1

Investigating Popularity Bias Amplification in Recommender Systems Employed in the Entertainment Domain
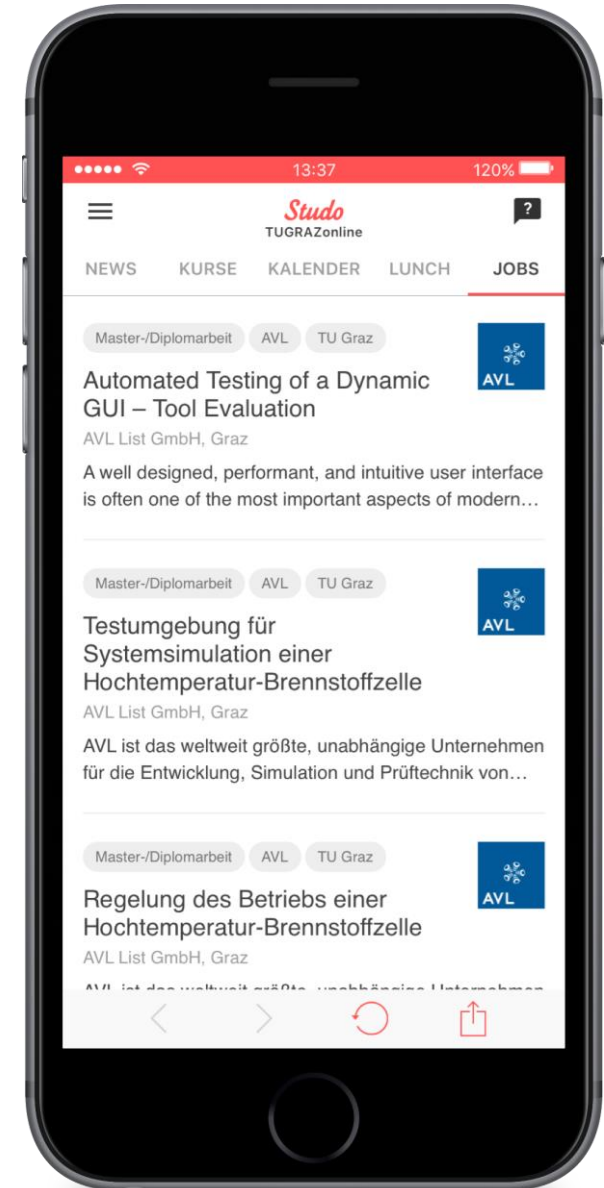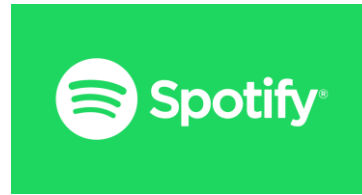
Dominik Kowald

