

Digital Humanism

Introduction

Hannes Werthner
DigHum
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Some Years Ago

1990
Car phone



1992
Motorola 3200
The first digital hand-size
mobile telephone

The Google logo, consisting of the word "Google" in its characteristic multi-colored font (blue, red, yellow, blue, green, red).

Sep 4, 1998

Today





- We live in a digital – physical world
- It is public space: participation (almost) mandatory, not to be excluded

Today

- Digital transformation = **Informatization** of our societies
complex socio-economic technical process changing us and the world
- Internet / Web global infrastructure
- Informatics / its tools „operating system“ of our society

Remember Covid - showed power of Internet / Web, but also shortcomings

- limitations w.r.t. to social / organizational embeddedness
- few technical problems

Informatics

- Very short history, from first study programs in 60s/70s to *Latin of today*- A. Loprieno (Egyptologists, Chair ASC)
- Computer Science / Informatics (its methods, paradigm, artefacts) broad and foundational
 - i) *Informatics as subject*, ii) *Informatics in subject*
- Kristen Nygaard: Informatics as the science that has as its domain information, information processes and related phenomena in artifacts, society and nature

Algorithmic solution of problems vs understanding of human thinking:

- Simulation (e.g., IAS Computer Von Neumann, simulation and weather forecast)
- Turing with his Turing Test / defining intelligence

Informatics cont

- Metamorphosis from a computer to pervasive global machine (sometimes invisible)
- Technical view: Systems consist of a stack of different pieces (hard and software)
 - Increasingly delegation to software -> virtualization, provides flexibility
 - Example car industry / car software and info hub
- Everything touched by SW becomes a computer - connected (& global)
- Not to forget: Digital divide

Short - Artificial Intelligence

- Simulation of human behavior, machines showing “intelligent” behavior
 - Hard to define AI systems, refers rather to complex SW systems (European AI regulation)
 - What is intelligence, all in the brain - or embodied (and socially/culturally embedded)?
- Since its start in 50s (Dartmouth Conference) several AI winter and summer
- **Symbolic vs. Data driven** paradigm
 - Current success based on: technology stack (computing power and memory) and accessible huge amount of data
 - High concentration, imbalance between public and private funding
- AI next wave of digitalization
- Roy Amara (President IFTF): **We tend to overestimate the effect of a technology in the short run and underestimate it in the long run**

Artificial Intelligence / Discussion

- Between amazing AND threatening
- Critique on **anthropomorphic** notion Artificial Intelligence
- **Business as usual**
 - Historic hypes in Computer Science, e.g., expert systems, blockchains
- **Amazement and enthusiasm**
 - Something unexpected happened (even for developers)
 - Limits of these systems to be compared to the limits of human reasoning
- **Existential threats warnings**
 - Letter Future of Life Institute; Geoffrey Hinton: existential risk
- In both positions some who consider AGI impossible; and who do not exclude it
- **Hype warners** (Gebru, M. Whittaker): real danger somewhere else
- **Cautious ones**: potential good uses, but look at social disruption, democracy
- **Answers**: continue as “usual”, moratorium, regulation, alternatives (“CERN”, “IAEA”)

Internet / Web: more than Technology

- Economic transformation (companies, markets)
- Social „expansion“
- Law and politics
- Physical spaces
- Psychology
- (International) Politics

Vilnius



Augsburg



- Internet / Web also rooted in the US counterculture (e.g., Declaration of the independence of the cyberspace), see also (Vardi, 2018)
 - Free information sharing - > huge amount of information and rise of search engines
- To sustain (monetize): advertising based business model, extended by
 - **Personalization** (*"If we have 4.5 million customers, we have 4.5 million stores"* J. Bezos)
 - **Recommendation** (e.g., Amazon Marketplace and its 350 Mio products)
 - **Emotional engagement** to optimize click rates
 - Changing user behavior following recommendations (Russell 2021)
- Pay with our data -> surveillance (Zuboff, 2019)
- From **citizen** to **consumer**
- We are **user**, **product** and **producer** (nearly an economic perpetuum mobile)

