Teaching Politics

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Teaching Politics

Topics:

- My background: The German Council for Science and Humanities (“Wissenschaftsrat”)
- When Science advises politics (about informatics)
- Dealing with mutual misunderstandings

Laurentius de Voltolina, 14th c.

German Council for Science and Humanities

- Founded in 1957
- Scientists (also some from industry), media, public figures
- Federal minister of education and research and the ministers of the 16 federal states (“Länder”)

- Advising politics on all aspects of the German science system
  - Evaluations, accreditations, university medicine,…
    German Excellence Initiative,...
  - Recommendations on current issues and challenges

Policy advice by scientists

- German Council…
- Science Advisor to the President in the US,
  Group of Chief Scientific Advisors of the EC,…
- Learned Societies, e.g. Leopoldina in Germany
- …
- “Self-appointed” individuals

But what are the consequences of advice from science?

Policy advice by scientists

Science

- Understanding complexity
- Generating findings
- Deep insights
- Long-term knowledge
- Eternal truth

Politics

- Pragmatic basis
- React to urgent issues
- Fashionable topics
- Short-term framework
- Win elections

Together, both strive for good, implementable solutions and for simple, easy-to-communicate explanations.

But why “teaching” politics?

Politics’ Challenges

- Lack of patience for detailed, in-depth explanations
- Lack of basic knowledge
- Knowledge from the media

Role of Science

- Provide simple, yet correct explanations
- Trustworthiness through seriousness
- Correction, without debasing the media

Both must find a common language for successful communication.

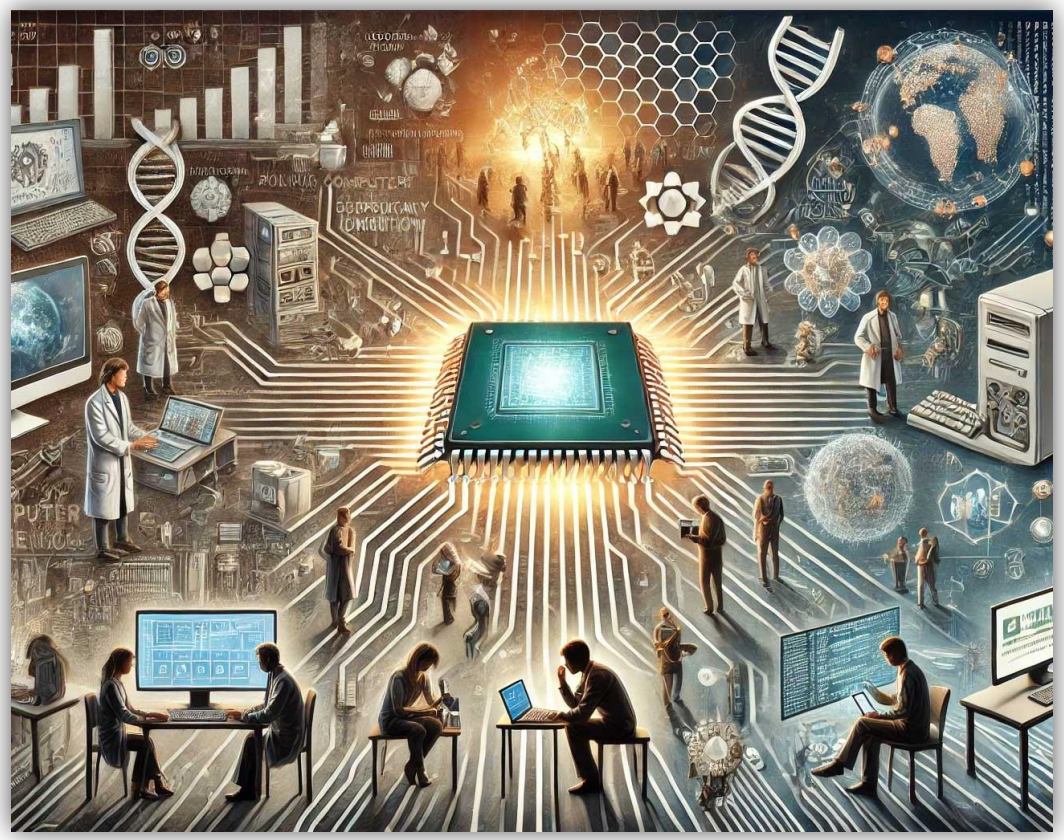
Politics' knowledge of informatics

- Challenged by the rapid development
- Influenced by media, interests of industry, view of other disciplines,…

