

Deep Recommendations: Future Directions

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Tutorial website: <https://advanced-recommender-systems.github.io/ijcai2021-tutorial/>

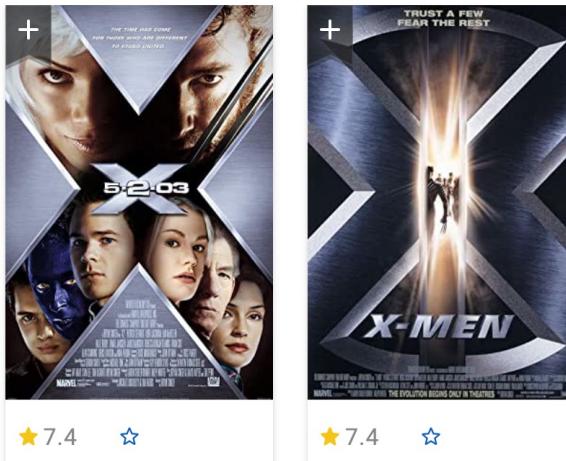
Recommender System is Everywhere



Business



Healthcare



Entertainment



Education



Trustworthy Recommender Systems



Privacy



Safety
& Robustness



Explainability



Non-discrimination
& Fairness



Accountability
& Auditability

Privacy Issue



- ❑ The success of recommender systems heavily relies on data that might contain private and sensitive information.

- ❑ Can we still take the advantages of data while effectively protecting the privacy?

Explainability Issue

How recommender systems work?

Today

					...	
	5	4	?	?	?	?
	?	?	5	...	?	?
...				...		
	5	?	\hat{r}_{ij}	...	5	1
	?	?	?	...	2	5