Know Center Research GmbH & TU Graz, Austria

July 1st, 2025

Eindhoven, The Netherlands

2

Recommender Systems

- Recommender systems (RecSys) →
integral part of online experience
  - **Analyze** past usage behavior to build
user models and **suggest** new content
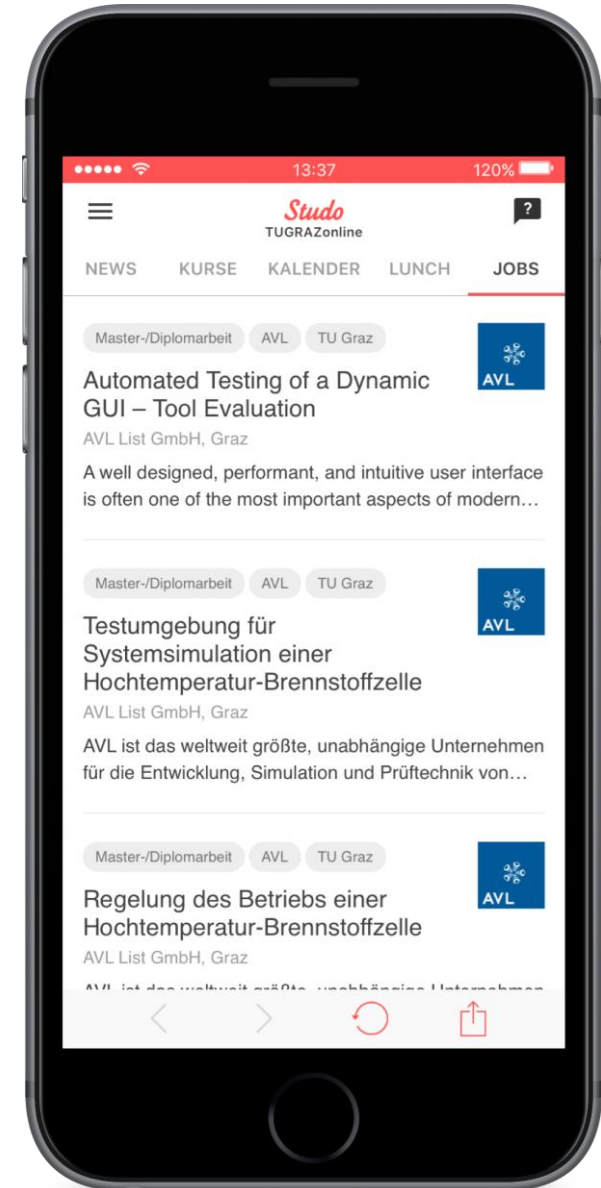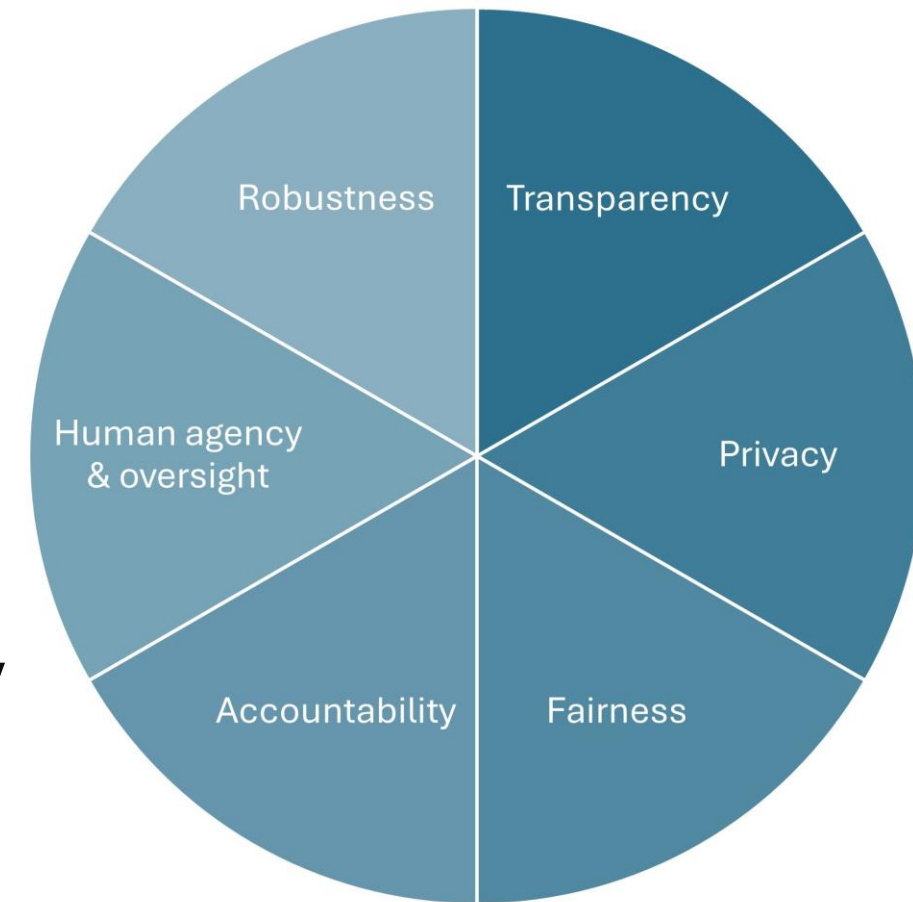
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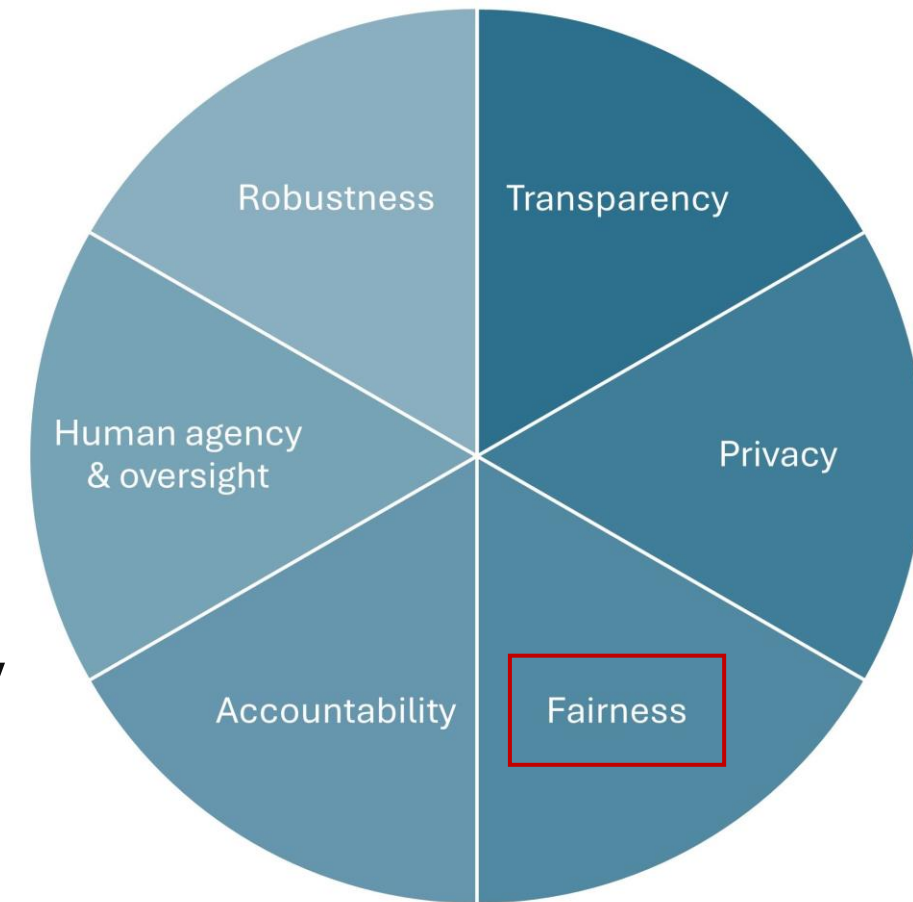
4