→ Undue expectations of informatics

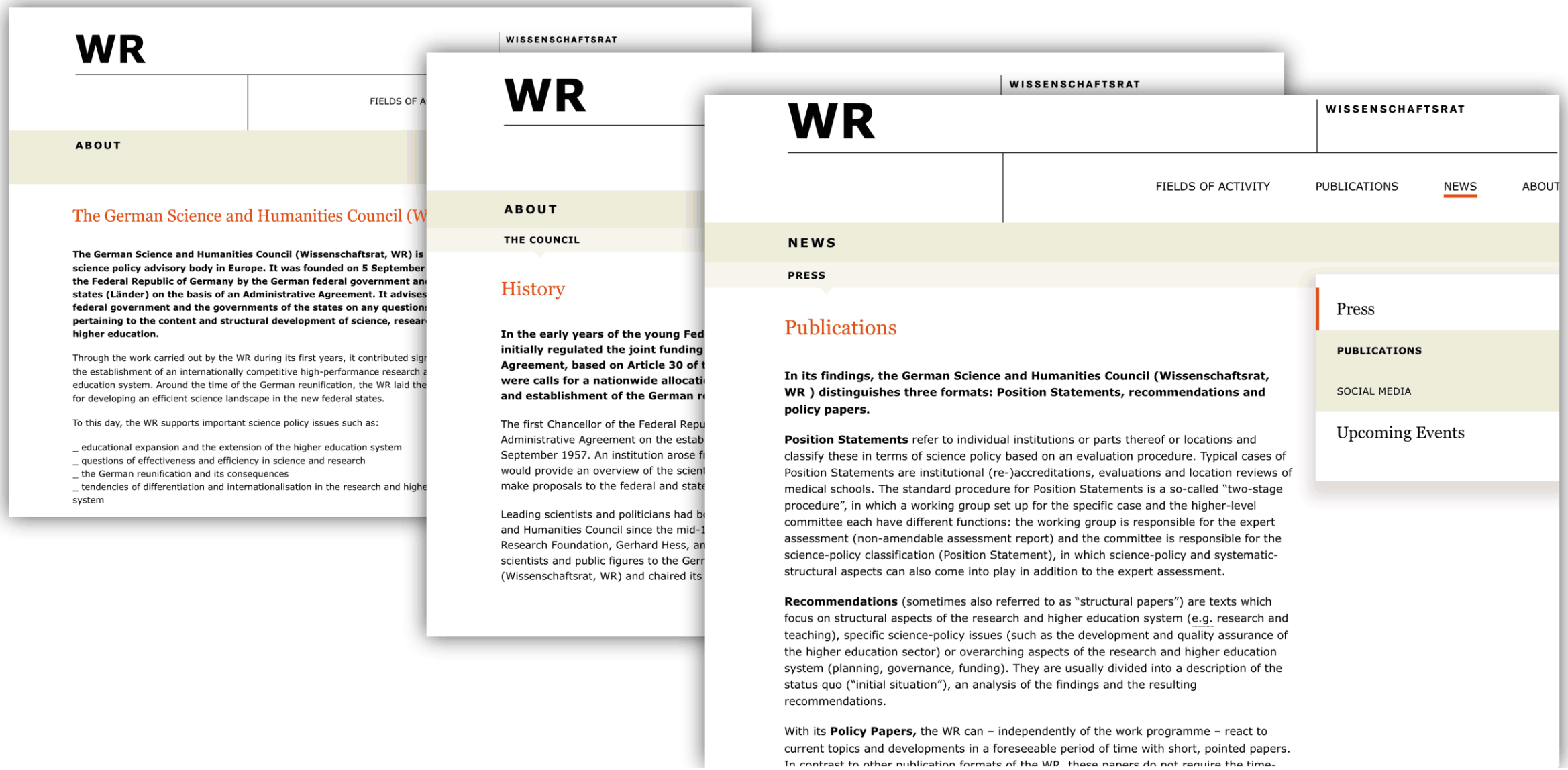
→ Shift of political focus

Activities of the Council ("WR")
in this context?



Source: ChatGPT

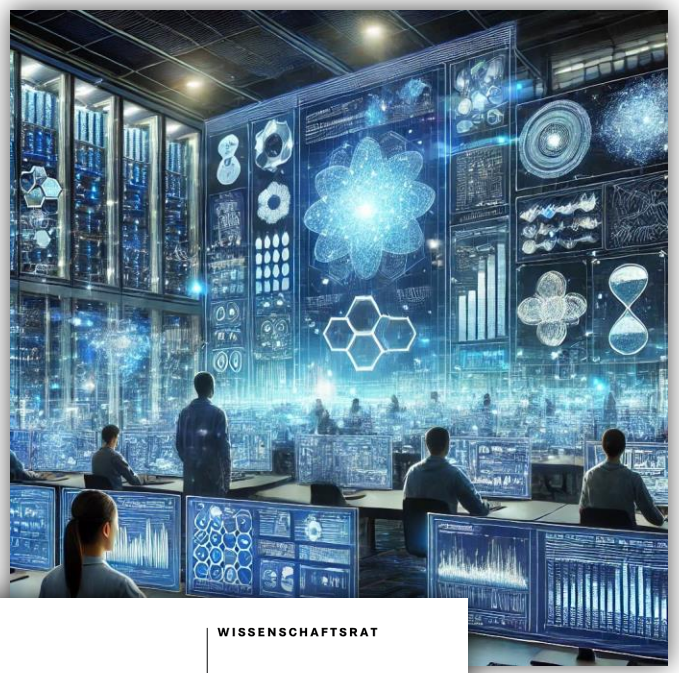
Some recent publications from the “WR”



1) Data-intensive research

- Research data as an infrastructure
- Sustainable software development
- Data sharing and open access publication
- Reuse and reproduction of data

- Recognition of data curation and software development as research results
- Scientific standards
- …



Source: ChatGPT

2) Sovereignty and security of science in the digital space

- Governance structures supporting digital empowerment
- Professionalization and attractiveness of the employment sector
- Raising awareness of dependencies and risks
- Overarching cooperation, advisory services, competence centers,…
- Permanent task that needs permanent financing

→ Recommendations with financial consequences are challenging!