- We seem to have absolute individual freedom
- Individual freedom as fiction: *what I see, what I get, what I do* is defined by distance measure of a similarity matrix
- Algorithmic interdependence between the individual (and its self-referentiality) and the common
- Also this “common” is a fiction; is an aggregation of previously individualized views
- Algorithm (mostly unknown) instead of conscious decision of the human
- **Fiction of individual freedom, fiction of the seemingly common**
- Vision of individual freedom and democratic participation -> the system is failing
- And: distributed architecture as basis of a centralized structure?

Role of IT

IT
supports
the Business



IT
enables
the Business



IT
runs
the Business



IT
is
the Business



Increasing informatization, from companies to markets to society

Economic Observation

- Focus was on automation and efficiency, not resilience (except a famous example?)
 - *Outsourcing* (e-commerce, also recommender)
 - *Privatization*: public data now to be “owned” by IT companies (e.g., AI tools; Google and Wikipedia (Vincent and Hecht 2021)).
- In contrast to promises of IT since 80s (time of PC) increased income inequality in practically all major advanced economies
- Productivity growth has slowed down - productivity paradox (Robert Solow)
- Labor’s share of income fell significantly (Acemoglu and Restrepo, 2019).
- Shared responsibility: neoliberal ideology; massive decrease in regulations, ongoing concentration
 - Technology facilitated this process

Web Business Landscape

- Google 1998
 - YouTube 2005
 - Skype 2003
 - Amazon 1994
 - Twitter 2006
 - Facebook 2004
 - LinkedIn 2003
 - Uber 2009
 - Airbnb 2008
 - Instagram 2010
-
- Platform companies
 - Basis: user network and information from / about users as well as markets
 - Virtualization of business (not only technology)
 - Innovation from outside, permanently new "players"

Platforms and Market Capitalization

June 2023, Mio USD

Apple	3,050,000
Microsoft	2,532,000
Alphabet	1,532,000
Amazon	1,337,000
Nvidia	1,044,000
Tesla	829,670
Berkshire Hathaway	745,010
Meta	735,450
TSMC	523,410
Visa	497,370

March 2011, Mio USD

Exxon Mobil	417,166
PetroChina	326,199
Apple Inc.	321,072
ICBC	251,078
Petrobras	247,417
BHP Billiton	247,079
China Construction Bank	232,608
Royal Dutch Shell	226,128
Chevron Corporation	215,780
Microsoft	213,336

List of top publicly traded companies - based Financial Times Global 500, no investment companies

https://en.wikipedia.org/wiki/List_of_public_corporations_by_market_capitalization#2021

Platforms

- Platform: virtual place where suppliers and consumers meet
 - Technology/service for an "open ecosystem" of users and companies
 - Organizational arrangement, governed by common rules and architecture
 - Network effects - value grows with number of participants -> **Winner takes it all**
-
- Companies active in several markets with shares of 50-90%, very profitable
 - Acquisitions of companies (not always taking advantage of innovations)
 - Investing in R&D ("brain") - competing with universities

Two Sides

- IT keeps the system running
- Important for democratic movements, participation and humanitarian activities

SUSTAINABLE DEVELOPMENT GOALS



Critical issues (mutually dependent)

- Concentration and monopolies in the Web
 - Sovereignty – states as well as individuals (see Corona Apps)
 - Echo chambers and fake news – with its impact on political discourse
 - AI and decision making (role of humans)
 - Privacy and surveillance, power gap between the surveilled and the surveilling (Zuboff, 2019)
 - Robots and warfare - risk of weaponization of IT / AI systems
 - Work situation and automation (Casilli 2022, gig economy)
 - Digital divide (access to information, participation in development)
-
- The system is failing – Tim Berners-Lee, 2018
 - AI also example of these two sides

