



Painting: Sarina Walter

Audit, Don't Explain – Recommendations Based on a Socio-Technical Understanding of ML- Based Systems

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research

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 **University
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YouTube

2+ billion users
(YouTube, 2020)

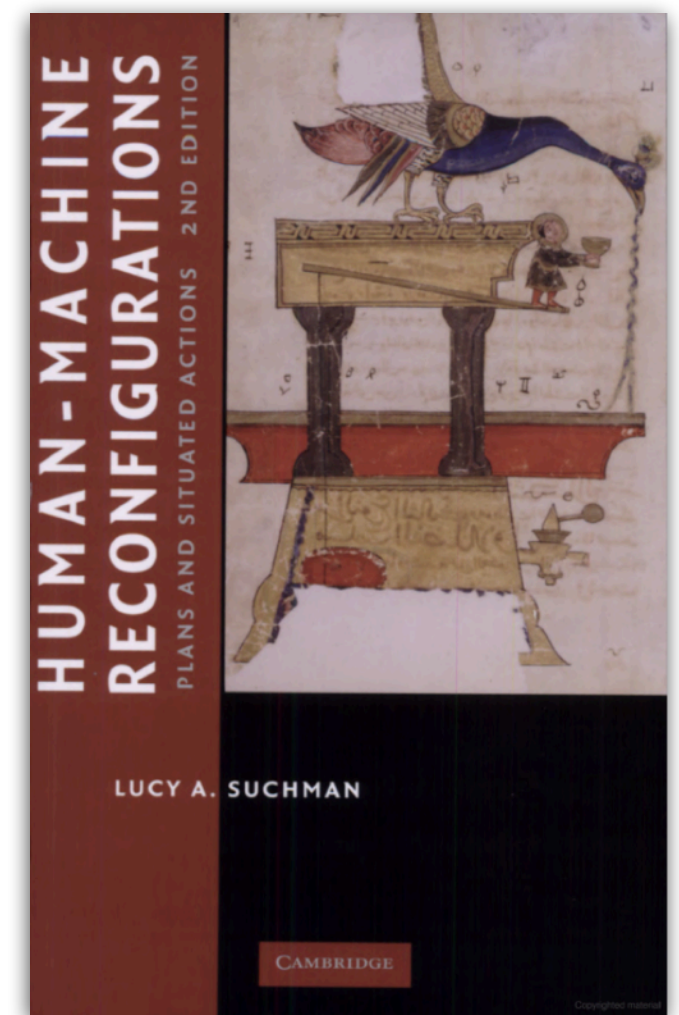
70% of videos watched on
YouTube are recommended by an
ML system (Solsman, 2018)

27% of people worldwide use
YouTube as a news source
(Newman et al., 2019)