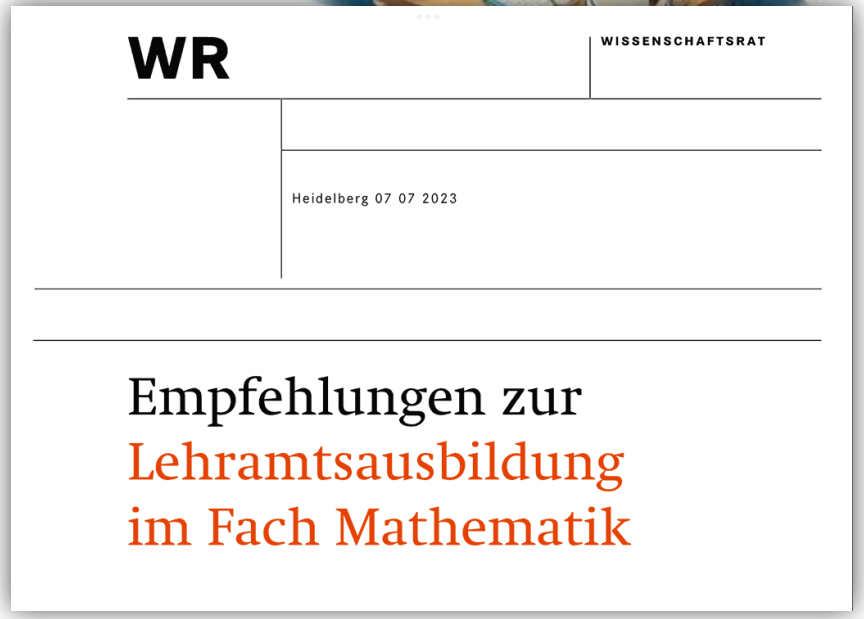
Source: ChatGPT

3) Teacher training in mathematics

Persistent decrease of student competences

- Teacher training core task at the training institutions
- Studies program integrating theoretical and practical phases
- Single-subject teacher training for mathematics specialists
- New ways for career changers
- Shorten the training path for teachers
- Eliminate gap between the two training phases
- Increase attractiveness of the teaching profession