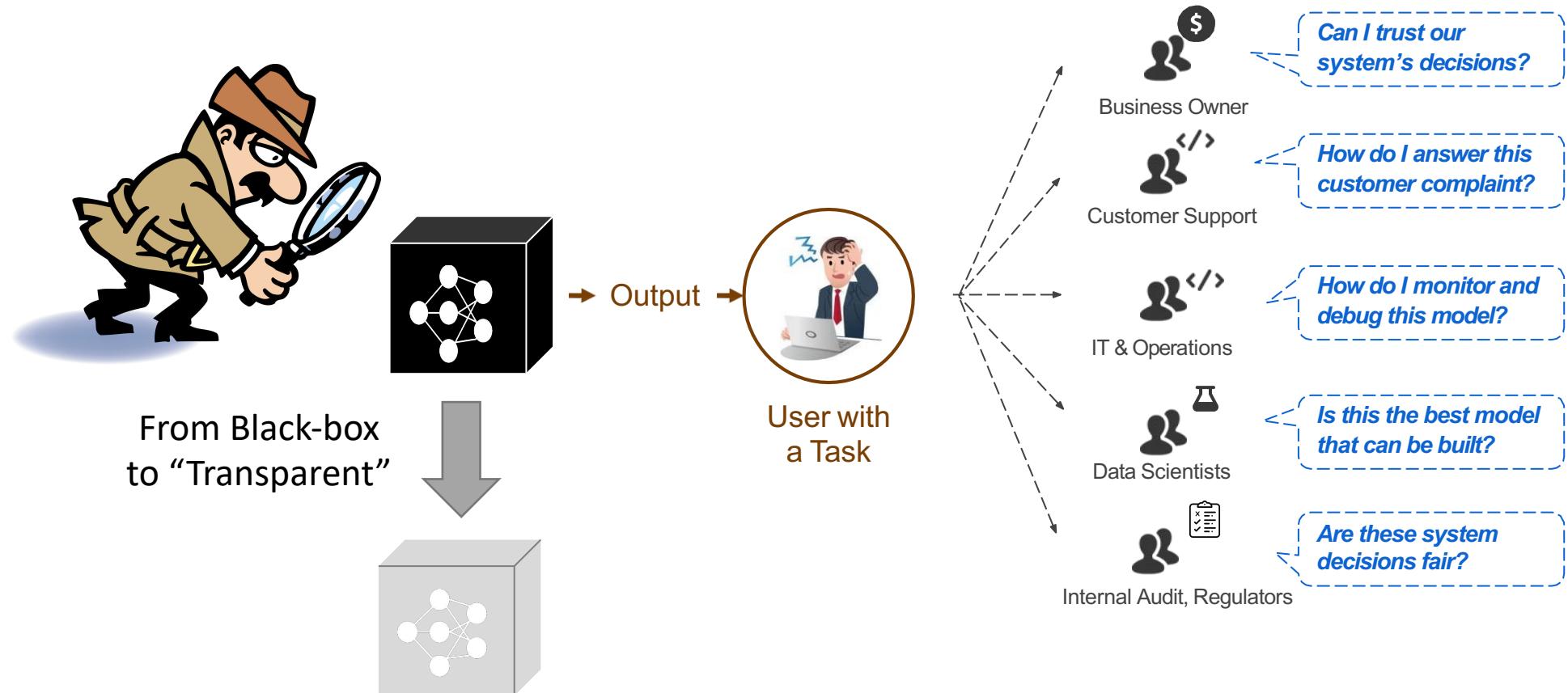
Training Data



- Why did you do that?
- Why not something else?
- When do you succeed?
- When do you fail?
- When can I trust you?
- How do I correct an error?