Digitale Humanism – Workshop in 2019

- 100 participants - worldwide – informatics, philosophy, history, anthropology, law, economics, political science, mathematics, sociology
 - Triggered by an Advisory Board Meeting of Informatics Faculty, TUW in 2018
- See. <https://dighum.ec.tuwien.ac.at/>



Popper (1969) “Moral Responsibility of the Scientist”

Digital Humanism

Approach to describe, analyze and, above all, to try to influence the complex interplay between IT and humanity - for a society that fully respects universal human rights

Complex social economic technical process, with its own dynamics

But it is not automatic / deterministic nor “god-given”

VIENNA MANIFESTO ON DIGITAL HUMANISM

- Technology according to our values and needs, we are the designers & developers
- We humans (all) have the freedom, right and responsibility to use our own minds
- We are the authors of our own lives, with personal autonomy and agency
- This is a prerequisite for a democratic society
- Refers – in addition to humanism – to enlightenment (see also Nida-Rümelin & Weidenfeld, 2018)
- I see DigHum as rational democratic answer to the anything goes paradigm of the Web

VIENNA MANIFESTO ON DIGITAL HUMANISM

- It is a call for reflection and **action**, also a research program
- Some core principles:

Democracy

- Digital technologies should be designed to promote democracy and inclusion
- Fairness, responsibility and transparency of software programs and algorithms

Regulation

- Action / intervention against tech monopolies
- Decisions affecting human rights must be made by humans

The Role of Research, Science, and Academia

- The connection of different scientific disciplines is essential
- Universities - create new knowledge, enhance critical thinking - have a particular responsibility
(may also serve to bridge conflicting parts of the world)

Education

- Academic teaching needs to combine humanities, social sciences and engineering
- Education on Informatics and its societal impact must start as early as possible

Since then

Over 50 online lectures and workshops (pandemic)

Large amount of knowledge

Over 100 hours online accessible lectures, see caiml.org/dighum

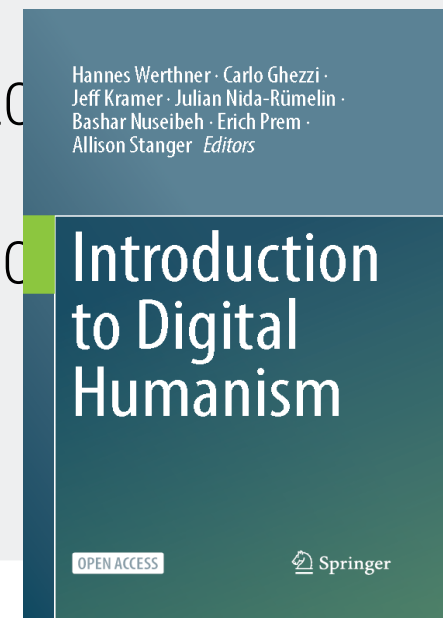


4th DIGHUM WS *Towards a Research and Innovation Roadmap*

- Lectures on
 - Efficiency and resilience
 - AI and ethics
 - Sovereignty
 - Privacy
 - AI Regulation Europe
 - Automation and Work
 - IT, Democracy and Geopolitics
 -
- Manifesto – signatures from 45 countries, we have 8 languages
- In Austrian & Viennese government program
- Poysdorf Declaration on Digital Humanism (Austria, Slovakia, Czech Republic)
- Research programs in Vienna
- IWM fellowship program
-

Since then - 3

- Created an informal international intellectual interdisciplinary core: authors of manifesto and books, members of lecture's Program Committee, speakers
- *Perspectives on Digital Humanism* nearly 390 k downloads
- Roadmap for Research, Innovation and Teaching
- UNESCO chair on Digital Humanism at TUW
- ACM Summer School on Digital Humanism 2022, 2023
- Summit on AI and Democratic Sustainability, July 2023
- In Fall 2023: Textbook – 40 chapters



Things are Changing

- Many international civil society based and academic initiatives
e.g. HAI - Human-Centered Artificial Intelligence at Stanford, Center for Humane Technology, Dutch Digital Society, Digital Enlightenment Forum,
- International standardization organizations: e.g., IEEE Software Engineering Standard

