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Implicit ratings

SI583: Recommender Systems

Recap: Eliciting Contribution of Ratings/Feedback

Learning objective:

- Learn how motivating factors are evaluated, what factors have been found to influence people's contribution, and the design implications of these results.

- Two sets of studies:
  - Slashdot commenting
  - MovieLens research on movie rating contribution

This class: Use of Implicit Ratings/Information

- Learning goal:
  - ways in which implicit information has been used
  - a framework to think about different categories of information [Oard&Kim]
  - high-level operation of recommenders using implicit information

Why use implicit information?

- Implicit information: information about users' preferences and/or item qualities that are inferred by monitoring user's activities
- .. *not* derived by asking user how much she liked an item

- advantages and disadvantages?

Useful information in Netnews[Morita and Shinoda]

- Idea: read times of news articles may reflect preference/quality

- Methodology:
  - volunteers use modified software to record read times
  - Later asked to rate articles
  - Check how closely they are correlated

Useful Information in NetNews

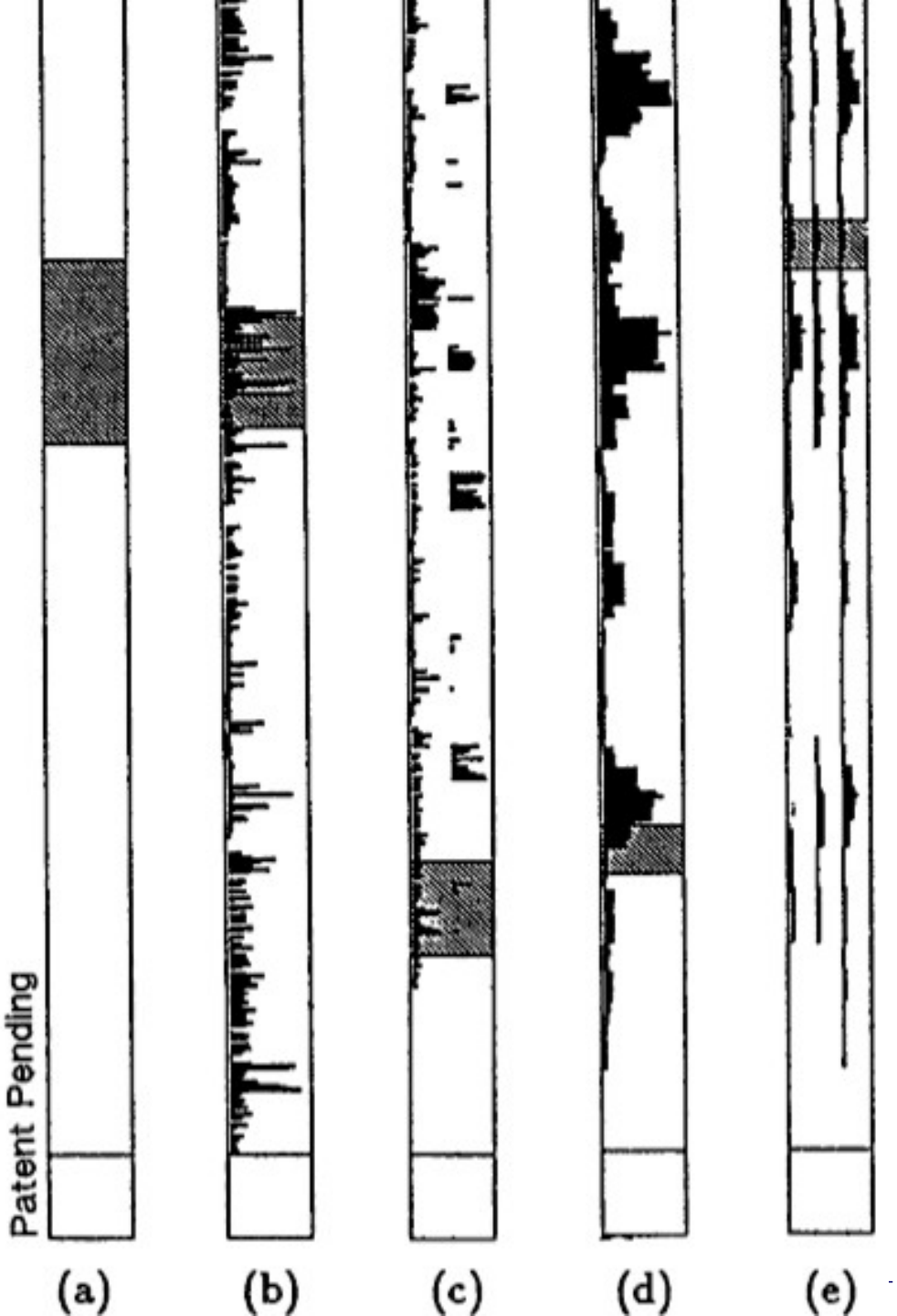
- Result: Read times are very highly correlated with stated preference

- Later confirmation by [Konstan et al, CACM '97]
  - Recommenders built to use read time information are almost as accurate as recommenders using reported preferences.