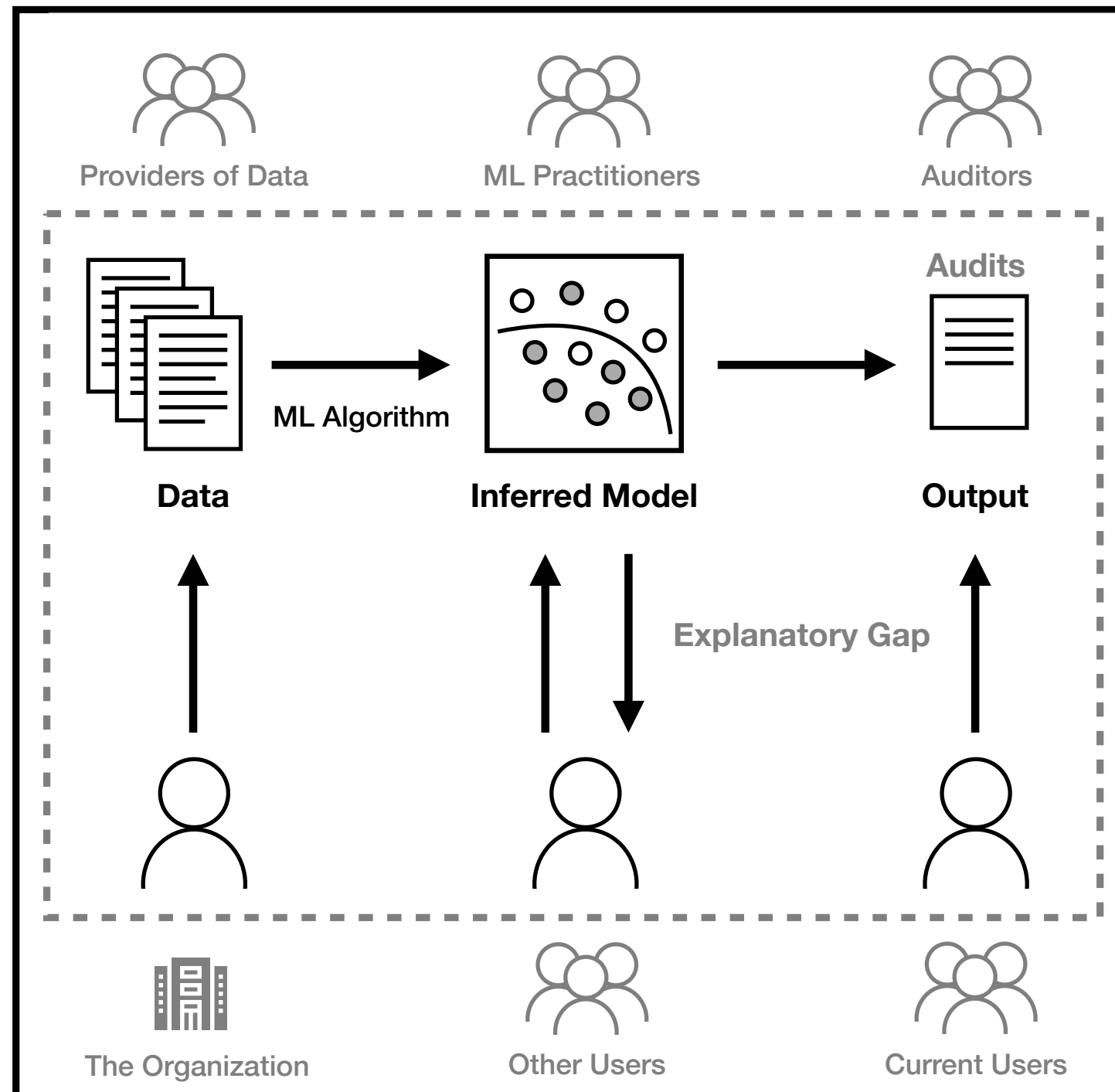


Human-Computer Interaction

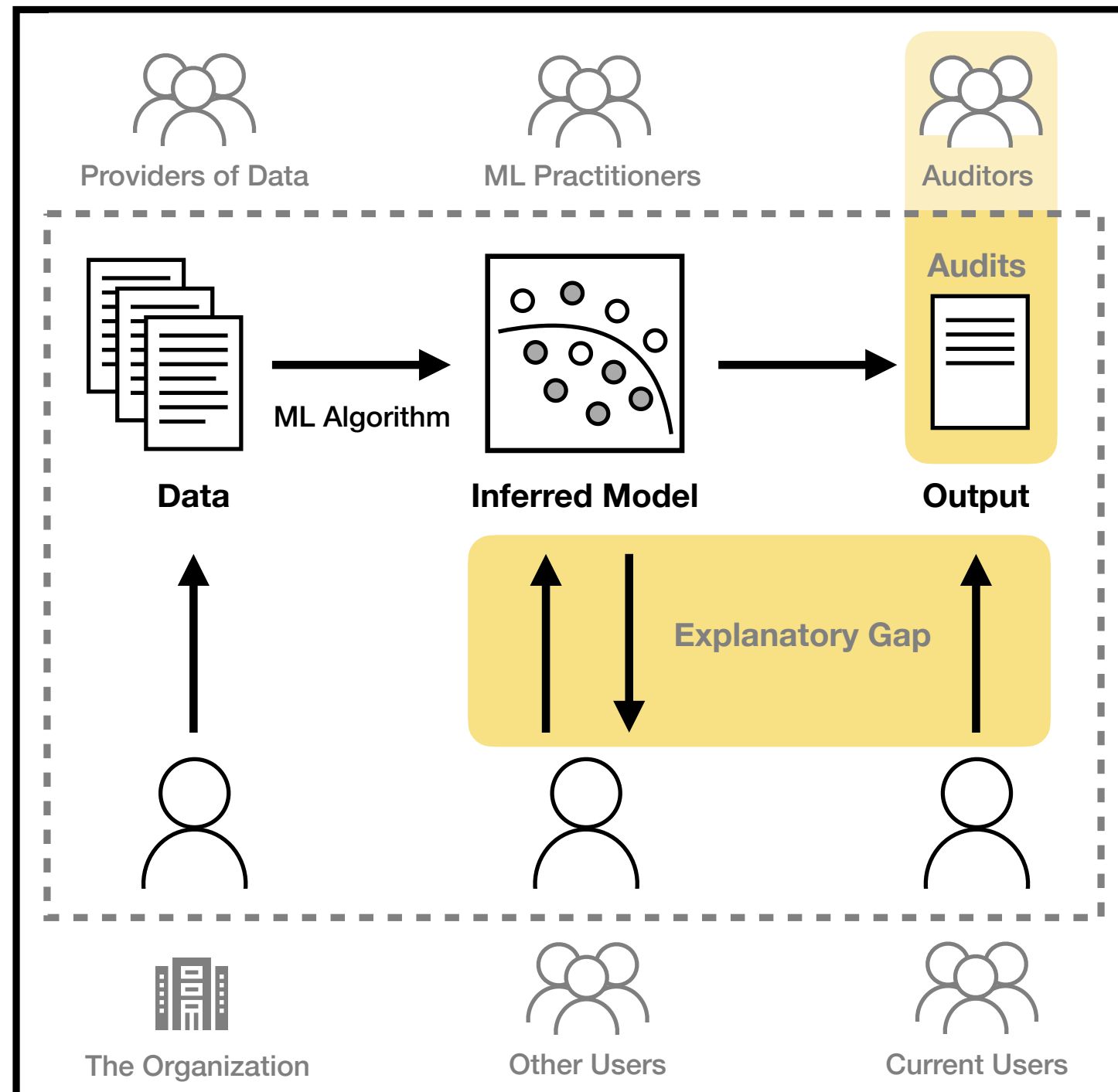
- "**Radical asymmetries** in relative **access** of user and machine **to contingencies of the unfolding situation** [which] profoundly **limit possibilities for interactivity**"
- Suchman (2007)
- I want to discuss the **agencies** and **attendant responsibilities** in the context of ML-based curation systems



A Socio-Technical Perspective of Machine Learning



A Socio-Technical Perspective of Machine Learning



Auditing the Biases Enacted by YouTube for Political Topics in Germany

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ANDREAS BREITER, University of Bremen, Institute for Information Management & Centre for Media, Communication and Information Research (ZeMKI), Germany

YANNIS THEOCHARIS, Technical University of Munich, School of Governance/Bavarian School of Public Policy, Germany

With YouTube's growing importance as a news platform, its recommendation system came under increased scrutiny. Recognizing YouTube's recommendation system as a broadcaster of media, we explore the applicability of laws that require broadcasters to give important political, ideological, and social groups adequate opportunity to express themselves in the broadcasted program of the service. We present audits as an important tool to enforce such laws and to ensure that a system operates in the public's interest. To examine whether YouTube is enacting certain biases, we collected video recommendations about political topics by following chains of ten recommendations per video. Our findings suggest that YouTube's recommendation system is enacting important biases. We find that YouTube is recommending increasingly popular but topically unrelated videos. The sadness evoked by the recommended videos decreases while the happiness increases. We discuss the strong popularity bias we identified and analyze the link between the popularity of content and emotions. We also discuss how audits empower researchers and civic hackers to monitor complex machine learning (ML)-based systems like YouTube's recommendation system.

CCS Concepts: • **Human-centered computing** → **Human computer interaction (HCI)**; User studies; • **Information systems** → *Recommender systems*.



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Audit, Don't Explain

The Explanatory Gap in Algorithmic News Curation

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Abstract. Considering the large amount of available content, social media platforms increasingly employ machine learning (ML) systems to curate news. This paper examines how well different explanations help expert users understand why certain news stories are recommended to them. The expert users were journalists, who are trained to judge the relevance of news. Surprisingly, none of the explanations are perceived as helpful. Our investigation provides a first indication of a gap between what is available to explain ML-based curation systems and what users need to understand such systems. We call this the Explanatory Gap in Machine Learning-based Curation Systems.

