

Blending Users, Content, and Emotions for Movie Recommendations

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Movie Recommendations

- Very populated research topic
- Due to data availability
 - EachMovie
 - MovieLens
 - NetFlix
- Developed many solid methods
 - Personalised recommendations
 - Statistical methods
 - Feature-based methods
 - Conversational methods
 - Mainly focus on predictive accuracy

The screenshot shows a user interface for movie recommendations. At the top, there are tabs for 'Predictions for you' (selected), 'Your Ratings', 'Movie Information', and 'Wish List'. Below these are five movie entries with star ratings and dropdown menus for 'Not seen' or 'seen'. The movies listed are:

- About a Boy (2002) DVD, VHS, info | imdb Comedy, Drama
- Chicago (2002) info | imdb Comedy, Crime, Drama, Musical
- And Your Mother Too (Y Tu Mamá También) (2001) DVD, VHS, info | imdb Comedy, Drama, Romance
- Monsoon Wedding (2001) DVD, VHS, info | imdb

Below this is a section titled 'matcha' with tabs for 'All', 'Movies', and 'TV'. It displays a grid of movie and TV show covers. The categories shown are:

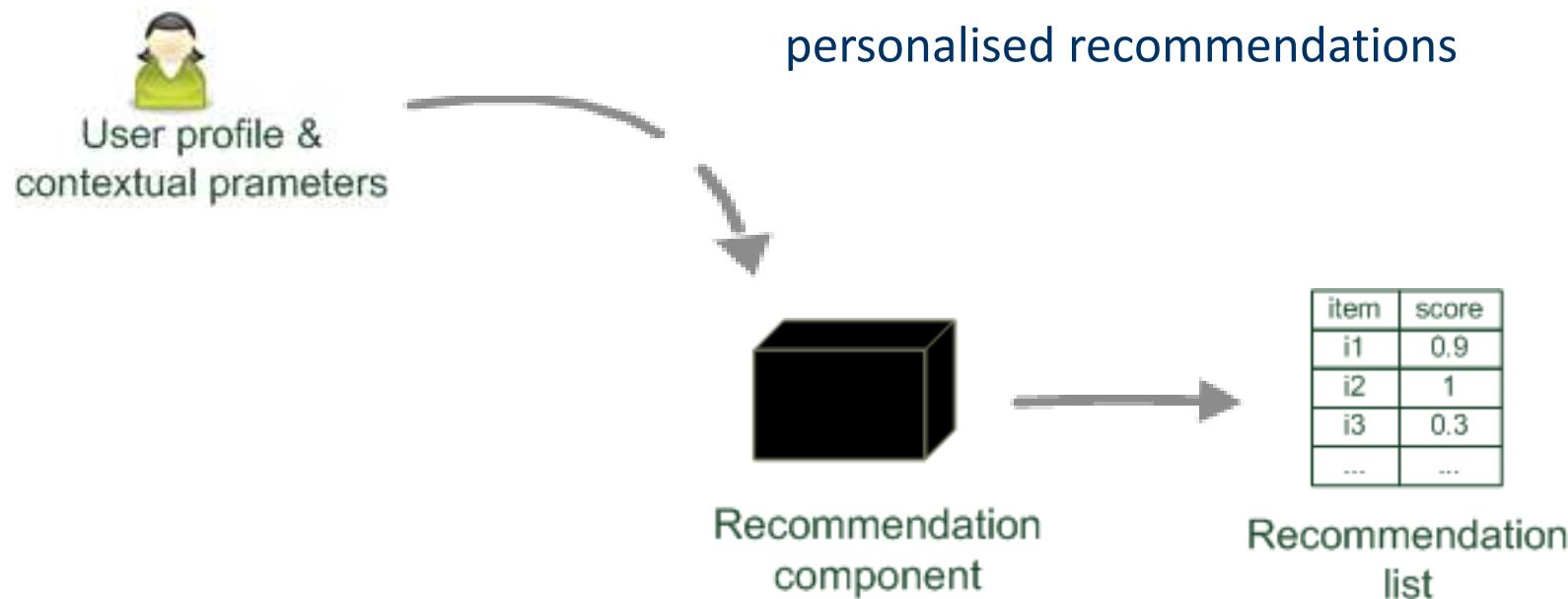
- NEWLY AVAIL: OUT OF SIGHT, FULL HOUSE, IKE, THE 19 WIFE
- RECOMMENDED FOR YOU: LIMITLESS, modernfamily, HOW I MET YOUR MOTHER, Parks & Recreation, THE FIGHTER, THE WALKING DEAD
- FRIENDS: Caddyshack, woodstock, Monday Night Fever, glee, THE PHANTOM, Bringing Up Baby

At the bottom, there are links for Netflix, Hulu Plus, iTunes, Amazon, Amazon Prime, and Xfinity. A note says 'Stars: John Travolta, Uma Thurman and Samuel L. Jackson'.