Edit Wear and Read Wear [Hill et al]

- Augmenting an editor to
  - track read times for each segment of text
  - show where the most frequently edited/read pieces of information are.

Wear Indicators: Scroll Bar



PD-INEL Source: Undetermined

Edit and Read Wear: Insights

- Innovative interface for guiding users towards interesting content segments
- Physical media have built in “behavior-based recommenders”
  - goal: reconstruct this in the digital environment
- A slightly different design goal: summarization rather than recommendation

Applications and information examples

A systematic framework[Oard and Kim]

- Types of observable information categorized along two dimensions
  - Purpose
  - Scope/granularity
- More structured than the “implicit/explicit” categorization

Framework [Oard and Kim]

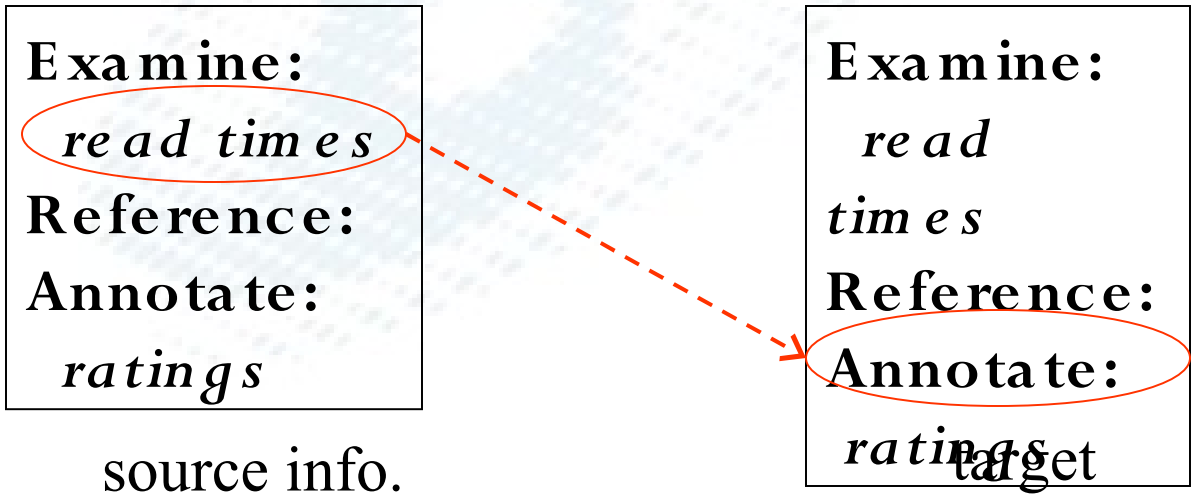
Behavior Category	Minimum Scope: Segment	Minimum Scope: Object	Minimum Scope: Class
Examine	View Listen	Select	
Retain	Print	Bookmark Save Delete Purchase	Subscribe
Reference	Copy-and-paste Quote	Forward Reply Link Cite	
Annotate	Mark up	Rate Publish	Organize

Table 2. Potentially observable behaviors.