Keywords: Algorithmic Transparency, Algorithmic Experience, Recommender System, Algorithmic News Curation, Machine Learning



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The 3rd Multidisciplinary
International Symposium on
Disinformation in Open Online
Media



MISDOOM
OXFORD 2021

The Explanatory Gap in Algorithmic News Curation

- examines how well different **explanations** help expert users understand why certain news **stories** are recommended to them

System Predictions

Correctly predicted as interesting (3)	
1.	Naturwald in Deutschland: Regierung verfehlt wohl Vorgabe Bis 2020 sollen fünf Prozent der Waldfläche in Deutschland für (...)
2.	Der Tag kompakt: Das soziale Abschiebungspaket Das Geordnete-Rückkehr-Gesetz ist beschlossen ++ Linda Teuteberg soll FDP (...)
3.	Nach Anschlägen in Sri Lanka: Wie sich Touristen verhalten sollten Nach derzeitigem Stand sind deutsche Urlauber unverse (...)
Correctly predicted as uninteresting (4)	
1.	Revierderby BVB vs. Schalke - Wie geht's aus? Am Samstag steht der große Revierschlager zwischen Borussia Dortmund und de (...)
2.	Letzter Tatort mit Postel und Mommsen: Zum Abschied eine Heroinspritze voll Irrsinn Stedefreund im Rachemodus

Performance Metrics

In total, you have rated 36 messages. Of these, 28 messages were randomly selected to train the system. The remaining 8 messages were used to calculate the information displayed here.

The system you trained assigned 87.50% of the messages correctly.

Precision score: 100.00%. The percentage indicates how many of the messages predicted as relevant were relevant.

Recall score: 75.00%. The percentage indicates how many of the relevant messages were predicted by the system.

Influential Keywords

01. jahrbuch	schwach	mäßig	stark
02. usa	schwach	mäßig	stark
03. wochenend	schwach	mäßig	stark
04. mitgliedschaft	schwach	mäßig	stark
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14. malen	schwach	mäßig	stark
15. regeln	schwach	mäßig	stark

The Explanatory Gap in Algorithmic News Curation

Buchmacher-Quoten für Brexit-Votum: May fällt durch. Wetten, dass...?

Wer wissen will, wie die Briten ticken, muss in den Wettbüros nach den Einsätzen fragen. Das gilt auch für das mit Spannung erwartete Brexit-Vote am Abend im Parlament. Für Theresa May sieht es nicht gut aus.

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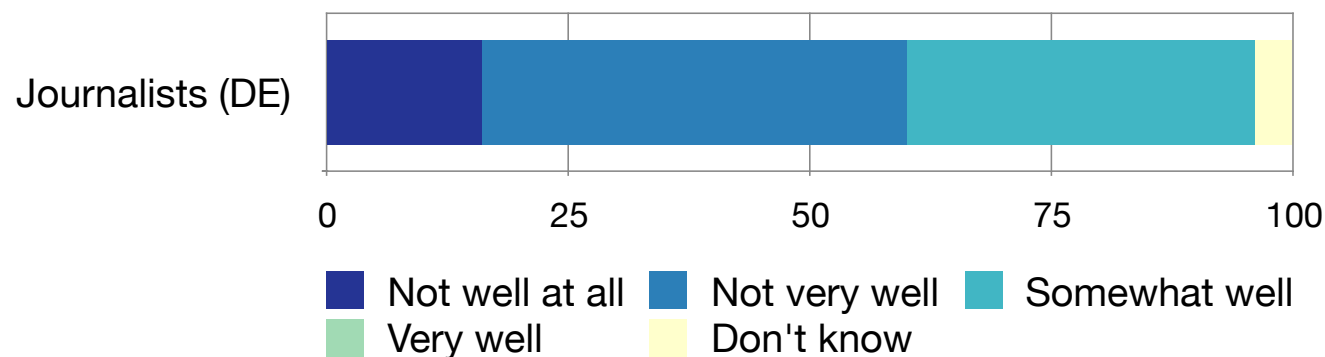
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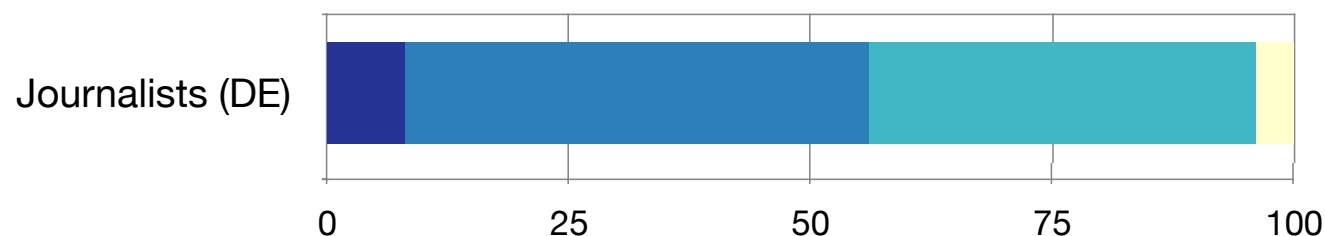
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The Explanatory Gap in Algorithmic News Curation