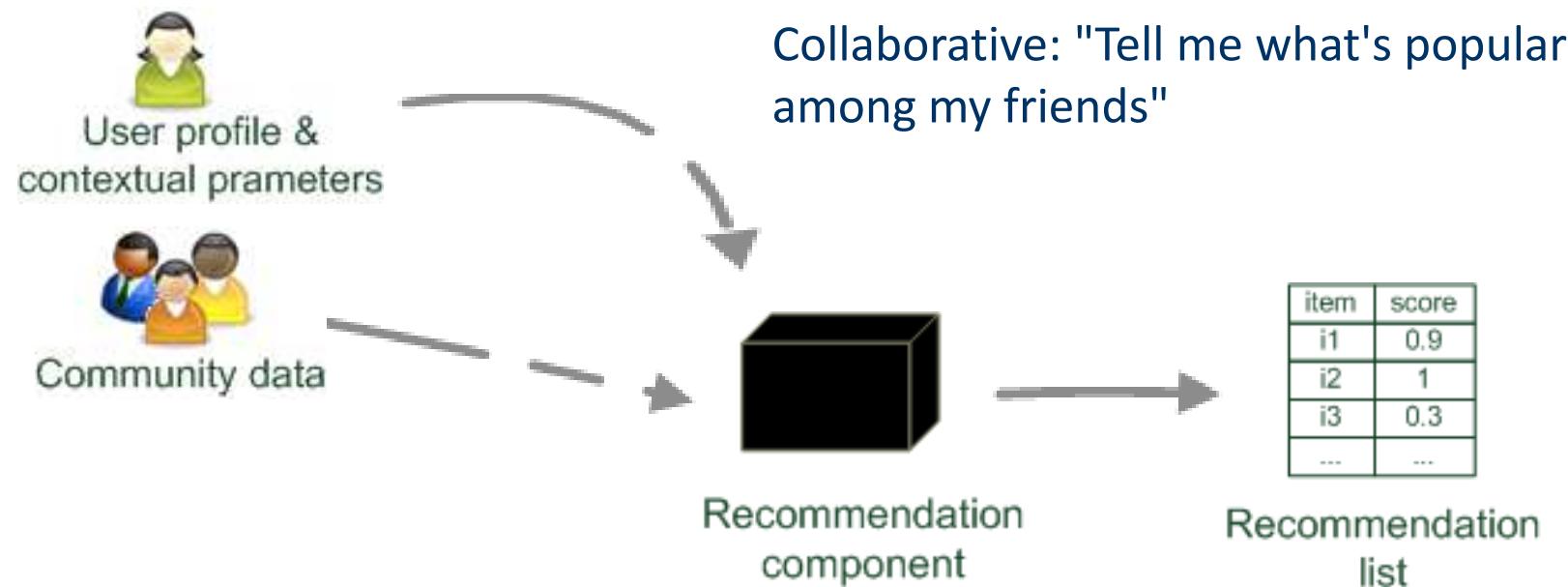
More information about the movie....



