Teaching Politics

Dorothea Wagner Karlsruhe Institute for Technology

Teaching Politics

Topics:

- My background: The German Council for Science and Humanities ("Wissenschaftsrat")
- When Science advises politics (about informatics)

Algorithm = ... ! Digitalization = ... ! AI = ... !

- 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,...
- \rightarrow Undue expectations of informatics
- \rightarrow Shift of political focus

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



Some recent publications from the "WR"

WR	WISSENSCHAFTSRAT				
			WISSENSCHAFTSRAT		
FIELDS OF A		WR		WISSENSCHAFTSRAT	
ABOUT					
The German Science and Humanities Council (W	ABOUT		FIELDS OF ACTIVITY	PUBLICATIONS	NEWS AB
	THE COUNCIL	NEWS			
The German Science and Humanities Council (Wissenschaftsrat, WR) is science policy advisory body in Europe. It was founded on 5 September the Federal Republic of Germany by the German federal government an states (Länder) on the basis of an Administrative Agreement. It advises federal government and the governments of the states on any question pertaining to the content and structural development of science, resear- higher education. Through the work carried out by the WR during its first years, it contributed sign the establishment of an internationally competitive high-performance research a education system. Around the time of the German reunification, the WR laid the for developing an efficient science landscape in the new federal states. To this day, the WR supports important science policy issues such as: _ educational expansion and the extension of the higher education system _ questions of effectiveness and efficiency in science and research _ the German reunification and its consequences _ tendencies of differentiation and internationalisation in the research and highe system	History	PRESS Publications In its findings, the German Science and Humanities Council (Wissenschaftsrat, WR) distinguishes three formats: Position Statements, recommendations and policy papers. Position Statements refer to individual institutions or parts thereof or locations and classify these in terms of science policy based on an evaluation procedure. Typical cases of Position Statements are institutional (re-)accreditations, evaluations and location reviews of medical schools. The standard procedure for Position Statements is a so-called "two-stage procedure", in which a working group set up for the specific case and the higher-level committee each have different functions: the working group is responsible for the expert assessment (non-amendable assessment report) and the committee is responsible for the science-policy classification (Position Statement), in which science-policy and systematic- structural aspects can also come into play in addition to the expert assessment.		1	
	In the early years of the young Fed initially regulated the joint funding Agreement, based on Article 30 of t were calls for a nationwide allocati and establishment of the German re The first Chancellor of the Federal Repu Administrative Agreement on the estab September 1957. An institution arose fo would provide an overview of the scient			Press	
				SOCIAL MEDIA	
				Upcoming Events	
	make proposals to the federal and state Leading scientists and politicians had be and Humanities Council since the mid-1 Research Foundation, Gerhard Hess, an scientists and public figures to the Gerr (Wissenschaftsrat WR) and chaired its				
		Recommendations (sometimes also focus on structural aspects of the rese teaching), specific science-policy issue the higher education sector) or overary system (planning, governance, funding status quo ("initial situation"), an anal recommendations.	referred to as "structural papers") are texts which earch and higher education system (e.g. research and es (such as the development and quality assurance of ching aspects of the research and higher education g). They are usually divided into a description of the lysis of the findings and the resulting		

With its **Policy Papers**, the WR can – independently of the work programme – react to current topics and developments in a foreseeable period of time with short, pointed papers. In contrast to other publication formats of the WP, these papers do not require the time-

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

WR VISSENSCHAFTSRAT 2020 Zum Wandel in den Wissenschaften durch datenintensive Forschung Positionspapier

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!



der Wissenschaft

im digitalen Raum

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



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



in Deutschland

Understanding and misunderstanding "Informatics": *Digitalization*



THEY SAY

IS THE NEW TREND

....

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



Search results for "digital" on Google in $\frac{2016}{-}$ shades of blue dominate \rightarrow unlimited sky,...



Understanding and misunderstanding "Informatics": *Digitalization*



Understanding and misunderstanding Artificial Intelligence





AI professorships at German universities

Universities

Centres of Excellence for AI Research

DEC Stanto

German Research Center

BIFOLD – Berlin Institute for the

MCML - Munich Center

for Machine Learning

and Artificial Intelligence

ScaDS.AI – Center for Scalable

Tübingen Al Center

Data Analytics and Artificial Intelligence

LAMARR

Lamarr Institute for Machine Learning

ScaDS.All

Foundations of Learning and Data

memu

for Artificial Intelligence

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 Erlange Nürnberg · Goethe University Frankfurt am Main Giessen University - University of Göttingen - Martin Luther University Halle-Wittenberg · TU Hamburg Universität Hamburg - Leibniz University Hannove 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 · Unive sity of Konstanz · Leipzig University · University of Magdeburg · Philipps-Universität Marburg · Ludwig-Maximilians-Universität München · Tech nical University of Munich - University of Münster University of Oldenburg - University of Rostock -Saarland University · University of Siegen · Univer sity of Stuttgart · University of Tübingen · Julius-Maximilians-Universität Würzburg

Number of new AI professorships at this location



Understanding and misunderstanding *Algorithms*





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)



Motivation

Ansterdam Ansterdam 11:02 11:02 100-00 Tomrom

Important applications, e.g.,

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



Showpiece for AI?

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







Institute for Theoretical Informatics Chair Algorithmics



The Impact of Route Algorithms in Practic

SEA 2018, L'Aquila Dorothea Wagner | June 28, 2018

KARLSRUHE INSTITUTE OF TECHNOLOGY - INSTITUTE OF THEORETICAL IN



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

Showpiece of Algorithm Engineering



Dorothea Wagner – The Impact of Route Planning Algorithms in Practice June 28, 2018



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!



Teaching Politics

Dorothea Wagner Karlsruhe Institute for Technology