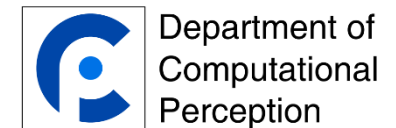


# INTRODUCING SURPRISE AND OPPOSITION BY DESIGN IN RECOMMENDER SYSTEMS



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# BACKGROUND

- long tradition of accuracy-based focus in research on recommender systems
- novel qualities beyond pure accuracy:
  - e.g., diversity, novelty, serendipity, discovery, unexpectedness,...
  - focus of this work: **surprise and opposition**
- particularly fields of applications:
  - several recommendations in the row and
  - items to be recommended are intended to entertain the user
    - e.g., videos, jokes, music

# STARTING POINT FOR RECOMMENDER SYSTEMS RESEARCH IS TYPICALLY

old approach: system has to identify and suggest items that match the user's preferences and/or interests

- challenge: always the same... not desired... boring...

new approach: system has to identify and suggest items that both

- match the user's preferences and/or interests &&
- still are outside the user's typical comfort zone
- challenge: difficult to find the right balance between inside and outside comfort zone, such that the user perceives the recommendations as a surprise or opposition and does not perceive the suggested item a result of a poor quality recommender system

→ novel approach

# NOVEL APPROACH

- a user's perception can be triggered (“designed”), by leveraging the connections or transitions between consecutively recommended items
- → purposely create perception of qualities such as surprise or opposition
  - “Surprise by Design”
  - “Opposition by Design”
- applicability:
  - series of recommendations (i.e., continuous or serial recommendations)

# HOW COULD THIS WORK?

- some examples:
  - smooth jazz ballads – up-tempo Bebop
    - increasingly higher tempo
    - four smooth jazz ballads, then up-tempo Bebop surprise
  - movie star
    - action movies
    - satiric or comedy movies

# CONCEPTUAL FOUNDATIONS

Priming

Nudging

# Priming

- implicit, non-conscious memory effect in which the exposure to a stimulus influences the response to another stimulus
- major part of research on priming is based on textual tasks
  - e.g., word-stem completion task

## Nudging

- positive reinforcement and indirect suggestions  
→ to achieve non-forced compliance
- a nudge = aspect that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives



# EXAMPLES FOR PRIMING FOR SURPRISE AND OPPOSITION

- depending on what has been played first, an upcoming song may be perceived
  - surprising because it was not expected to be the next song (or be in the playlist at all) or
  - the song is quite the opposite from what was expected, so arousing opposition
  
- very trivial examples:
  - an up-tempo song following a sequence of slow songs
  - a sequence of songs from one genre and, suddenly, some different genre
  - a sequence of songs of the same artist, then another artist
  - ...

# CHALLENGES FOR PRIMING FOR SURPRISE AND OPPOSITION

- creating “good” surprise or opposition is not as trivial as those examples may indicate
- surprise is not always a positively connoted surprise
  - expecting another smooth jazz song instead of a death metal
    - enjoyment of combination?
    - stimulus sufficiently strong for user?
  - learning effect for user
  - depending on situation:
    - attentive listening vs. listening during primary task (e.g., work)
    - at work positive surprise; whereas while perceived disturbing while jogging
  - labeling:
    - in “reggae playlist”: a song by Frank Sinatra be surprising, but could be annoying because it does not meet the expectations/acceptance level

# PRIMING FOR SURPRISE HAS TO ACCOUNT FOR

individual

situational

temporal

cultural

in general, contextual differences

# EXAMPLES FOR NUDGING FOR SURPRISE AND OPPOSITION

- altering a user's music consumption behavior for provided suggestions
- making an option a default increases the probability that it is chosen → default effect

# CHALLENGES FOR NUDGING FOR SURPRISE AND OPPOSITION

- default option may be perceived as the “mainstream” option
  - happily follow the crowd/mainstream (conformity? popularity?)
  - avoid it (following the crowd/mainstream may be perceived “uncool”)
  
- contrast between popular song (e.g., rock anthem “We will rock you”) and unknown song, only if concepts and relations perceived as such

# NUDGING FOR SURPRISE AND OPPOSITION HAS TO ACCOUNT FOR

individual

situational

temporal

cultural

in general, contextual differences

# FUTURE WORK

although priming as well as nudging are rooted in well-established theories  
→ transfer to recommender systems open up a new research area

requires holistic approach

- integration of knowledge from various **disciplines**
  - e.g., computer science, psychology, economics, law
- and **perspectives**
  - e.g., user, platform provider, music creators, artists, labels
- and **methods**
  - e.g., experimental user studies, field studies, prediction experiments, etc.

how to prime perceptions “generally” in recommendations

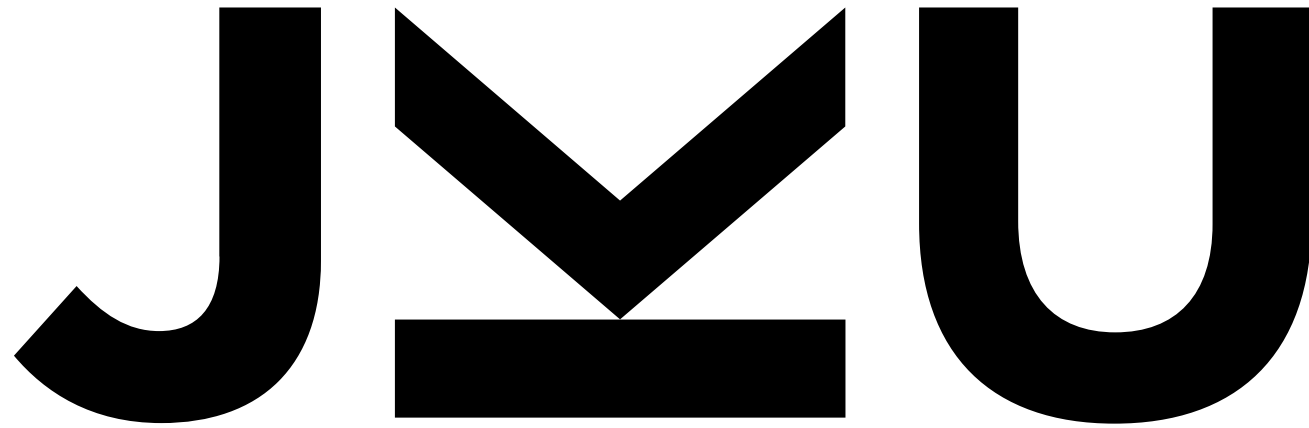
how to prime in specific cases/contexts

# TAKE AWAY...

- through **priming** and **nudging** →
  - “Surprise by Design”
  - “Opposition by Design”
- applicability:
  - several items suggested in a row (i.e., continuous or serial recommendations)
  - items recommended are intended to entertain the user (e.g., videos, jokes, music)
- complex and requires holistic approach







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