How much, if at all, do you feel you understand why certain posts are included by the system in this experiment and others are not?



How much, if at all, do you feel you understand why certain posts are included by Facebook and others are not?



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Explanatory Gap between what is available to explain ML-based Curation Systems and **what users need** to understand such systems

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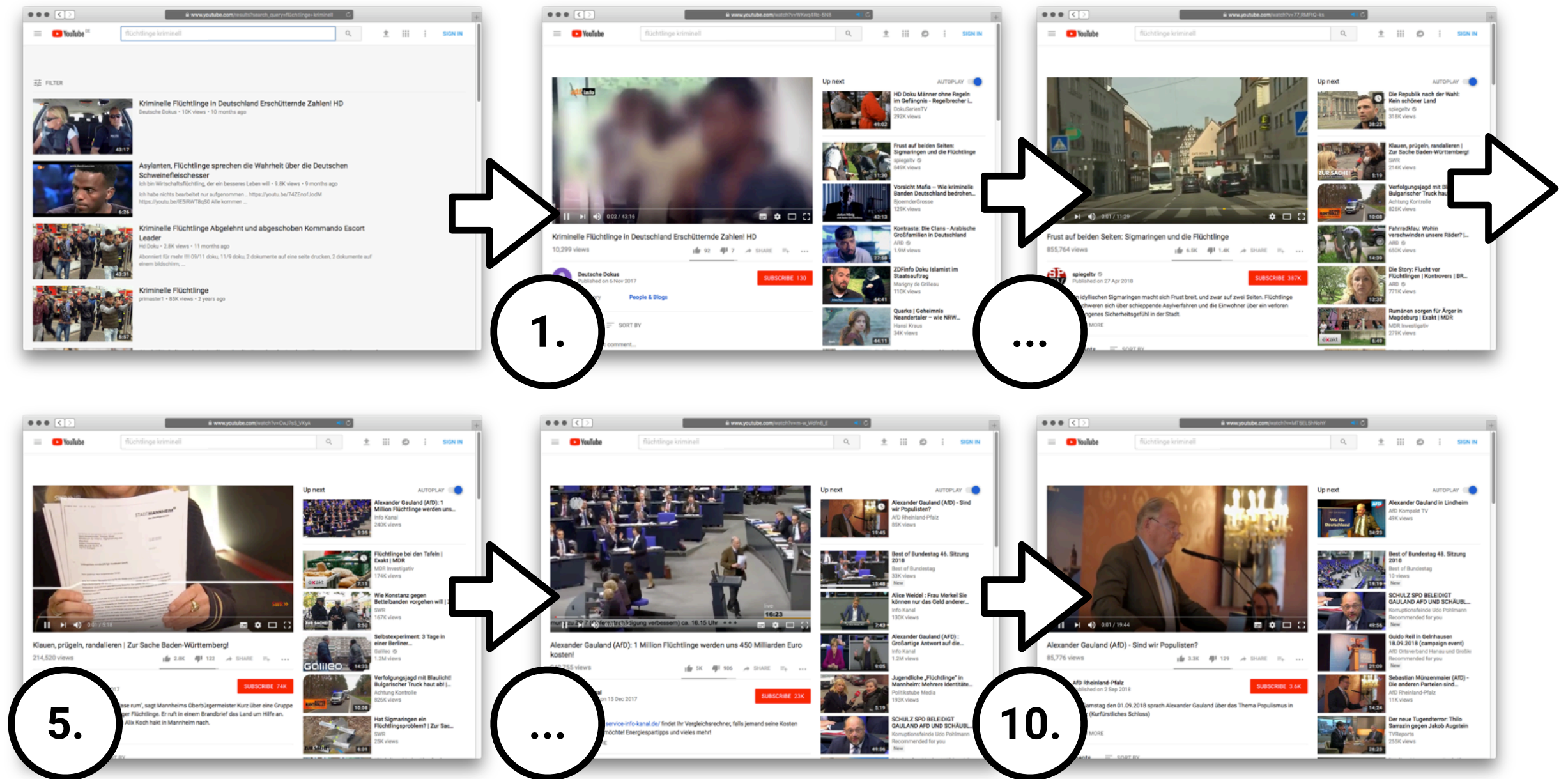
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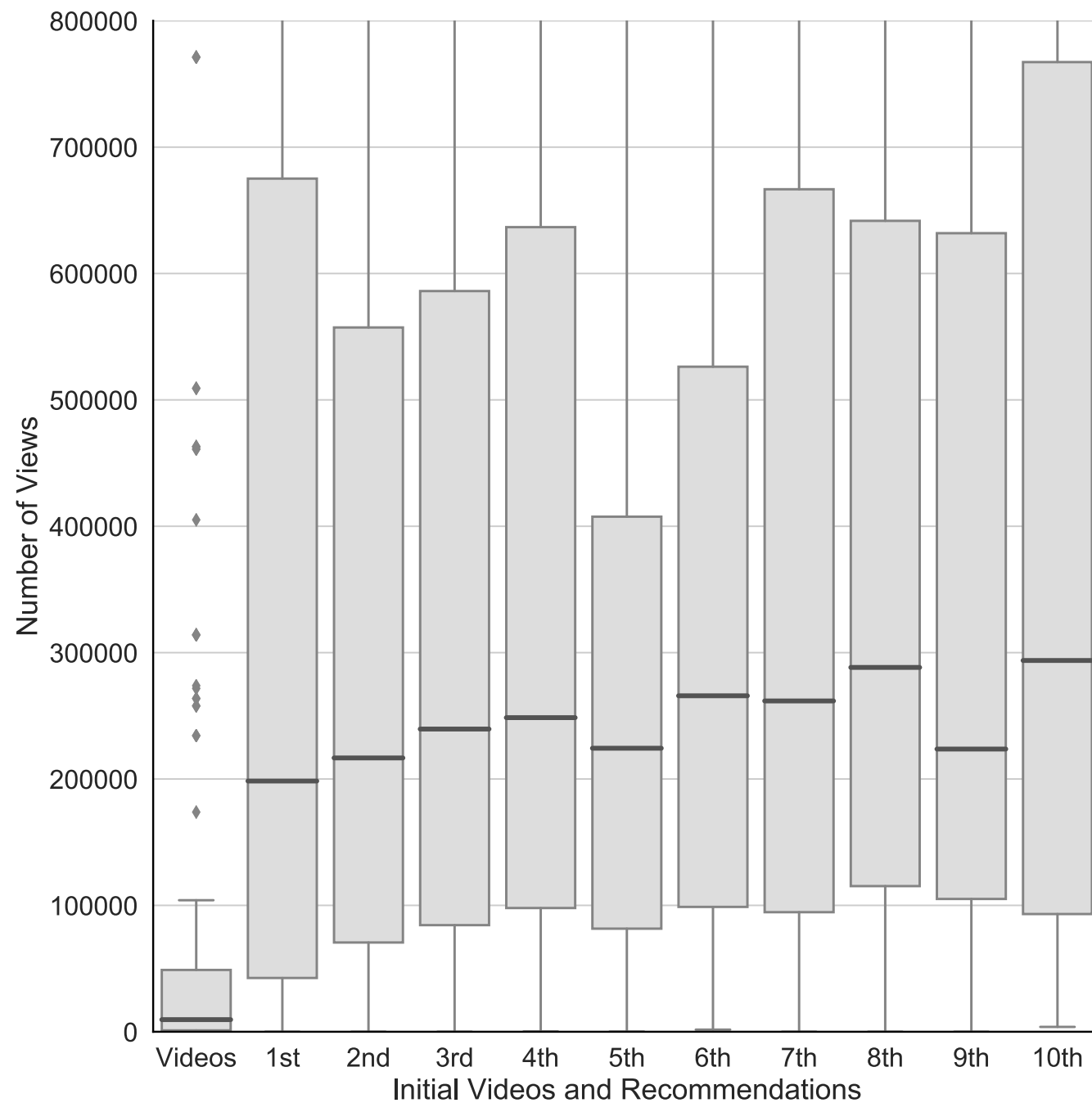