Source: ChatGPT



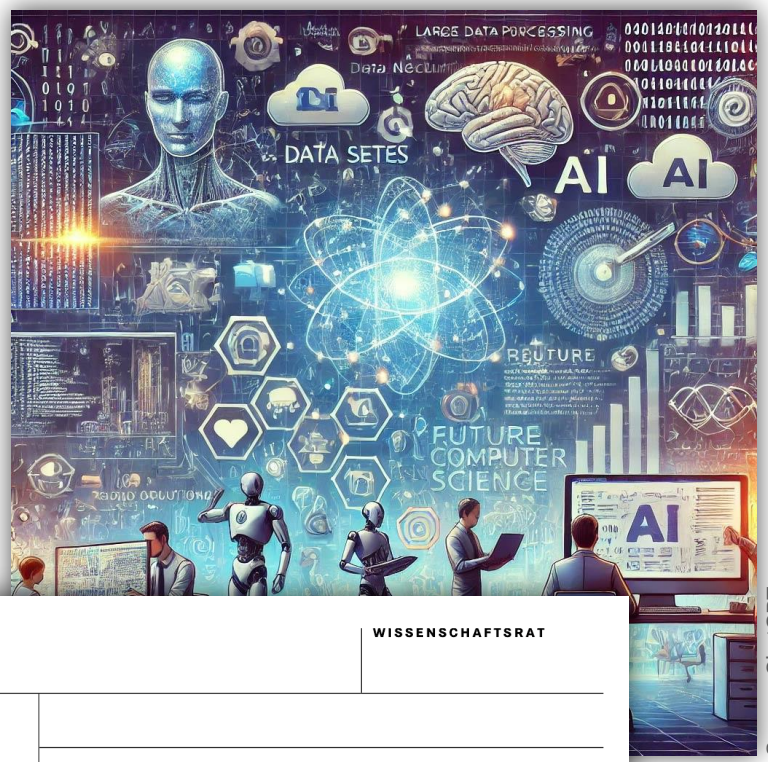
WR WISSENSCHAFTSRAT

Heidelberg 07 07 2023

Empfehlungen zur Lehramtsausbildung im Fach Mathematik

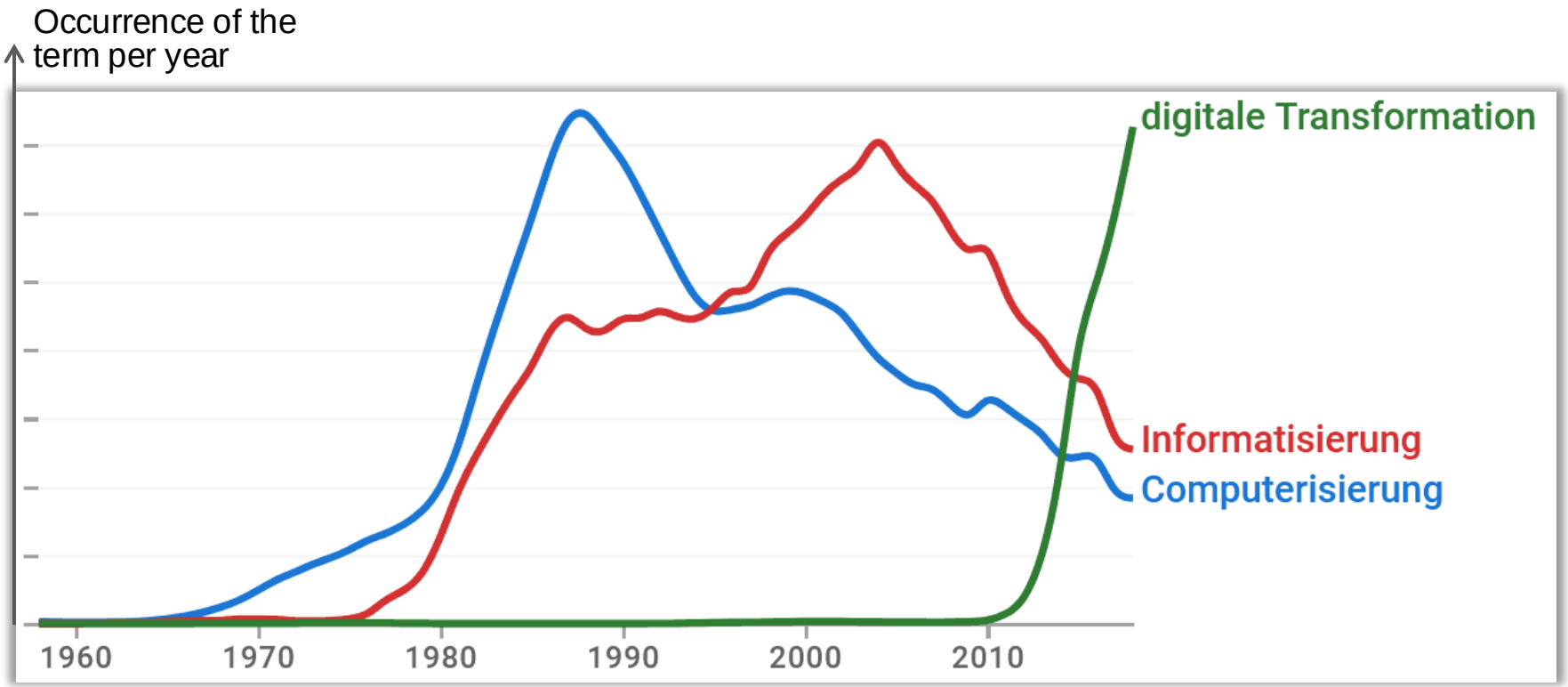
4) Perspectives of informatics

- Pooling of forces, profile building at the various locations
- Balanced funding policy
- Measures in the competition for top talents
- Attract more students, increase students' success rate
- Larger and broader range of study programs
- Education in computer science at schools
- More active role in communication with society, media and politics

