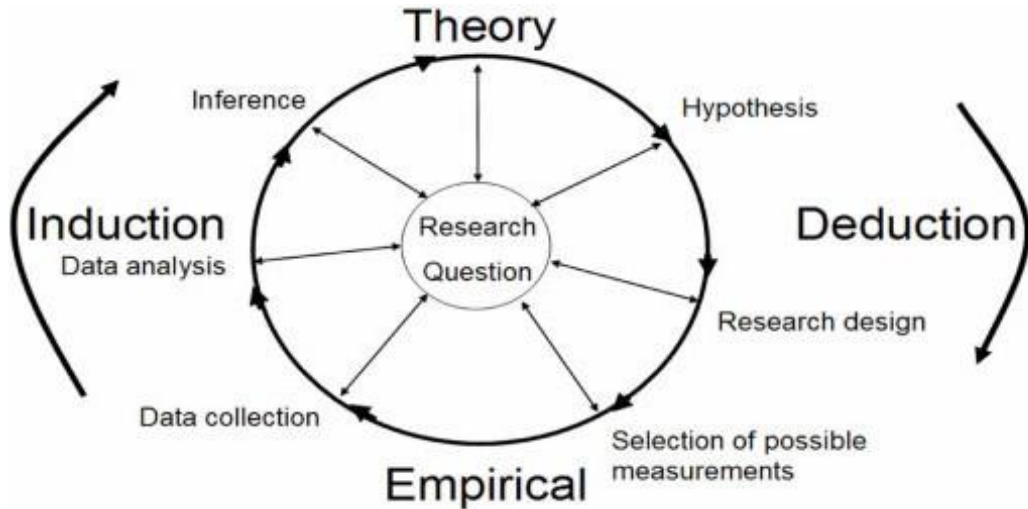


Illustration: Marian Banjes

THE PETABYTE AGE:

"All models are wrong, but some are useful."





Grote uitdagingen van nu

- **‘Big science’ gedreven door ‘big societal’ uitdagingen**
 - Multi- inter-, transdisciplinair onderzoek (*bijv. circulaire economie, gezondheid, duurzaamheid*)
 - Bijna altijd een grote ICT of data component
- **Wetenschap zelf ‘big’ en complex**
 - Big data, computing, analytics
 - Interacties tussen systemen en schalen (tijd, ruimte)



Netherlands eScience Center advanced ICT, computer, data science



research

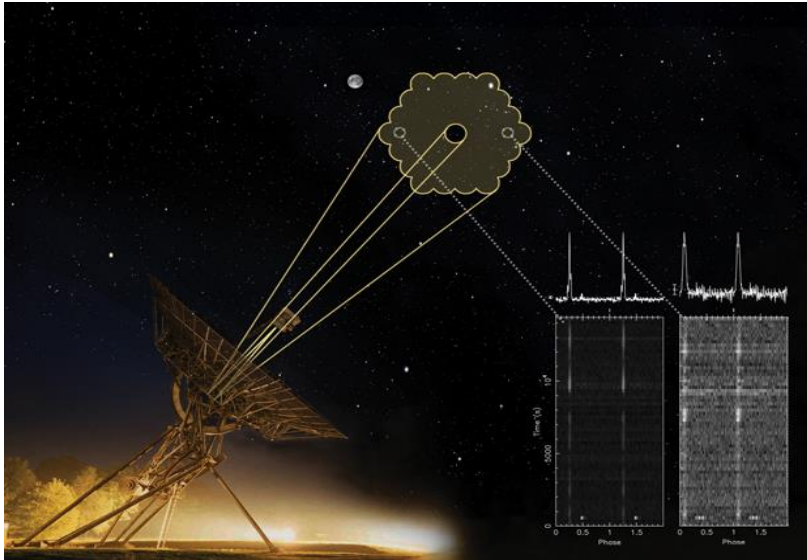


Hoe wij werken

- **eScience Research Engineers**
- **Projecten samen met academia en instituten ('in cash' en 'in kind')**
- **Publiek private samenwerking**
- **Overkoepelend *eScience Technology Platform*, *eSTeP* (software, open access, kennisbasis, training)**



'Big data' voor de 'Big Bang'