Auditing the Biases Enacted by YouTube for Political Topics in Germany

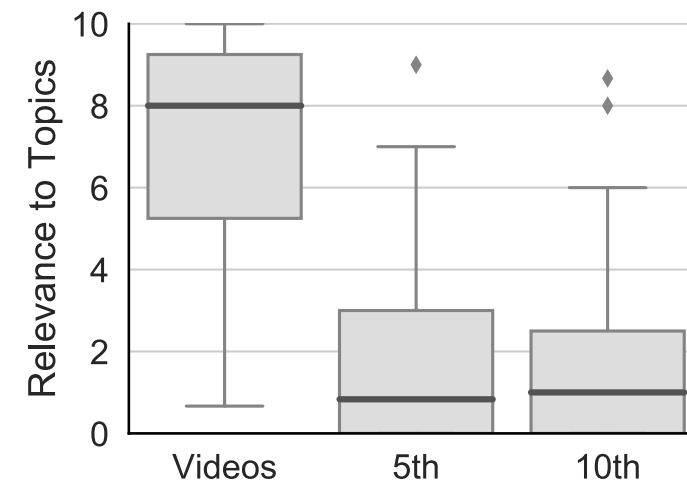


Heuer, H.¹, Hoch, H.², Breiter, A.², Theocharis, Y.². 2021. Auditing the Biases Enacted by YouTube for Political Topics in Germany. Mensch & Computer (September 2021). ¹ Konzeption und Ausführung, ² Feedback