PD-INEL Source: Oard and Kim

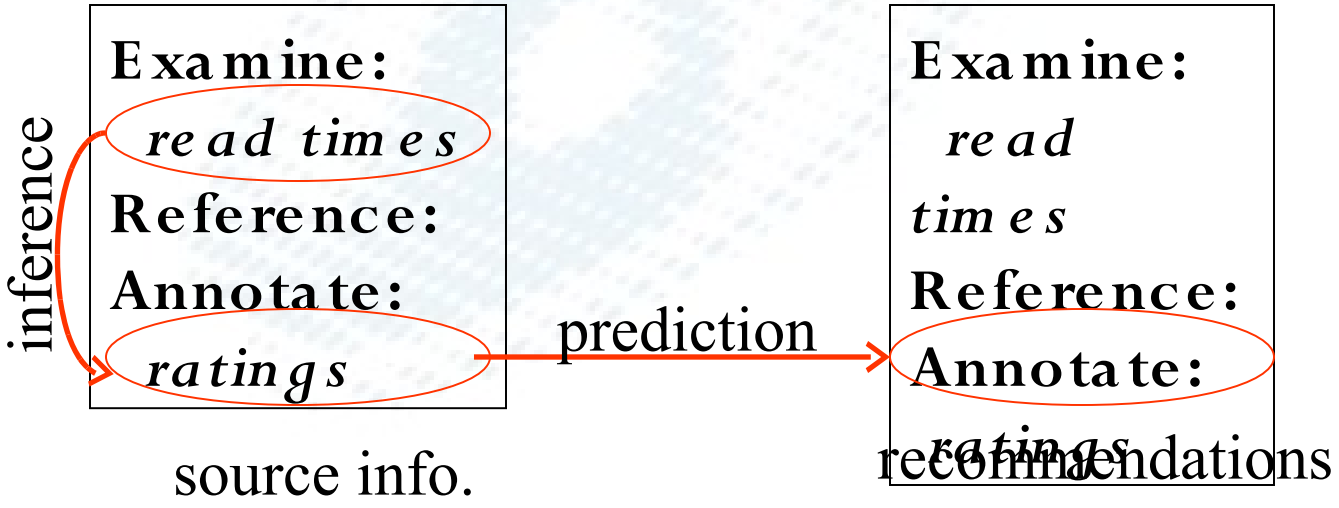
Prediction and Inference

- Recommendations are based on predictions of particular behaviors, which can also be categorized in this way
- May be in a different category from the information used to make recommendations



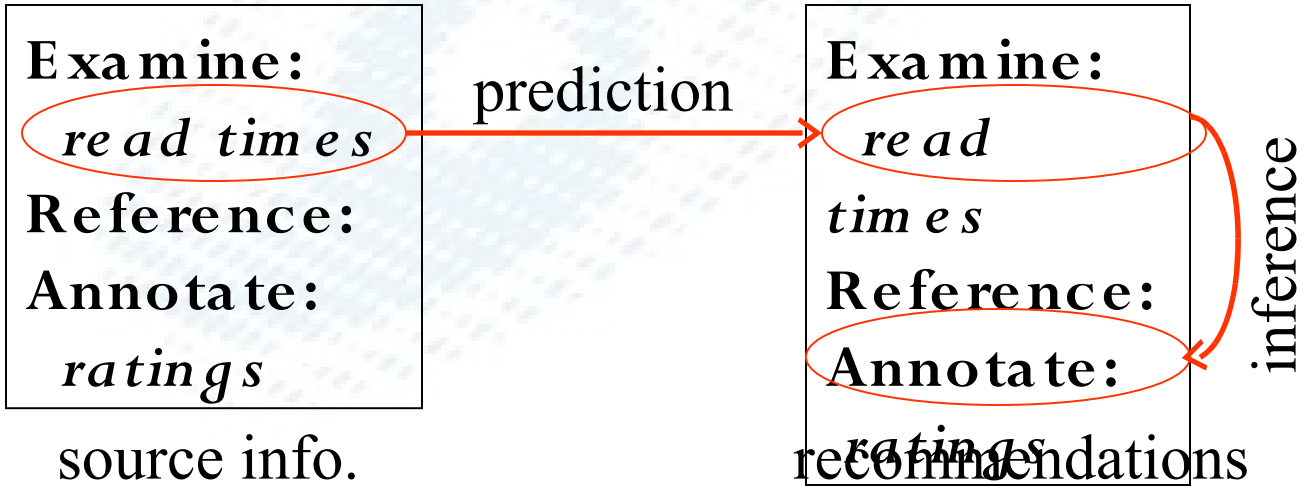
Prediction and inference

- Can use
  - statistical inference between categories
    - "long read times tend to be correlated with high ratings"
  - collaborative filtering prediction algorithms



Prediction and inference

- Alternative: flip the order
  - collaborative filtering prediction algorithms
  - statistical inference between categories
    - "long read times tend to be correlated with high ratings"



Advantages of each method

- Prediction-inference allows for common prediction, followed by personalized inference
  - e.g., Slashdot score is a "prediction" of average reader's rating
  - A user who liked comments the average reader found bad could adjust the inference made
- Inference-prediction may require less communication
  - assuming many observations go into one inference

Implicit information

- easier to obtain lots of data
- can't choose format, so requires good inference procedures
- can be built around collaborative filtering algorithms for explicit ratings