



HOCHSCHULE OSNABRÜCK
UNIVERSITY OF APPLIED SCIENCES

WIR FÜR MORGEN.



URSULA H. HÜBNER

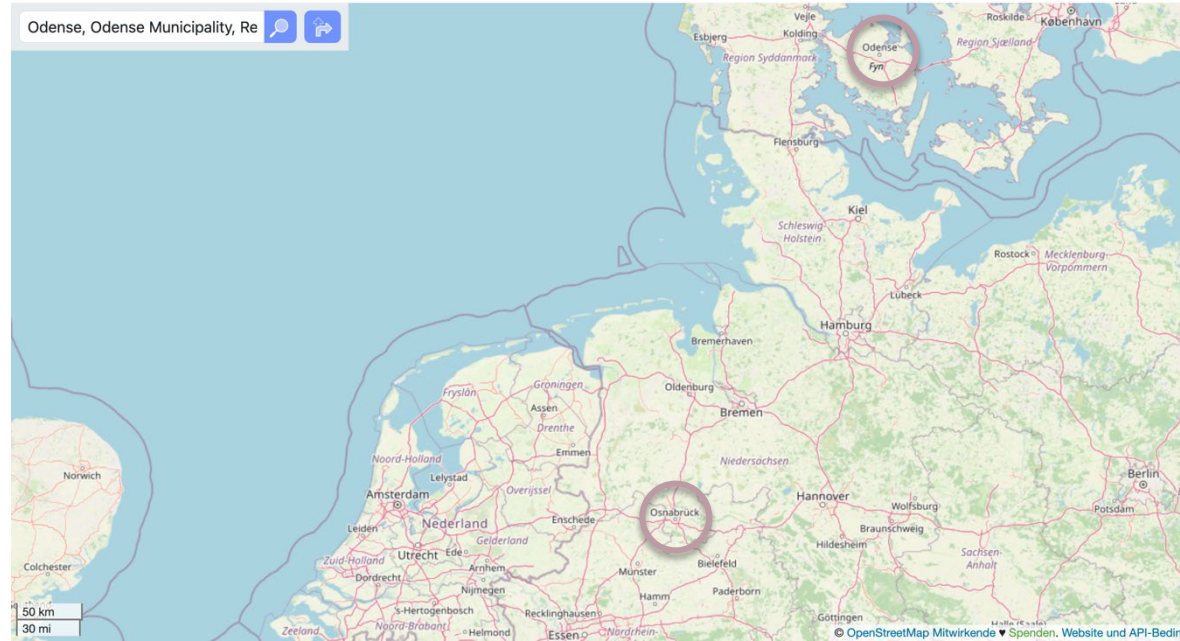
Research Centre for Health and Social Informatics, Osnabrück University of Applied Sciences, Osnabrück Germany



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Human Intelligence

Two factors **fluid** and **crystallized** intelligence as proposed by Cattell in the 1940s. While fluid intelligence is constituted of inductive and deductive **reasoning**, crystallized intelligence represents **acquired knowledge** abilities.

“maximal capacity to achieve a novel goal successfully using perceptual-cognitive [processes].”

Artificial Intelligence

“maximal capacity of an artificial system to successfully achieve a novel goal through computational algorithms”

Gignac GE, Szodorai ET. Defining intelligence: Bridging the gap between human and artificial perspectives. Intelligence, 2024, 104,101832. <https://doi.org/10.1016/j.intell.2024.101832>.

Augmented Human Intelligence

Asimov: “Intelligences together”

Artificial intelligence is no advanced variation of human intelligence.

Merits of both worlds:

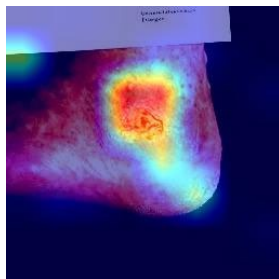
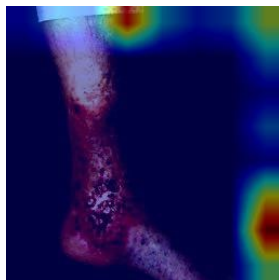
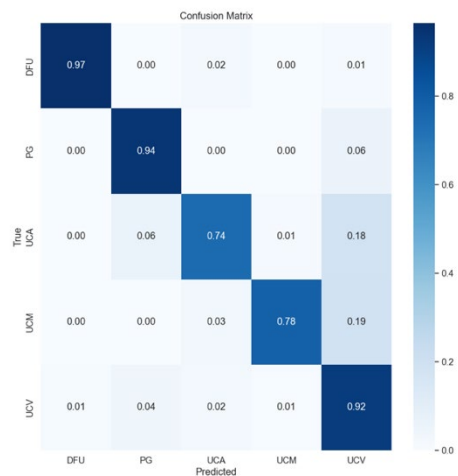
Contextualizing data and getting the bigger picture.

