Recommender Systems Privacy and Ethical issues

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Legal, Privacy and Ethical issues

"As data science, analytics, cognitive computing, and AI grow in reach and pervasiveness, everyone may be affected by these applications. Just because something is doable through technology does not make it appropriate, legal, or ethical. Data science and AI professionals and managers have to be very aware of these concerns."

Sharda, Delen and Turban, 2020

◦ Legality vs Privacy vs Ethics

◦ Something legal may not be ethical…

Legal issues

❑ If an enterprise finds itself bankrupt as a result of using the advice of an RS-based application? Who is liable?

✓ The enterprise itself be held responsible for not testing the system adequately before entrusting it with sensitive or volatile issues?

✓ Auditing and accounting firms share the liability for failing to apply adequate auditing tests?

✓ Software developers of recommender systems be jointly liable?

Privacy

❑ The right to be left alone and the right to be free from unreasonable personal intrusions

❑ Related to legal, ethical, and social issues in many countries

❑ Two rules that applies to interpretation of privacy

1. The right of privacy is not absolute (needs to be balanced against the needs of the society)
2. The public's right to know is superior to the individual's right to privacy

Privacy issues

❑Collecting information about individuals - recommender technologies aim to provide targeted services and marketing to consumers

❑**Virtual personal assistants - Amazon's Echo/Alexa and similar devices listen to what is going on at all times**

❑Mobile user privacy - Tracking through the smartphones - not just the **cell-phone providers but potentially many apps on your phone**

❑Privacy in IoT networks - More data are flowing with IoT networks. AI data privacy issues are on the rise, especially when RS deals with consumers' data

Privacy issues

❑ Recent technology issues in privacy and analytics - many companies have started to employ User Modelling technologies to develop profiles of users on the basis of their device usage, surfing, and contacts

❑ Delaware police are using AI dashcams to look for fugitives in passing cars. Photos and videos taken are sent to the clouds and analyzed there by AI algorithms

❑ Facebook's face recognition systems create concerns regarding privacy protection

❑ Epicenter offers its employees a microchip implant. It acts like a swipe card, opens doors, buys you food in the company store, and much more. But management can track you too. It is given only to volunteers.

Privacy

❑Who owns private data?

✓User or technology provider?

✓New cars incorporate many sensors, e.g. tire pressure sensors, GPS trackers that can keep track of where you have gone, how fast you were driving, when you changed lanes, and so on. The car may even know the passenger's weight added to the front seat. All these information can be a privacy nightmare for the owner or a data "gold mine" for whoever can possess or analyze these data

✓Battle between car manufacturers and tech providers (Apple, Google) as to who can access this data

✓Apps collect data about the users: Google's Waze, Yelp, Spotify

Privacy issues are considered in many cases as important components of ethics

Ethical

❑The study of ethical issues is complex because of their multidimensional nature, something may not be illegal, but may not be ethical either

❑Transparency on what RS does for both vendors and customers is needed in order to stay ethical

❑This way people can stay honest and adhere to the goals of RS, so it can play a significant role in our life and work

The Importance of Ethics in Recommender Systems

❑ Social and Economic Impact:
- ✓ Recommender systems have a significant influence on purchasing decisions, media consumption, and even political opinions
- ✓ They "shape" what the user see and buy, which can profoundly impact society

❑ Benefits:
- ✓ Improve user experience, help discover new content, increase the efficiency of online services

❑ Risks:
- ✓ Can perpetuate **biases**, invade **user privacy**, create **filter bubbles**, and promote **misinformation**

Ethical Principles in Recommender Systems - Transparency

❑Explainability:
- ✓Users must understand how recommendations are made
- ✓Transparency builds trust and allows users to make informed choices

❑Consent:
- ✓Users should be informed about how their data is used and should have the option to consent or not to such use
- ✓Example: Platforms providing clear terms of service and privacy options, allowing users to choose what data they share

Ethical Principles in Recommender Systems - Privacy

❑ Data Protection:

  ✓ Protecting users' personal information is crucial

  ✓ This includes ensuring data is stored securely and used responsibly

  ✓ Example: Implementing strict privacy and data security policies to safeguard user information

❑ Data Minimization:

  ✓ Collect only the necessary data needed to operate the recommender system, avoiding excessive collection of sensitive information

Ethical Principles in Recommender Systems - Fairness and Equity

❑Non-Discrimination:
- ✓Algorithms should be designed to **avoid biases and discrimination**, ensuring recommendations are fair to all users
- ✓Examples?