Why Fairness and Popularity Bias?

- Among most widely used **applications of AI, data science,** and **machine learning**
    - **User-centric nature with societal impact** → humans directly interact with / are affected by RecSys

- **Regulations** and **requirements of Trustworthy AI** relevant for design of RecSys (e.g., AI Act)
    - **Transparency**
        - Explainable design and decisions of algorithms
    - **Privacy**
        - Responsible usage and protection of users' data
    - **Fairness**
        - Detect and prevent potential discrimination of users

1. Kowald, D. et al. (2024). Establishing and Evaluating Trustworthy AI: Overview and Research Challenges. *Frontiers in Big Data and AI.*
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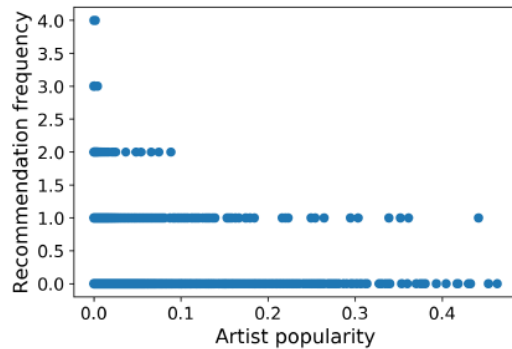# Why Fairness and Popularity Bias?