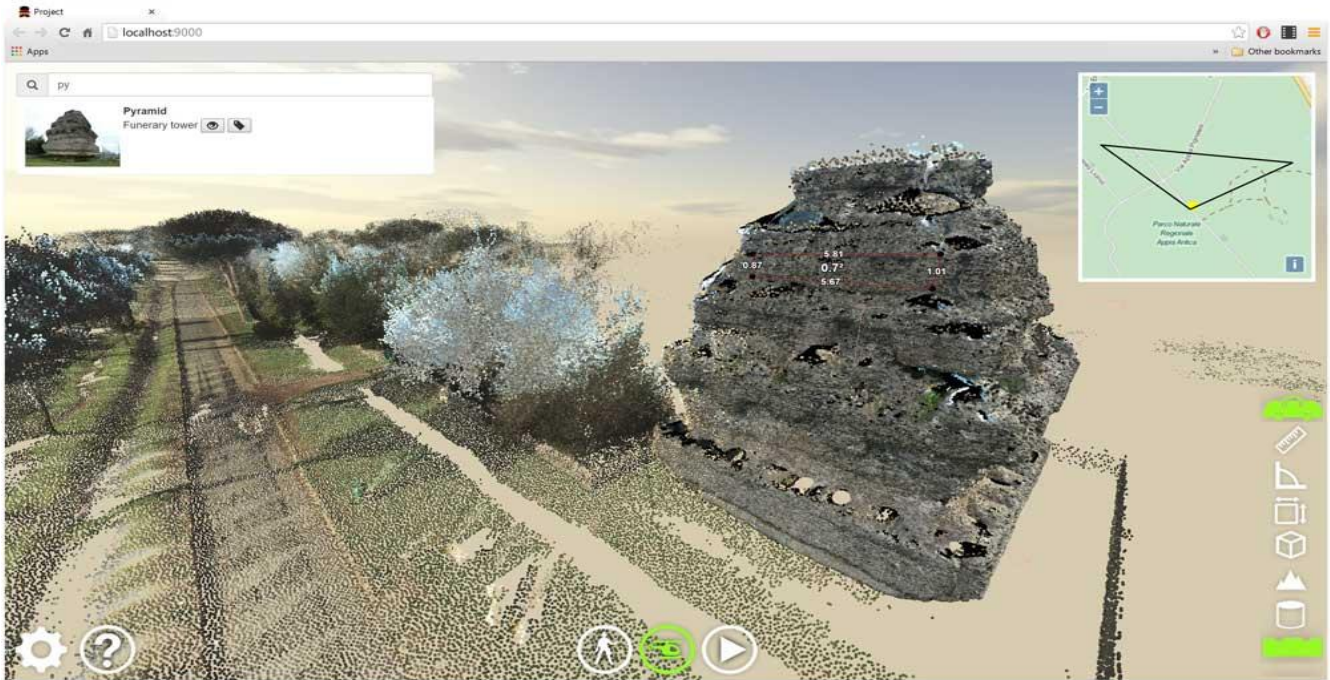


Did you know?

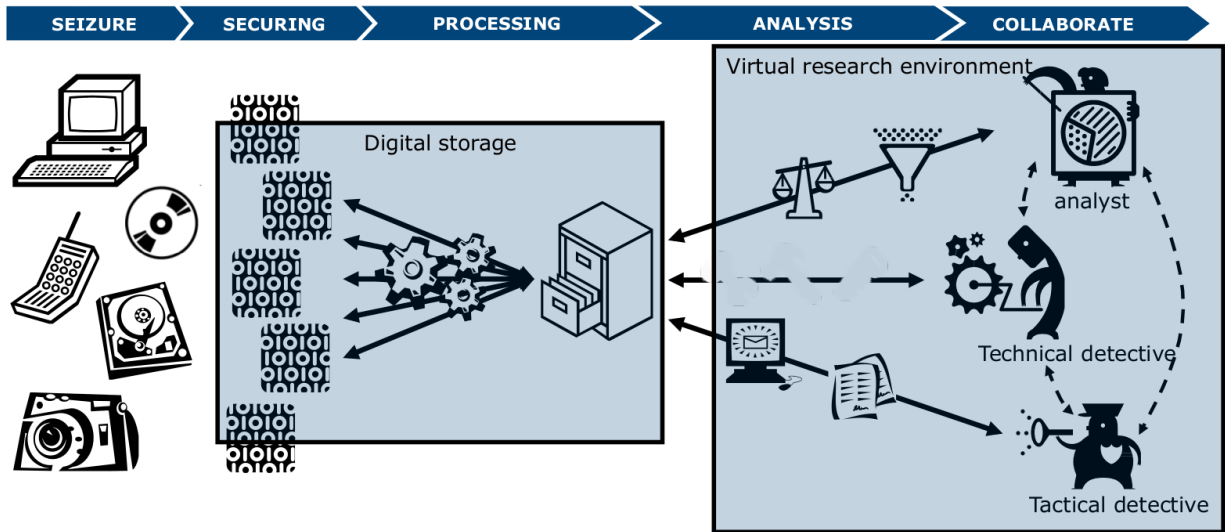
- + The aperture arrays in the SKA could produce more than 100 times the global internet traffic.



