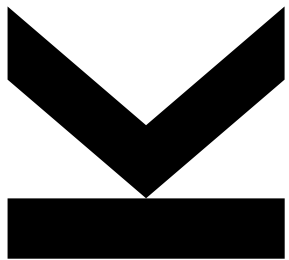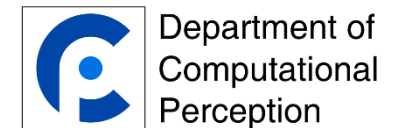# INTRODUCING SURPRISE AND OPPOSITION BY DESIGN IN RECOMMENDER SYSTEMS

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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**
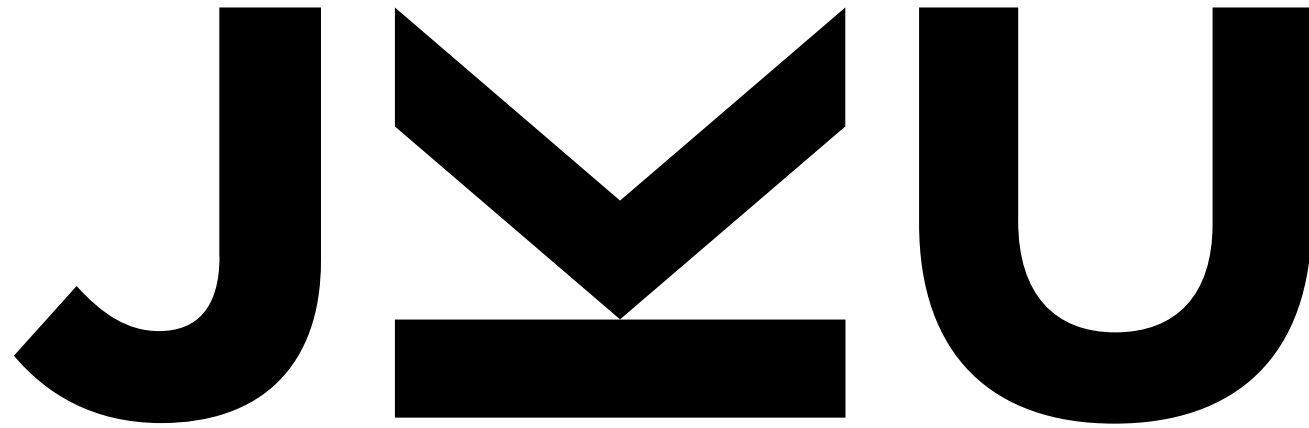 - e.g., experimental user studies, field studies, prediction experiments, etc.

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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