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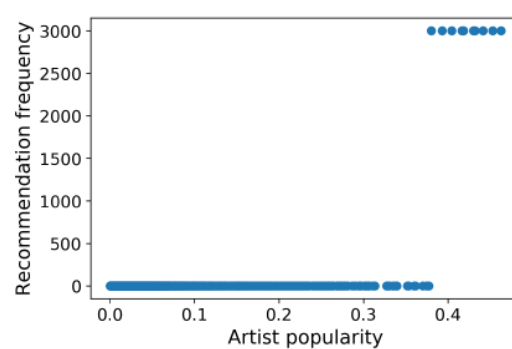   - Detect and prevent potential discrimination of users

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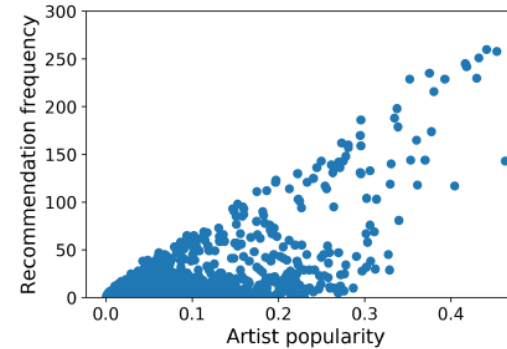
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Fairness & Popularity Bias in RecSys
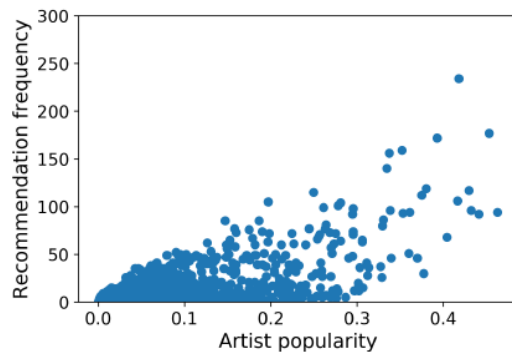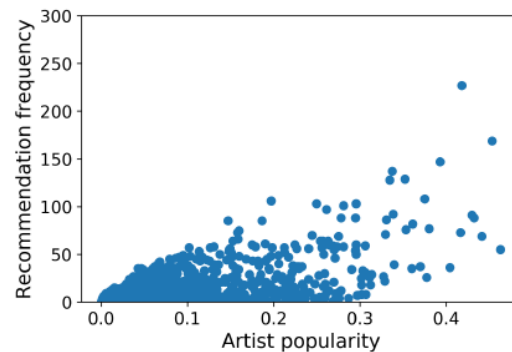
(Music RecSys)
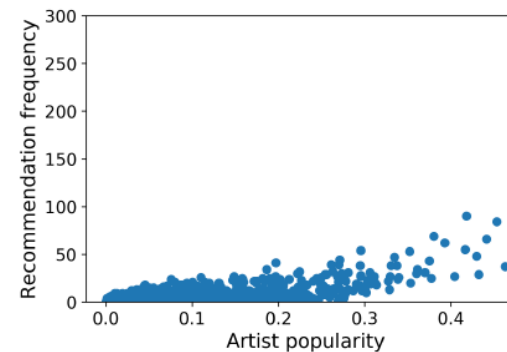

(a) Random.

(b) MostPopular.

(c) UserItemAvg.

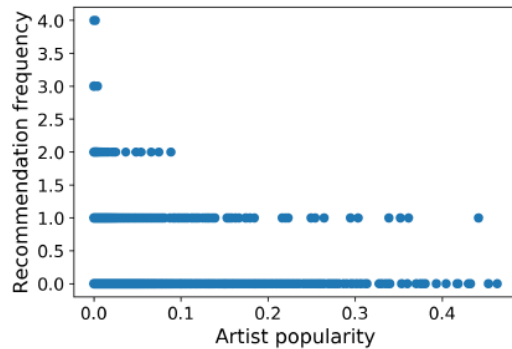(d) UserKNN.