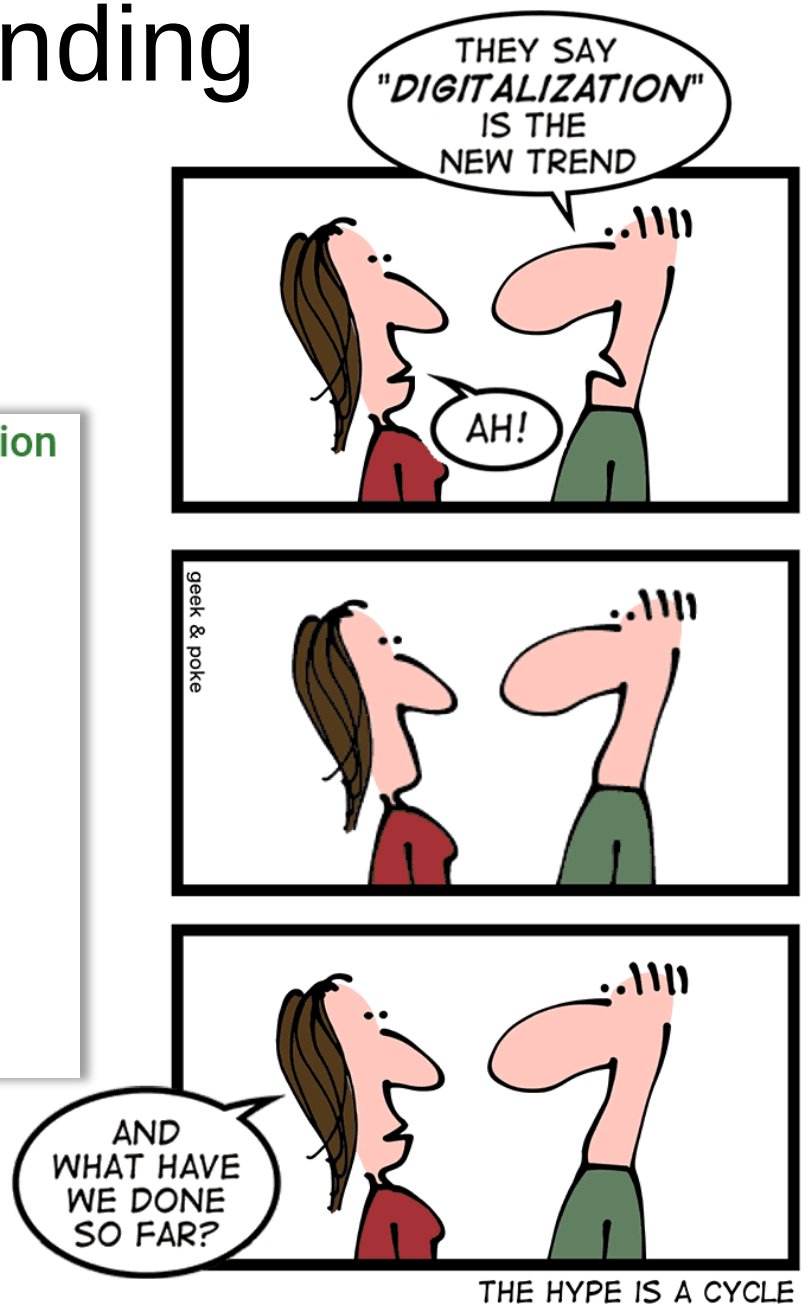


Source: ChatGPT

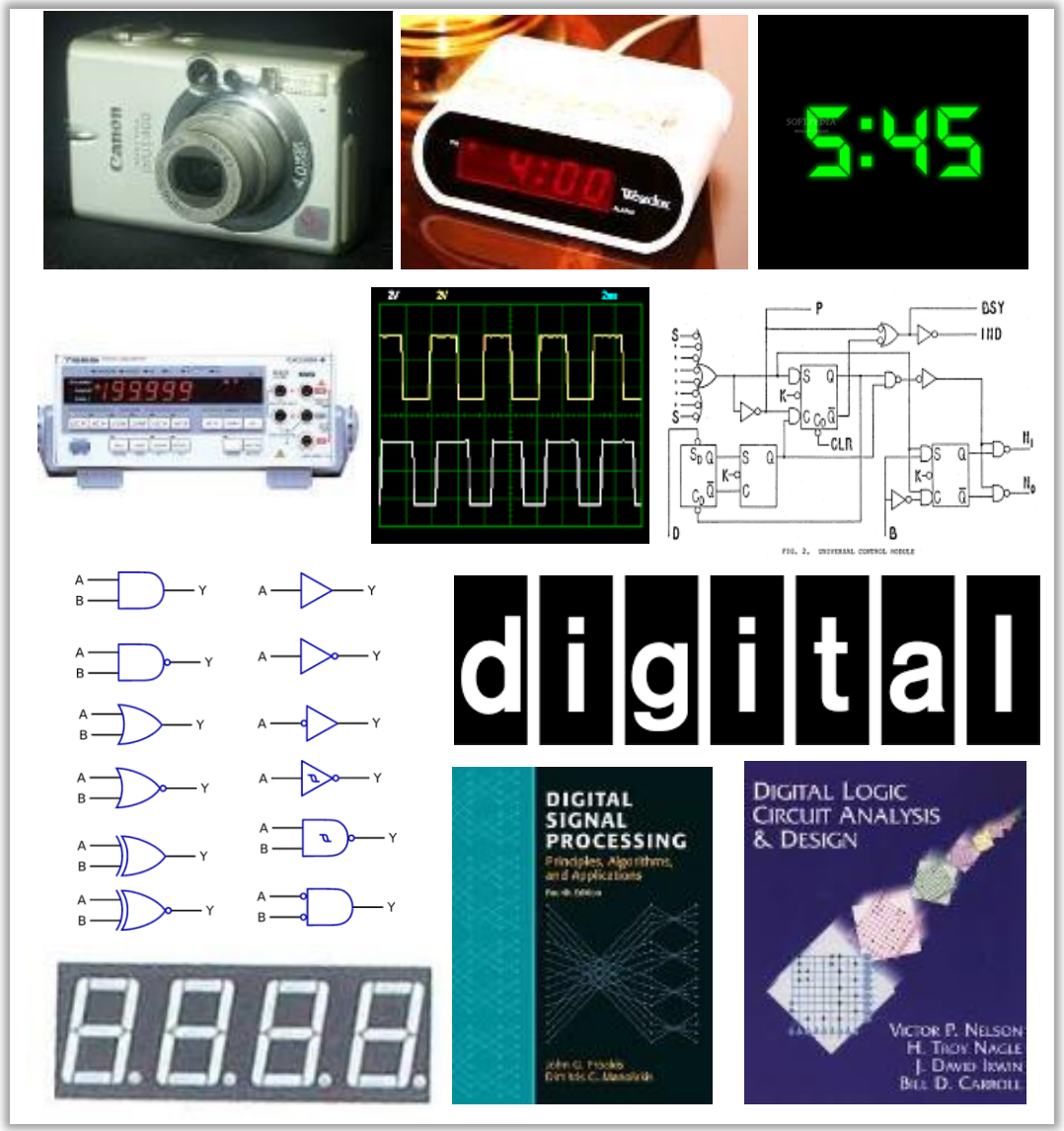
Understanding and misunderstanding “Informatics”: *Digitalization*



Source: Google Books



Search results for "digital" on Google in 2006
– rectangular formats dominate



10 Years

Search results for "digital" on Google in 2016
– shades of blue dominate → unlimited sky,…