Explainability Issue

Black-box AI creates confusion and doubt

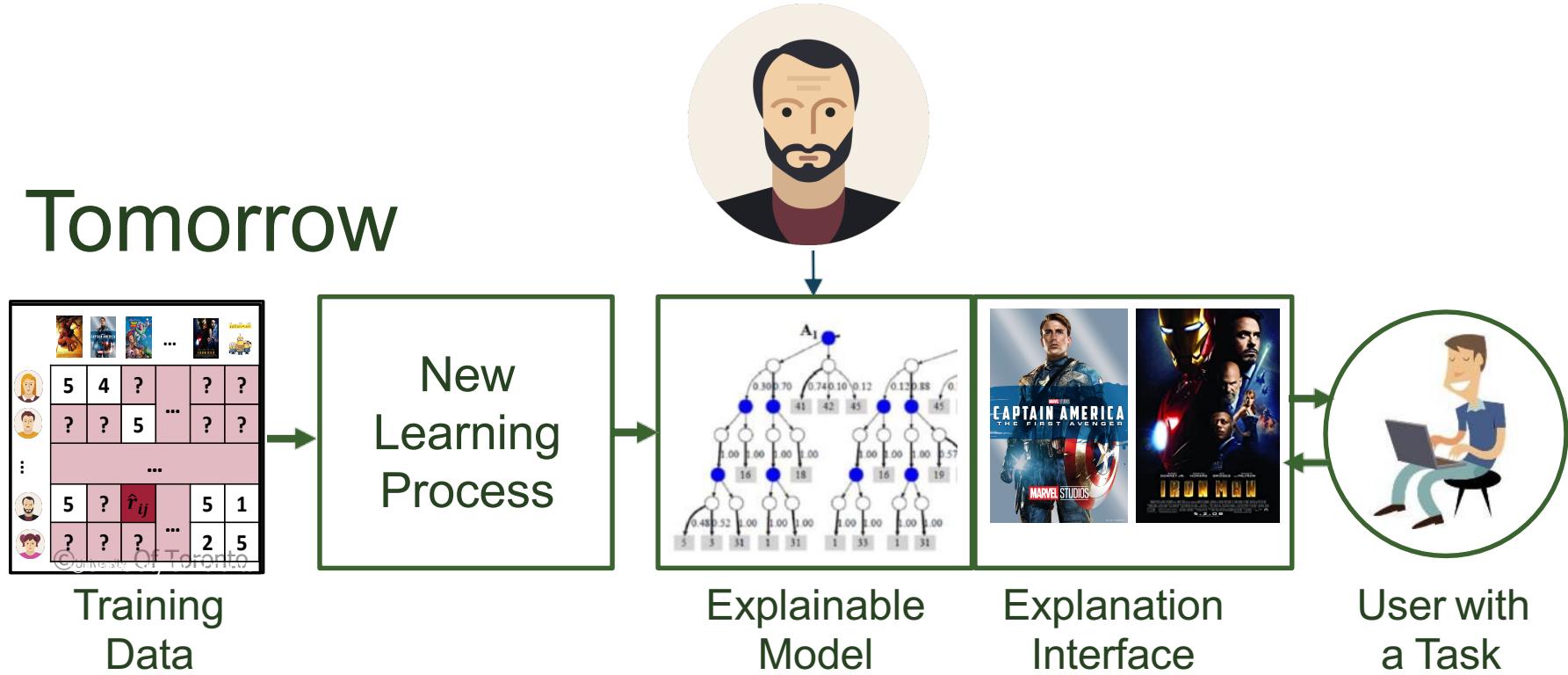


The Need for Explainable Recommendation

Explainability Issue



Tomorrow



- I understand why
 - I understand why not
 - I know when you'll succeed
 - I know when you'll fail
 - I know when to trust you
 - I know why you erred

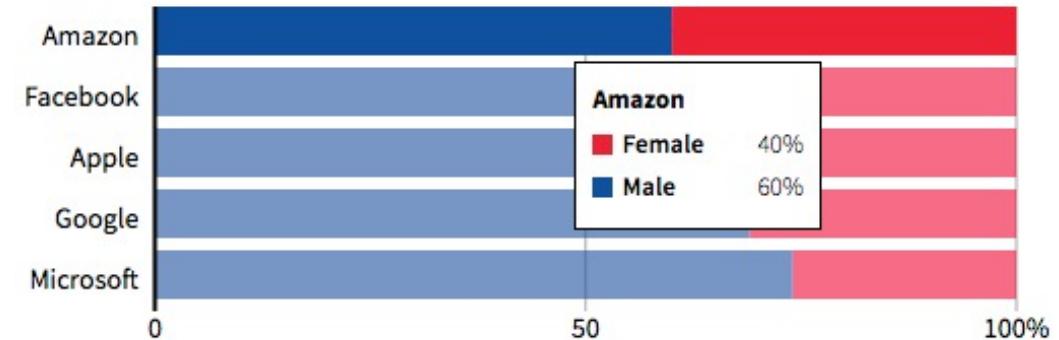
Discrimination & Fairness Issue



Job recommendation
(Lambrecht et al., 2019)