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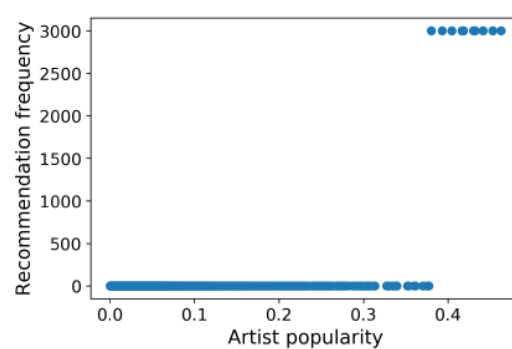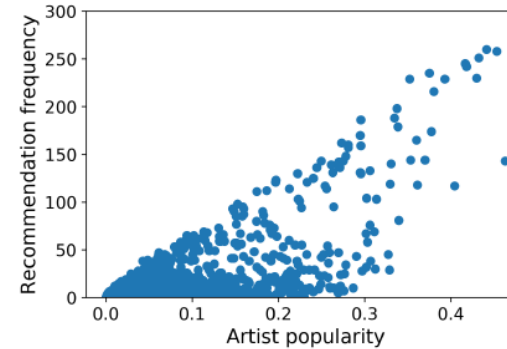
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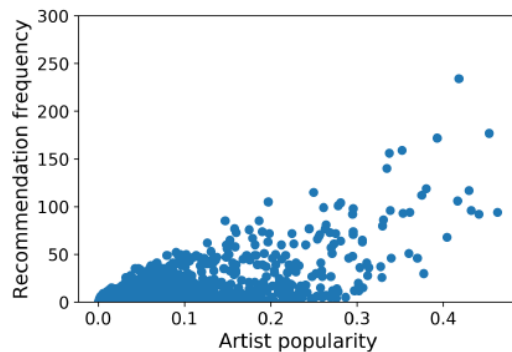
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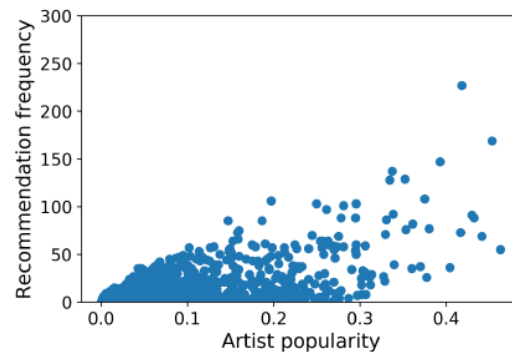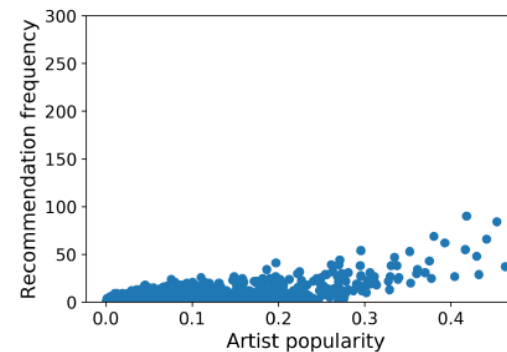

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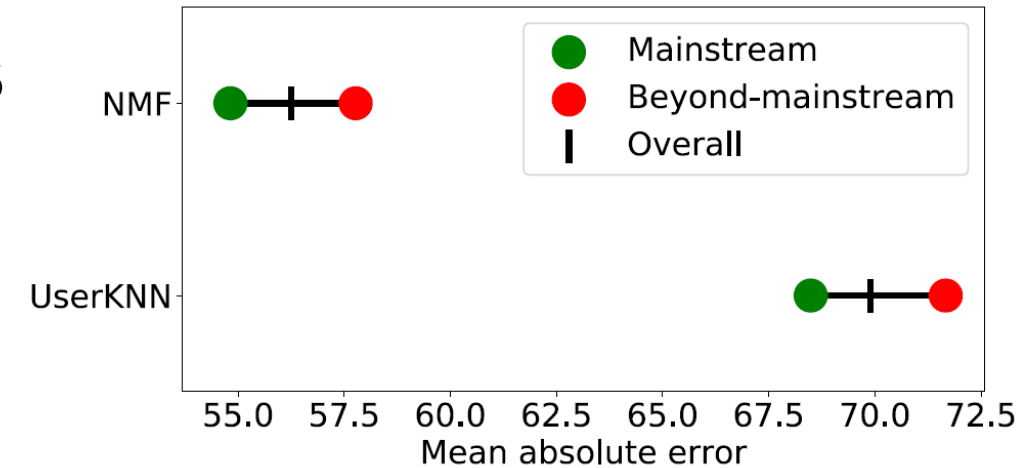(b) MostPopular.

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Thank you for listening!

Questions? Comments? Want to collaborate?

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- Scholar: *https://scholar.google.at/citations?user=qQ-L8rUAAAAJ&hl=en*
- GitHub: *https://github.com/domkowald/*