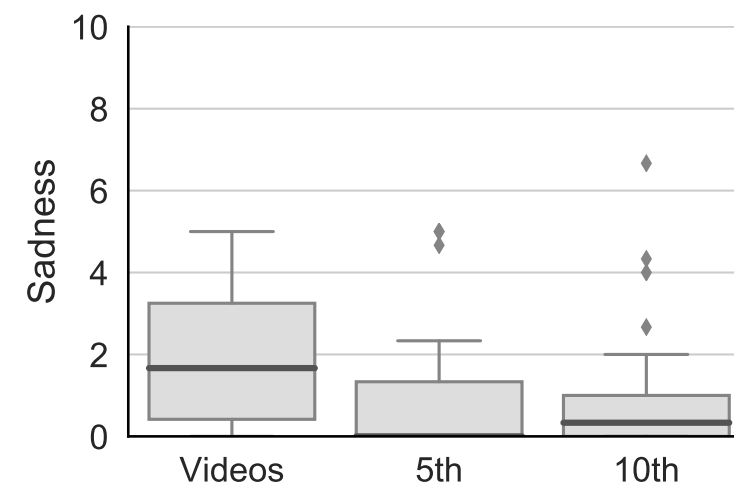
2019 YouTube Audit



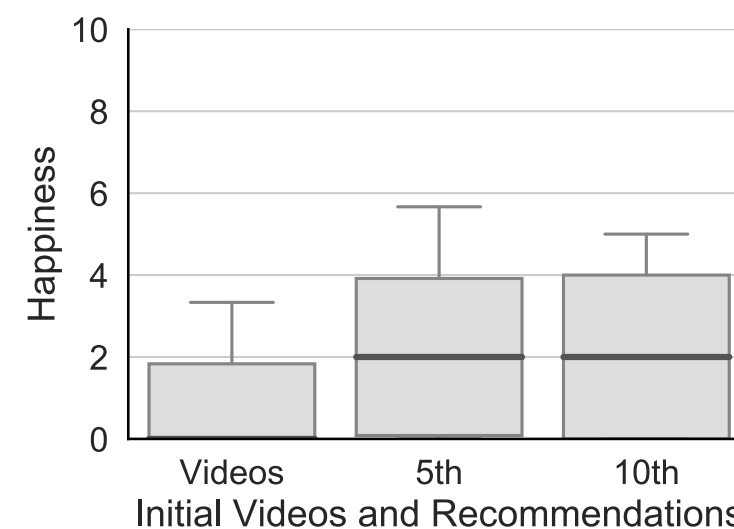
significantly more views and likes



**less
political
topics**



**less
sad
videos**



**more
happy
videos**



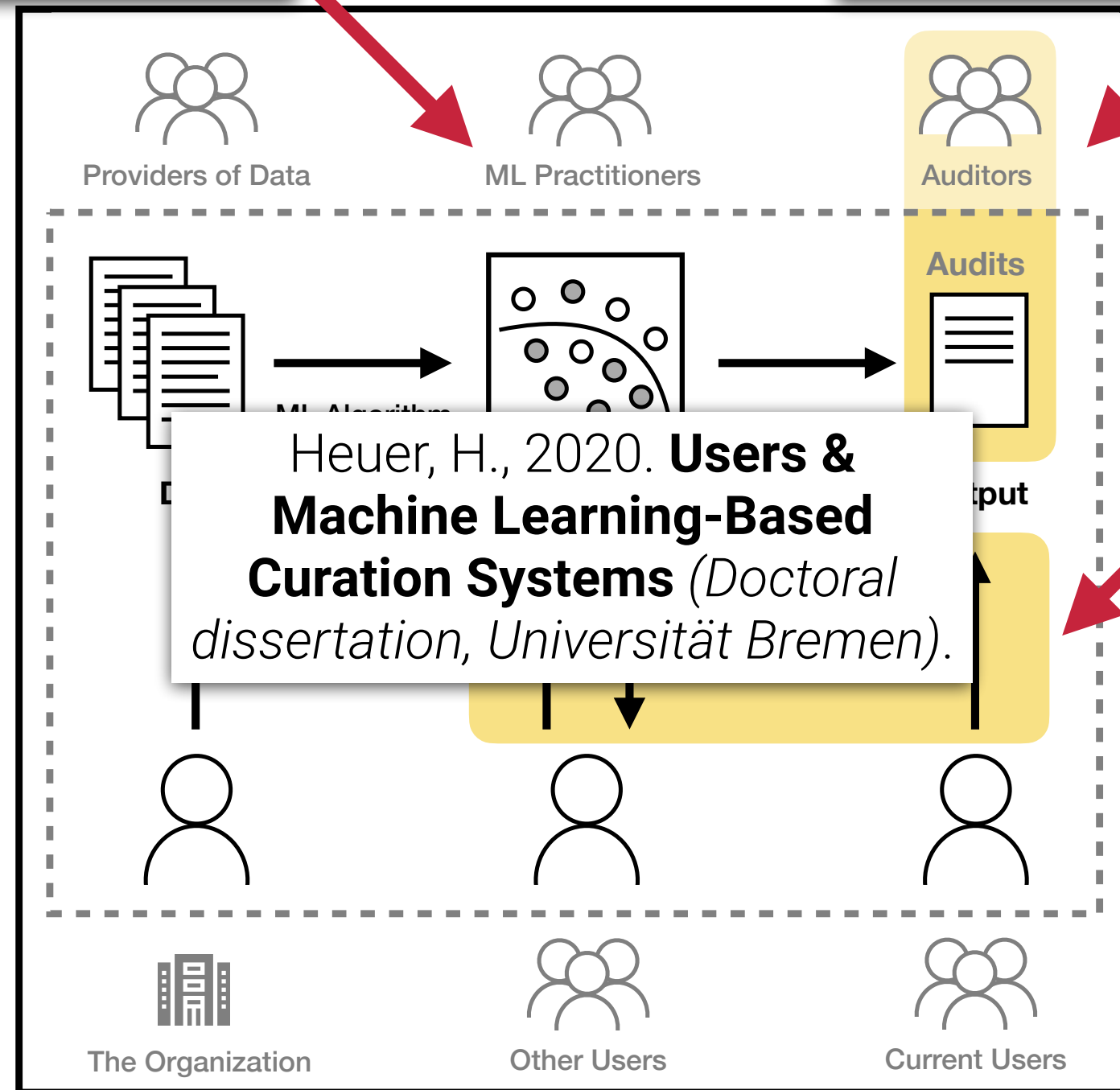
Video: Yaroslav Shuraev (Pexels)

My Position

- **Goal:** Ensure that ML systems act in the interest of the democratic common good
- **Solution: Institutions under public law** analogous to TÜV and Stiftung Warentest
 - which **perform audits to understand** where **systems** meets requirements and where improvements are needed

Heuer, H., Jarke, J. and Breiter, A., 2021. **Machine learning in tutorials–Universal applicability, underinformed application, and other misconceptions.** *Big Data & Society*.

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Acknowledgements



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Harvard University



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Thank You for Your Attention!

References

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