On international political level:

- US: several antitrust cases
- Europe: several acts and proposals (Market Act, Service Act, AI regulation, GDPR)
- Specific DigHum activities at EU level
- UN / Internet as global public good, OECD's principles on AI, UNESCO, G20 AI principles, Global Partnership on AI, ...
- **But we also observe a global conflict, also on a technology level**

And Now

- Systems: global, connected, pervasive, adaptive / learning
- No technological (or economic) determinism
- Human at the center
- Issues for research and teaching

Critical issues	AI & human control	Labor & automation	Surveillance	Platform & monopolies	Online media & fake news	Digital sovereignty	Environment & sustainability
Research topics							
Explainability	x				x		
Transparency	x		x		x		
Privacy	x		x			x	
Personalization	x		x	x	x		
Fairness	x	x		x	x		x
Norms and ethics	x	x	x	x	x	x	x
Accountability of systems and providers	x	x	x	x	x	x	x
Machine/human cooperation and control	x	x	x	x	x		
Participatory approaches	x	x			x		
Security			x			x	
Regulatory approaches	x	x	x	x	x	x	x
DigHum business models			x	x	x	x	x
Content moderation	x		x		x		
Market mechanisms and power relations		x		x		x	
Resilience and efficiency (algorithms and architectures)	x	x		x		x	x
- Open systems engineering (incl. interoperability, open data)			x	x		x	

- *Explainability*
decisions of complex systems (not only AI)
Need for “causal” reasoning
But can't ChatGPT explain everything?
- *Fairness*
who is stakeholder – user, provider, platform – trade offs
who defines: needs sociology, psychology, ...
political question
- *Efficiency vs resilience*
to survive in and to recover fast from critical situations
architectures, governance rules, adaptation and objective function
also political issue
- *Scope of measures*

User at the Center

- USER-CENTERED



James A. Landay, HAI, Stamford

User at the Center

- USER-CENTERED

- COMMUNITY-CENTERED

Drivers of other autonomous & nonautonomous cars, pedestrians, bicyclists, etc


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TECH · SELF-DRIVING CAR

One of the most important features of self-driving cars can fail to spot pedestrians at night, warns auto insurance watchdog

BY TRISTAN BOVE
August 30, 2022 at 3:47 AM PDT



Automatic braking technology has saved lives, but still has a few kinks to work out.
JOHN FREDRICKS—NURPHOTO/GETTY IMAGES

- USER-CENTERED
- COMMUNITY-CENTERED
- SOCIETY-CENTERED
 - City, region

BUILD BETTER PUBLIC TRANSIT INSTEAD?

Bigger Picture

- **Optimization / engineering at individual level** may not be sufficient for system level / society
- Computer Science becomes (also) social science? (Randy Connolly, CACM 2020)
- Computer Science becomes broader and moves to the center of Universities (guiding discipline)

Challenges

- Digital Humanism is a fundamental concept
 - May serve as a European model (vs USA and China)
 - But there are also other parts of the world!
- Heterogeneous audience: academia, industry, citizens decision makers, politicians
- Digital Humanism needs a multidimensional framework - challenges on three levels:
 - **Problem areas**
 - **Disciplines**
 - **Activities**



Pandora, John Gibson, 1899

John von Neumann (1955) : Can we survive technology?
"The great globe itself" is in a rapidly maturing crisis
.... the difficulties are due to an evolution that, while
useful and constructive, is also dangerous.
**Can we produce the required adjustments with the
necessary speed?**

Conclusions

- IT will not stop
 - Further technology and „service“ waves
 - All-encompassing systems, increasing complexity
- Many challenges and questions
- Technology is not deterministic or „god given“, primacy of politics
- Responsibility of scientists (freedom of research), with need for interdisciplinary approaches and cooperations
- At the end, it is about power and politics

Thank you!

caiml.org/dighum