Omgaan met ruimtelijke data (4D-GIS)



Digitale informatie in de veiligheidsketen



'Embodied' emoties

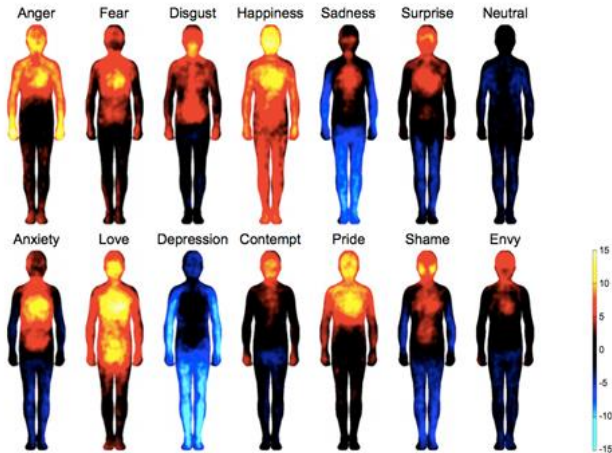
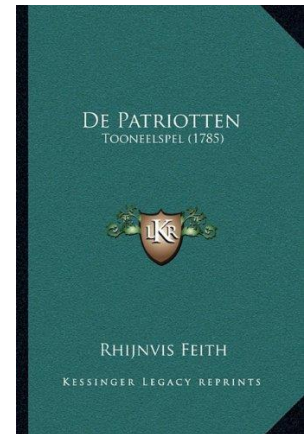
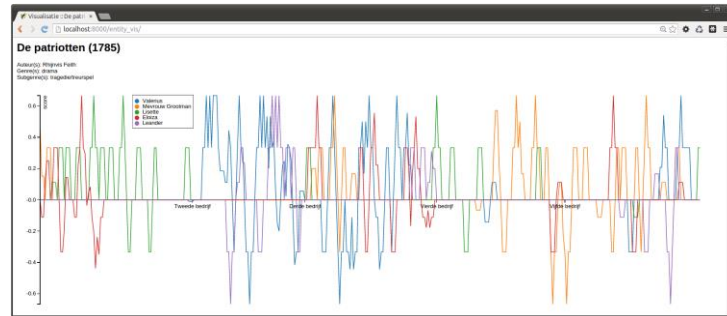
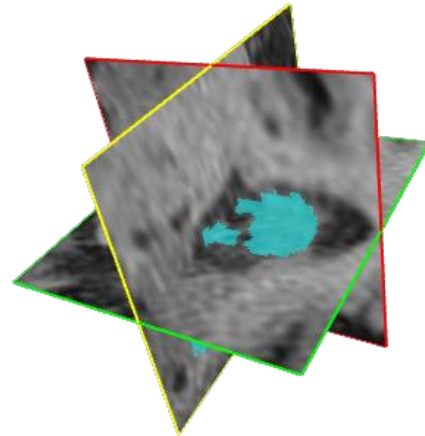
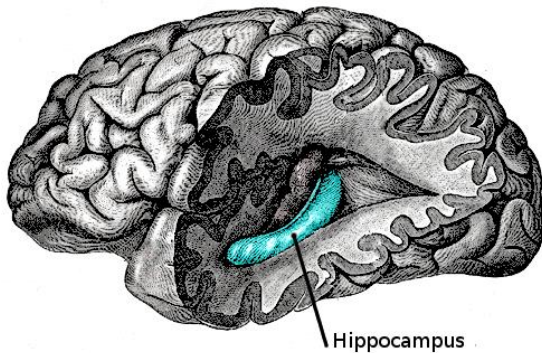


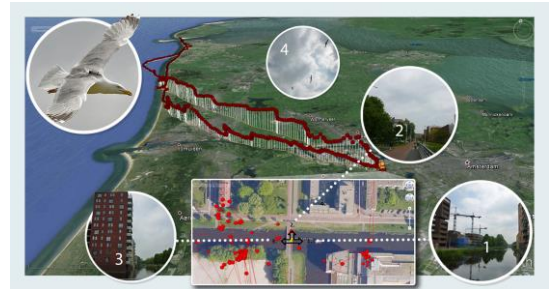
Fig. 2. Bodily topography of basic (Upper) and nonbasic (Lower) emotions associated with words. The body maps show regions whose activation increased (warm color) or decreased (cool color) when feeling each emotion. ($P < 0.05$ FDR corrected; $t > 1.94$). The colorbar indicates the t-statistic range.



Verwerking, analyse en uitwisseling medische gegevens



Citizen science



Data-gedreven wetenschap

- Een succesvolle onderzoeker is (ook) een data onderzoeker
- eScience en e-Infrastructuur (bijv. SURF) zijn integraal onderdeel van het bedrijven van wetenschap
- Grote maatschappelijke vragen hebben een sterke ICT en (big) data component
- Return on investment via open innovatie
- Issues: ethiek, privacy, cybersecurity, open access data stewardship, software sustainability



3rd National eScience
Symposium

Amsterdam Arena
8 October 2015

SCIENTIFIC TRACKS

Humanities
& Social Sciences

Life Sciences
& eHealth

Environment
& Sustainability

Physics & Beyond

Computer & Data
Sciences

Accelerating Scientific Discovery Symposium



This event is free to attend,
but registration is required:

www.eScienceCenter.nl

KEYNOTE SPEAKERS

Prof. José van Dijck
KNAW

Prof. Leonard Smith
London School
of Economics

Prof. Tony Hey
University of Washington

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