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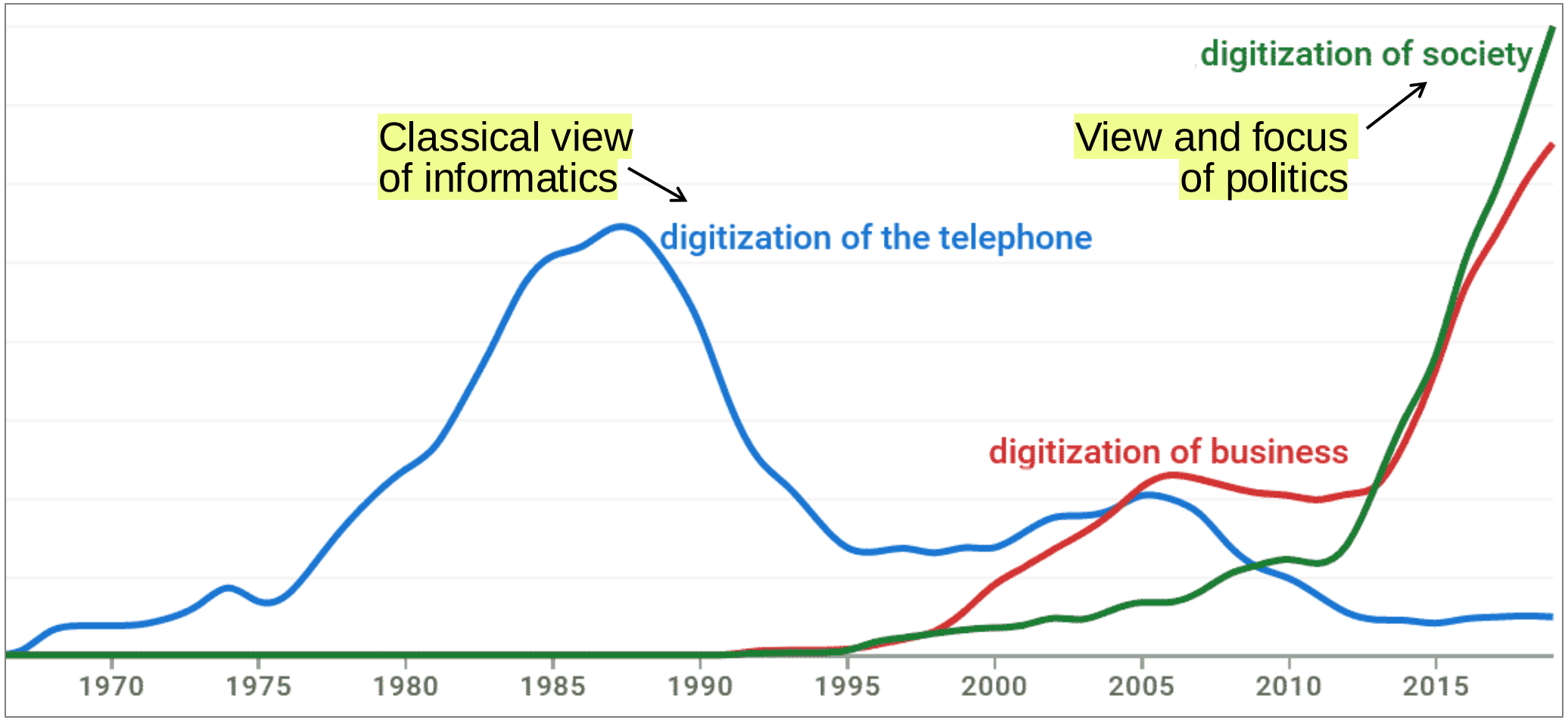
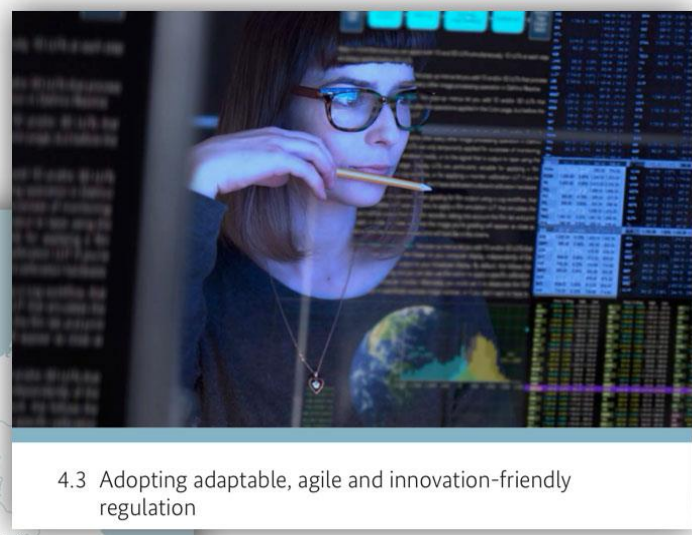


Understanding and misunderstanding *Artificial Intelligence*



4.3 Adopting adaptable, agile and innovation-friendly regulation

The Federal Government

KI Nationale Strategie für Künstliche Intelligenz
AI Made in Germany

Artificial Intelligence Strategy

Status: November 2018

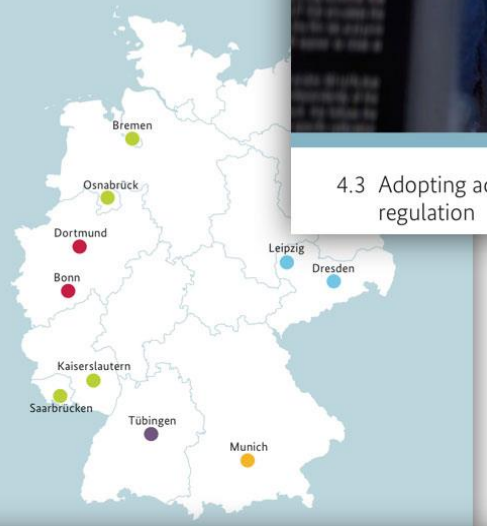
Federal Ministry of Education and Research