Analysing complex or large amounts of data.

Hübner et al. Chapter 1: Introduction

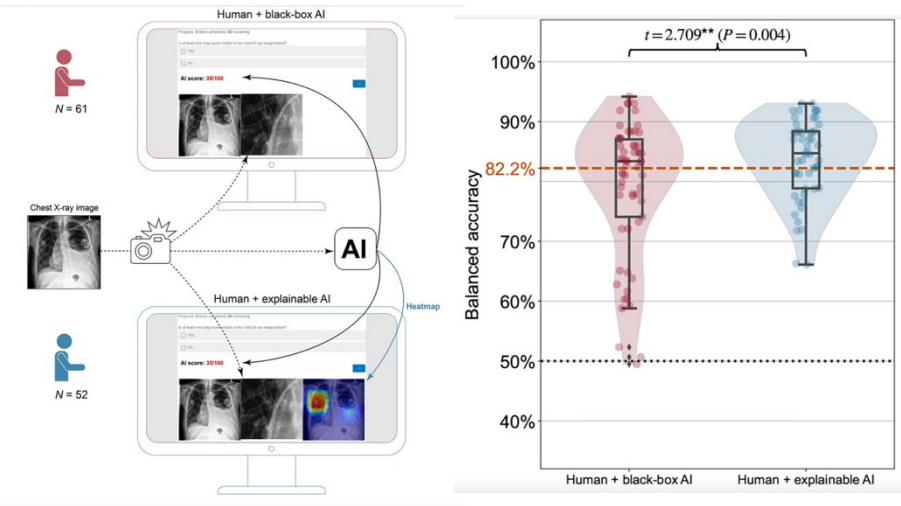


Augmented Human Intelligence - Examples



Legend right: DFU: Diabetic Foot Ulcer,
PG: Pyoderma Gangrenosum, UCx: Ulcus Cruris
Legend right: GRADcam images – above no hit
Below hit

Dorothee A. Busch, Mats L. Richter, Jens Hüters, Mareike Przysucha, Florian Kücking, Jonathan M. Mang, Maurice Moelleken, Joachim Dissemond, Jan Heggemann, Guido Hafer, Carola Berking, Cornelia Erfurt-Berge, and Ursula Hübner
Machine Learning Model to classify chronic leg wounds and identify pyoderma gangrenosum.
BMJ Health and Care Informatics. 2025, in print



Senoner J, Schallmoser S, Kratzwald B, Feuerriegel S, Netland T. Explainable AI improves task performance in human-AI collaboration. Sci Rep. 2024 Dec 28;14(1):31150. doi: 10.1038/s41598-024-82501-9.



Artificial Intelligence – Be Aware and Beware!

AI vs. HI competition

HI: Who is the best and who the worst?

Group	N	Sensitivity	Specificity	Accuracy	p
CNN		0.933	0.876	0.900	
All clinicians	481	0.764	0.830	0.793	n.s.
with formal qualification and self-confidence	160	0.833	0.897	0.863	n.s.
Without format qualification	232	0.706	0.769	0.732	sig.

Automation Bias: Who is a high-risk user?

mean acceptance rate of wrong recommendations
number of participants

Formal qualification yes vs. no	Gender female vs. male	Profession physician vs. nurses	Age ≤ 39 y vs. > 39 y
0.29 0.46	0.34 0.44	0.38 0.39	0.38 0.40
90 120	120 90	133 77	71 139

Kücking F, Hübner UH, Busch D. Diagnostic accuracy differences in detecting wound maceration between humans and artificial intelligence: the role of human expertise revisited. J Am Med Inform Assoc. 2025 Sep 1;32(9):1425-1433. doi: 10.1093/jamia/ocaf116.

Kücking F, Hübner U, Przysucha M, Hannemann N, Kutza JO, Moelleken M, Erfurt-Berge C, Dissemmond J, Babitsch B, Busch D. Automation Bias in AI-Decision Support: Results from an Empirical Study. Stud Health Technol Inform. 2024 Aug 30;317:298-304. doi: 10.3233/SHTI240871.