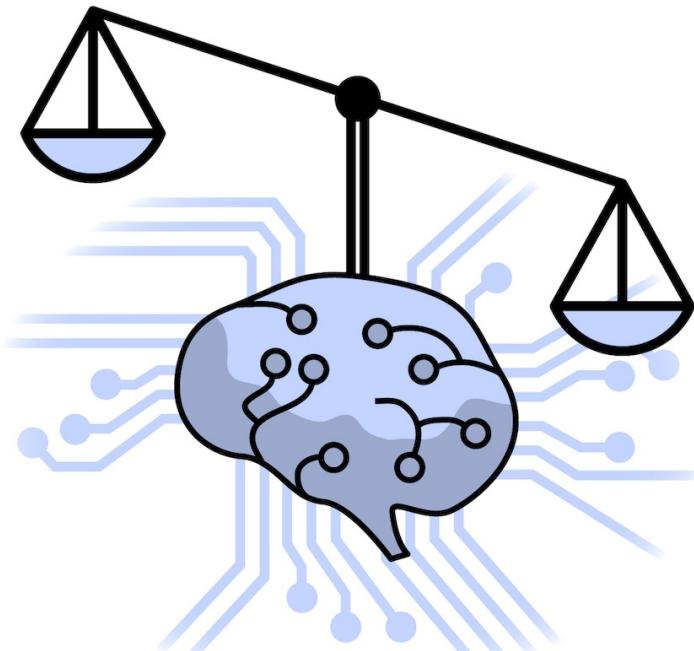
GLOBAL HEADCOUNT

■ Male ■ Female

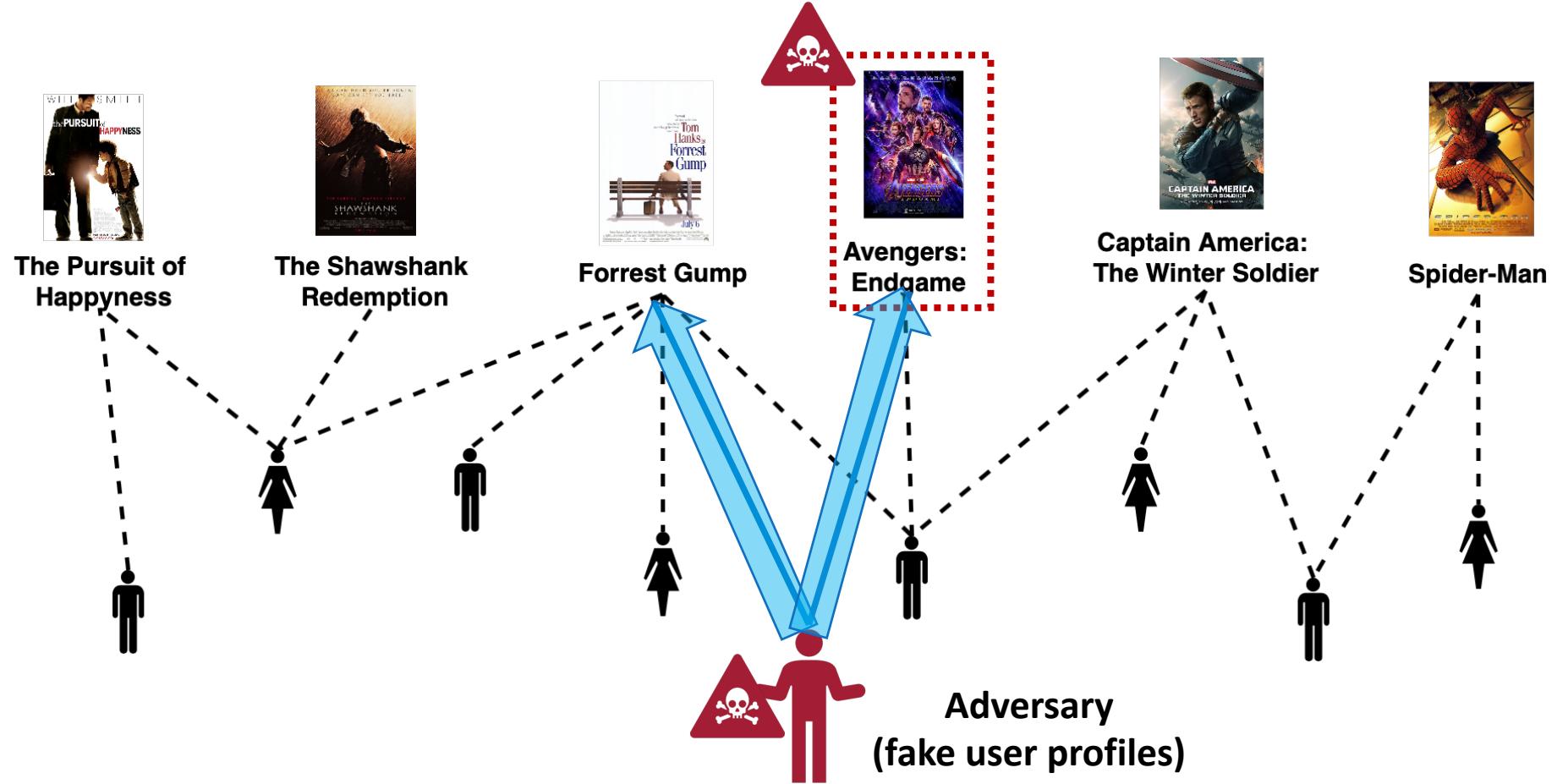


Non-discrimination & Fairness

- A recommender system should avoid discriminatory behaviors in human-machine interaction.
- A recommender system should ensure fairness in decision-making.