Action Plan Artificial Intelligence by the BMBF

Tackling new challenges – seizing opportunities

Centres of Excellence for AI Research

- German Research Center for Artificial Intelligence
- BIFOLD – Berlin Institute for the Foundations of Learning and Data
- MCML – Munich Center for Machine Learning
- Lamarr Institute for Machine Learning and Artificial Intelligence
- ScaDS.AI – Center for Scalable Data Analytics and Artificial Intelligence
- TUEAI – Tübingen AI Center



AI professorships at German universities

Universities
RWTH Aachen University · University of Bayreuth · Freie Universität Berlin · Humboldt Universität zu Berlin · Technische Universität Berlin · Bielefeld University · Ruhr University Bochum · University of Bonn · Technische Universität Braunschweig · University of Bremen · Clausthal University of Technology · Technical University of Darmstadt · TU Dortmund University · TUD Dresden University of Technology · HHU Düsseldorf · University of Duisburg-Essen · Catholic University of Eichstätt-Ingolstadt · FriedrichAlexander Universität Erlangen-Nürnberg · Goethe University Frankfurt am Main · Giessen University · University of Göttingen · Martin Luther University Halle-Wittenberg · TU Hamburg · Universität Hamburg · Leibniz University Hannover · Heidelberg University · University of Hildesheim · Technische Universität Ilmenau · Karlsruhe Institute of Technology · University of Kassel · University Kaiserslautern · Kiel University · University of Koblenz-Landau · University of Cologne · University of Konstanz · Leipzig University · University of Magdeburg · Philipps-Universität Marburg · Ludwig-Maximilians-Universität München · Technical University of Munich · University of Münster · University of Oldenburg · University of Rostock · Saarland University · University of Siegen · University of Stuttgart · University of Tübingen · Julius-Maximilians-Universität Würzburg

Number of new AI professorships at this location

Understanding and misunderstanding *Algorithms*

Source: The Telegraph

Source: The Telegraph

Understanding and misunderstanding *Algorithms*

In December 2019, the Department of Computer Science at ETH Zurich felt compelled to criticize the increasing equation of algorithms and artificial intelligence even within ETH. The reason for this was the draft of ETH Zurich's new strategy plan. A letter to ETH's administration states:

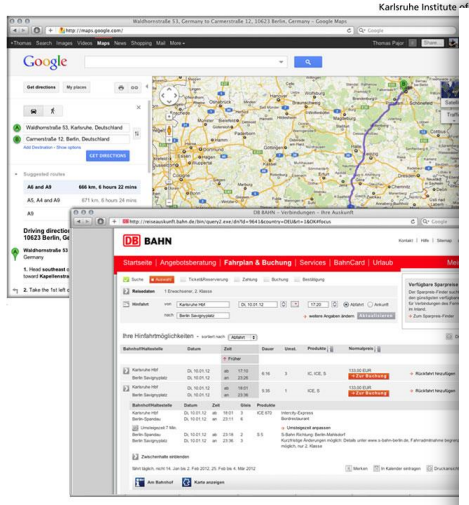
> *We strongly urge a clear distinction between "algorithms" and "artificial intelligence", partly because it reflects reality, but mostly because the confusion of these* ***two very different concepts*** *in popular discourse muddies the already difficult discussion of the implications of "Digitalisierung".*
>
> *For clarity, "algorithms" are a foundational concept in computer*

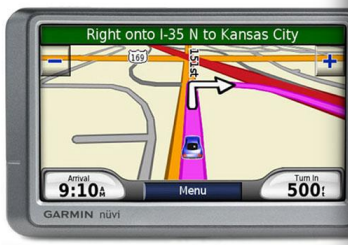
AI and algorithms

Algorithms for route planning in transportation (one of my research topics)

Showpiece for AI?

Motivation





Important applications, e.g.,

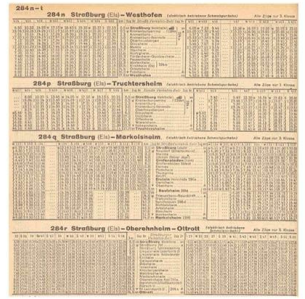
- Navigation systems for cars
- Apple Maps, Google Maps, Bing Maps, OpenStreetMap, . . .
- Timetable information

Energy Consumption of Electric Vehicles:

- Restricted battery capacity
- “Range anxiety”

Customizable Metrics and Time-Dependency:

- User preferences
- Traffic congestion
- Historic travel time data



Timetable Information:

- Shortest paths in a timetable graph
- Timetable graphs differ from road graphs

Multimodal Route Planning:

- Incorporate unrestricted walking
- Change mode of transportation during the journey