4.3 billion for hospitals to upgrade their IT since 2021

Correlation Population – Sample: **0.89**
Correlation Priority – Completion: **-0.46**

Hübner et al. IT-Report Healthcare 2025



Trend over the last 8 years in % of hospitals with full adoption: view of clinicians



Trend over the last 8 years in % of hospitals with full adoption in all relevant units



Hübner et al. IT-Report Healthcare 2025, 2024, 2020



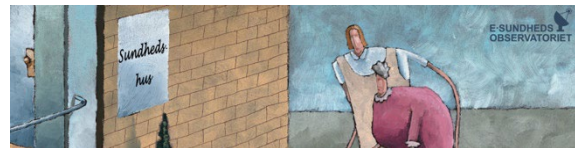
Internal Electronic Patient Record



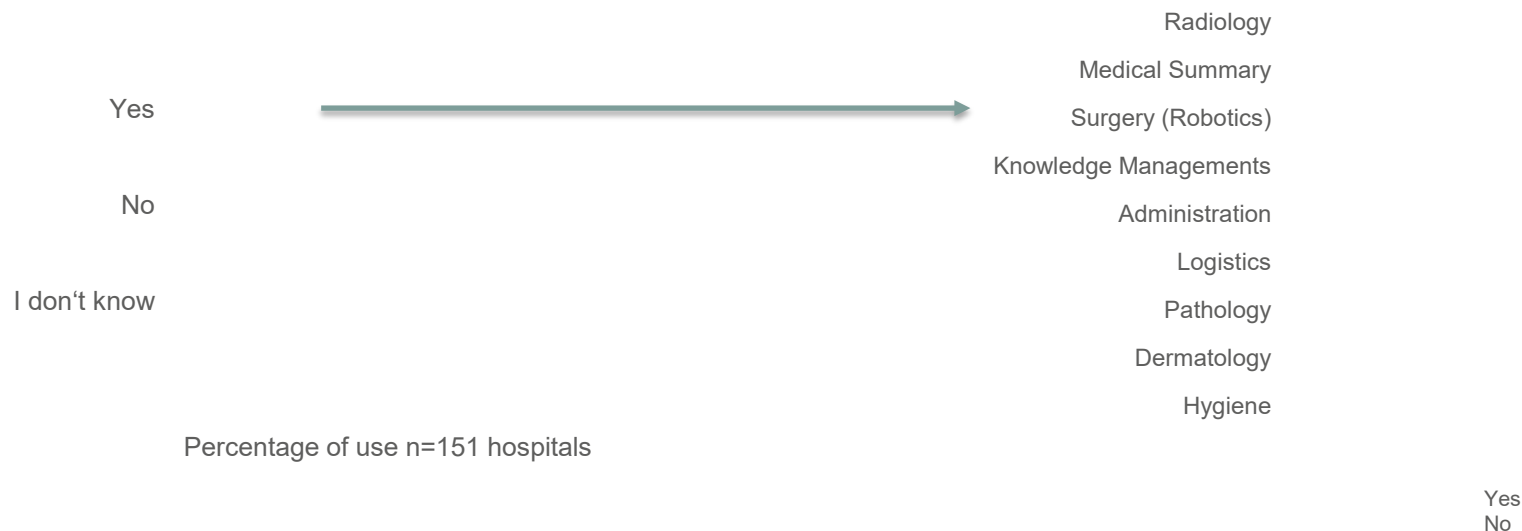
Legend: on a scale from 1 (very low) to 10 (very high)

Hübner et al. IT-Report Healthcare 2025, 2024, 2020

Esdar M, Hüsters J, Weiß JP, Rauch J, Hübner U. Diffusion dynamics of electronic health records: A longitudinal observational study comparing data from hospitals in Germany and the United States. Int J Med Inform. 2019 Nov;131:103952. doi: 10.1016/j.ijmedinf.2019.103952.



AI Applications in German Hospitals: clinicians' view





European Health Data Space: Germany

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European Health Data Space: Germany – the Players

- **BfArM** - Federal Institute for Drugs and Medical Devices (Bundesinstitut für Arzneimittel und Medizinprodukte): National Contact Point and is cooperation partner in the project Xt-EHR (Extended EHR) for the requirement analysis and development of logical models
- **gematik** – political level and responsible for the German Health Telematics Infrastructure and for the interoperability within the ePA – the *German Electronic Health Record (ePA)*. The idea is to get connected to the EHDS via the ePA.
- **mio42 GmbH** (daughter company of the Federal GP Association) no official role but submitted successfully implementation guidelines in HL7 EU, e.g. Lab Results. Mio42 provides standardised *Medical Information Objects (MIO)* for the ePA.



A warm welcome to Osnabrück at EFMI STC 2025



Osnabrück, Lower Saxony, Germany



Osnabrück University AS Caprivi Campus



Thank you!



Real stupidity beats artificial intelligence every time
Terry Pratchett Hogfather

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