❑Diversity:
- ✓Promote diversity of content in recommendations, avoiding the creation of **filter bubbles** where users only see similar content to what they already consume
- ✓Example: Spotify diversifying music recommendations to include new artists and genres

Ethical Principles in Recommender Systems - Responsibility

❑ Responsibility for Content:

✓ Platforms should take responsibility for the content they recommend, ensuring they do not promote false or harmful information

✓ Example: YouTube adjusting its algorithms to combat misinformation and remove harmful content.

❑ Mitigating Negative Impacts:

✓ Assess and mitigate the potential negative impacts of recommendations, such as content addiction or opinion manipulation

✓ Implementing usage time limits and promoting digital well-being among users

Ethical Principles in Recommender Systems - User Benefit

❑Utility:
  ✓Recommendations should be useful and relevant
  ✓Helping users find content of interest efficiently
  ✓Amazon improving product suggestions based on purchase history and user reviews

❑Well-being:
  ✓Promote the well-being of users by avoiding recommendations of harmful content, such as violent or addictive material

Examples

❑Netflix:
- ✓Provides reasons for recommendations and offers settings for users to manage their viewing history and preferences.
- ✓Uses collaborative filtering to analyze viewing patterns of millions of users
- ✓Algorithms based not only on viewing history but also strives to diversify suggestions, including new content and explaining why certain movies or series were recommended.
- ✓They also consider metadata like genres, actors, and user ratings to offer diverse recommendations
- ✓Provides users with tools to manage their data, such as viewing and deleting watch history

Examples

❑Spotify:

✓Use of collaborative filtering and natural language processing helps identify emerging artists and genres

✓Allows users to see why a particular song was recommended, increasing transparency

✓Spotify personalizes playlists and recommendations based on listening preferences but also works to introduce users to new artists and genres

Examples

❑Amazon

✓Uses item-to-item collaborative filtering, which compares the items a user has purchased or viewed with similar items bought or viewed by others

✓Maintain strict privacy policies and use encryption to protect user data, ensuring recommendations are both useful and secure

✓Data protection measures include encryption of data in transit and at rest, as well as regular security audits

✓Allows users to manage their browsing history and personalized recommendations, providing transparency and control over their data

Examples

❑YouTube:

✓Recommends videos based on user watch history, search history, and engagement metrics. They have implemented measures to limit the spread of harmful content

✓Recommendation algorithm uses machine learning to suggest videos that are likely to engage the user

✓To combat misinformation, YouTube prioritizes authoritative content from verified sources, especially for news-related videos

✓Provides users with options to manage their watch history and receive fewer recommendations from channels they aren't interested in

Examples

❑LinkedIn:

✓Uses collaborative filtering and machine learning to match users with relevant job listings based on their profile, experience, and activity

✓Tools for users to understand why a job was recommended, enhancing transparency

✓To protect user data, employs strong encryption and adheres to GDPR regulations (Consent, Right of Access, Right to be Forgotten, Data Portability, Breach Notification and Privacy by Design)

Examples

❑TikTok:

✓Recommendation algorithm analyzes each user's viewing behavior, including watched videos, interactions (likes, comments, shares), and scrolling patterns

✓To promote user safety, TikTok has strict policies against bullying, harassment, and inappropriate content

✓Parental controls and comment moderation tools to protect younger users

✓Also introduced screen time limits and excessive usage notifications to encourage healthy app usage habits

✓But the most important metric this algorithm considers when recommending content is engagement with the video, namely, how long a user watches it

✓"fadiga de decisão" https://www.linkedin.com/pulse/ascens%C3%A3o-do-tiktok-os-dois-lados-da-moeda-de-um-andr%C3%A9-gualtieri/

Examples

❑Facebook

  ✓Facebook's News Feed recommendation system uses machine learning to display posts most relevant to each user, based on past interactions

  ✓To increase transparency, Facebook introduced the "Why am I seeing this?" feature, which provides context on why specific posts and ads appear in a user's feed

  ✓Strict privacy controls allowing users to manage their data and opt out of targeted advertising

  ✓They also work to combat bias by regularly auditing their algorithms and adjusting them to prevent discrimination in ad delivery and content recommendations

Examples

❑Twitter:
- ✓Recommendation algorithm analyzes a user's tweet history, retweets, likes, and interactions to suggest relevant content
- ✓To increase transparency, introduced the "See less often" option for users to indicate what type of content they do not wish to see in their feeds
- ✓Offers detailed privacy settings, allowing users to control who can see their tweets and interactions
- ✓They have also implemented policies to combat spam, hate speech, and misinformation, aiming to promote a safe and healthy environment for users

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