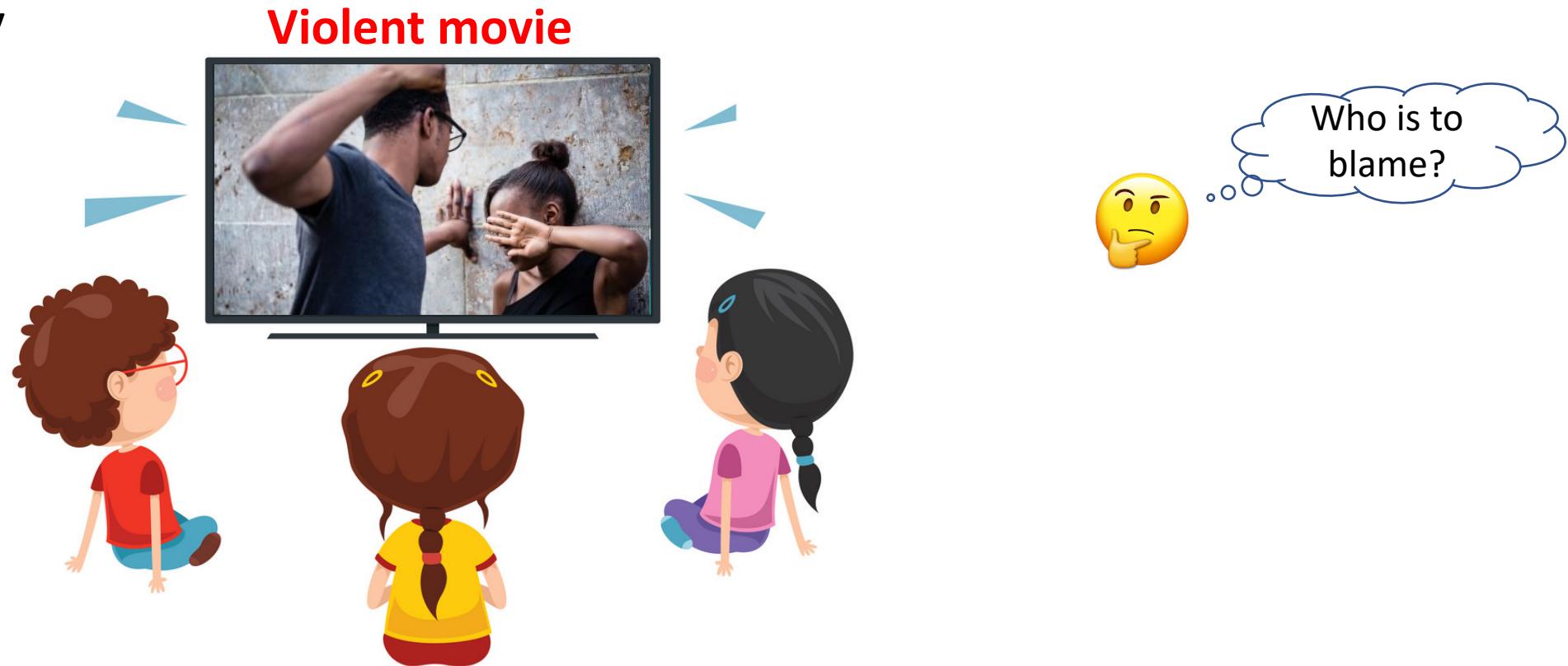


Safety & Robustness Issue



Auditability & Accountability

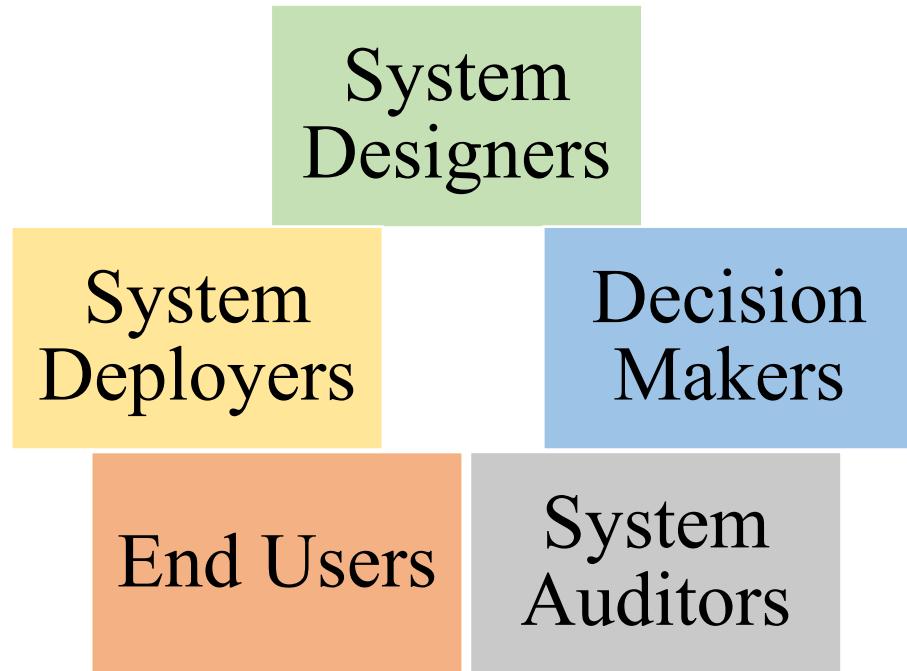
■ Accountability



Accountability: A clear responsibility distribution, which focuses on who should take the responsibility for what impact of recommender systems.

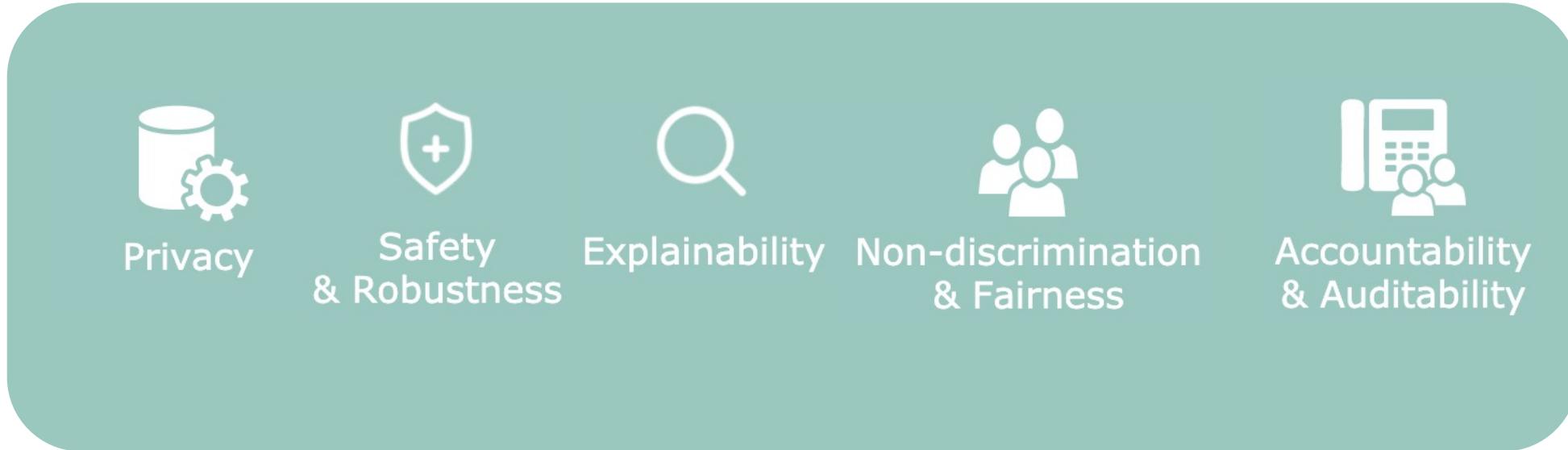
Auditability & Accountability

- Five roles in Recommender Systems



It is necessary to determine the roles and the corresponding responsibility of different parties in the function of a recommender system.

Interactions Among Different Dimensions



How do these five dimensions influence each other?

There exist both **accordance** and the **conflicts** among the five dimensions.

A Survey on The Computational Perspective



Trustworthy AI: A Computational Perspective

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<https://arxiv.org/abs/2107.06641>

Tutorial website: <https://sites.google.com/msu.edu/trustworthy-ai/home>

Acknowledgements

Thanks for this great opportunity offered by IJCAI 2021 and our funding support from MSU, AERA, NSF, ARO, DARPA, NSFC, GRF, and industrial collaborators.