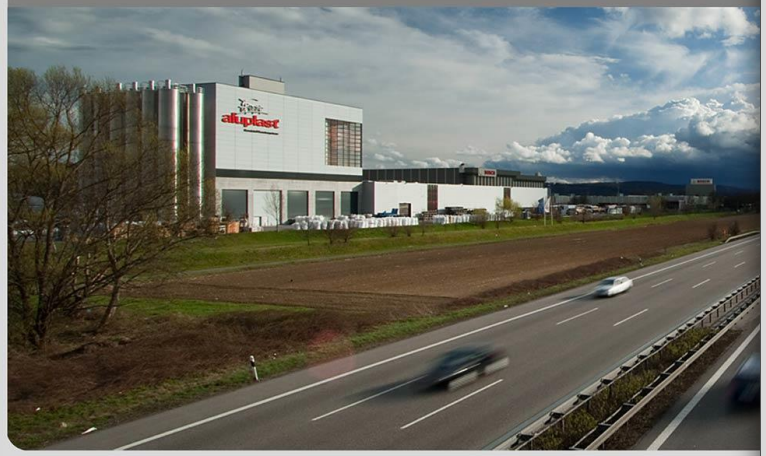
Karlsruhe Institute of Technology

The Impact of Route Algorithms in Practic

SEA 2018, L'Aquila

Dorothea Wagner | June 28, 2018

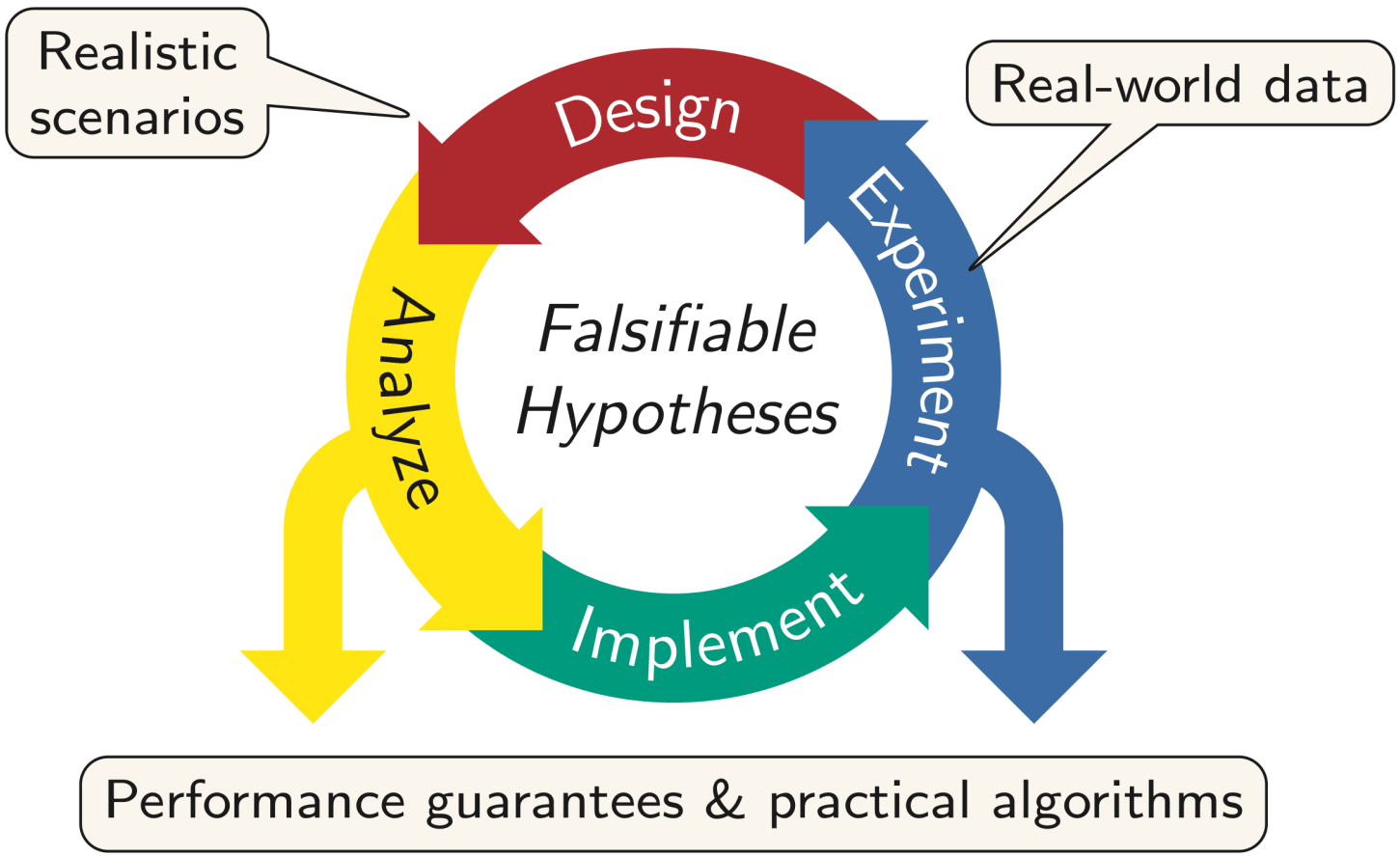
KARLSRUHE INSTITUTE OF TECHNOLOGY – INSTITUTE OF THEORETICAL INF



KIT – University of the State of Baden-Wuerttemberg and
National Laboratory of the Helmholtz Association

Showpiece of Algorithm Engineering

Karlsruhe Institute of Technology



Teaching Politics

Policy advice from science involves a number of pitfalls:

- Different goals and priorities
- Different understanding of terms
- Different knowledge,…

Our task as scientists:

- Deal with it
- Teaching is a main part of our job anyway!

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