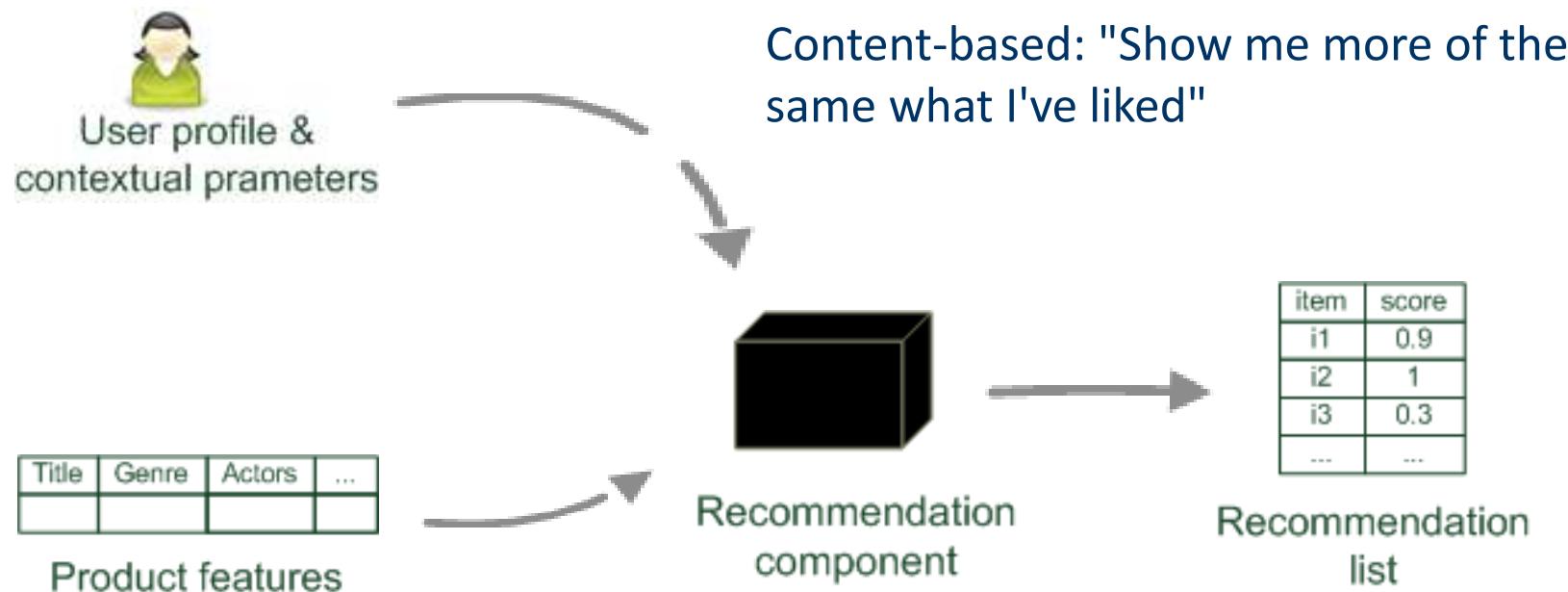
Paradigms of Recommender Systems



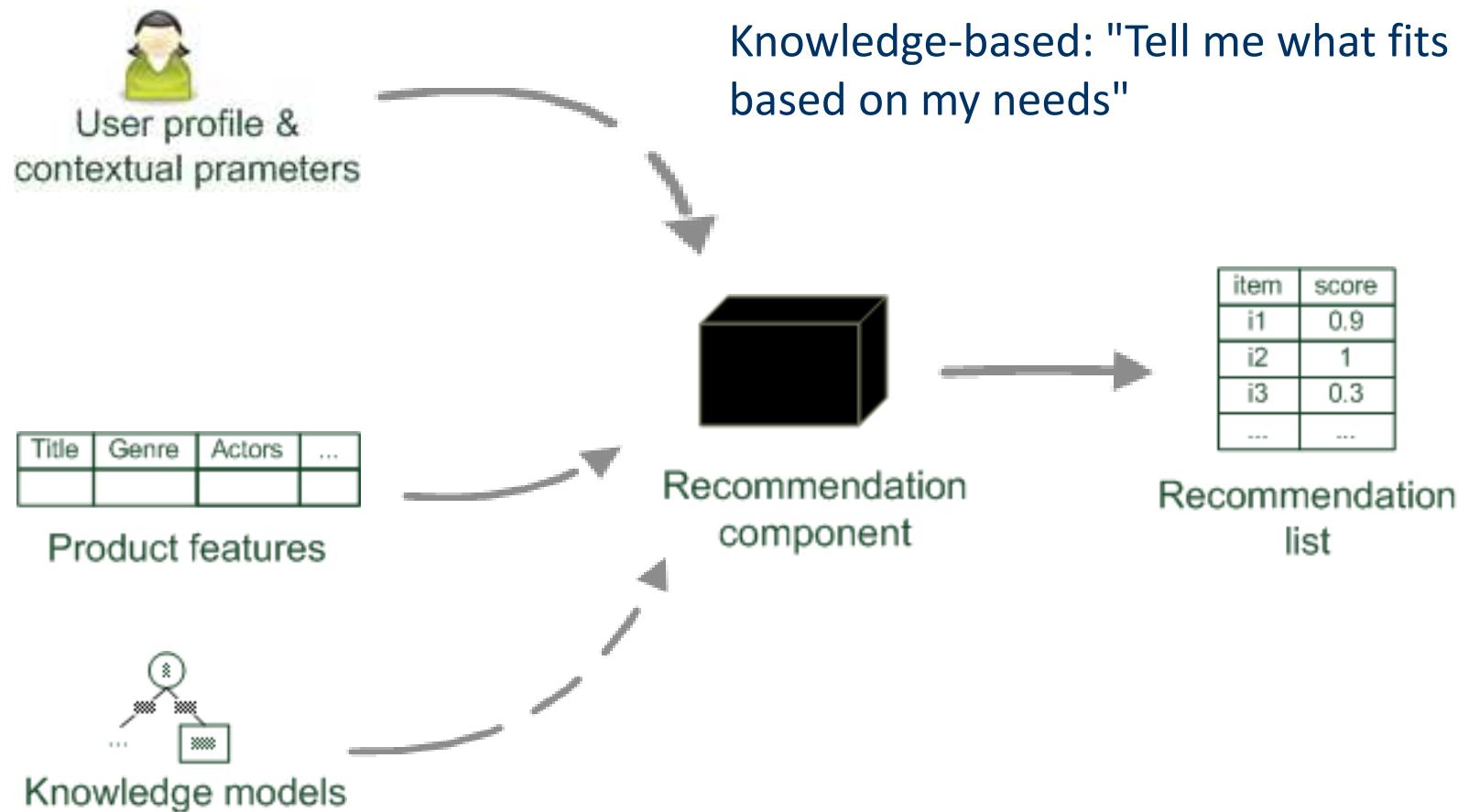
Paradigms of Recommender Systems



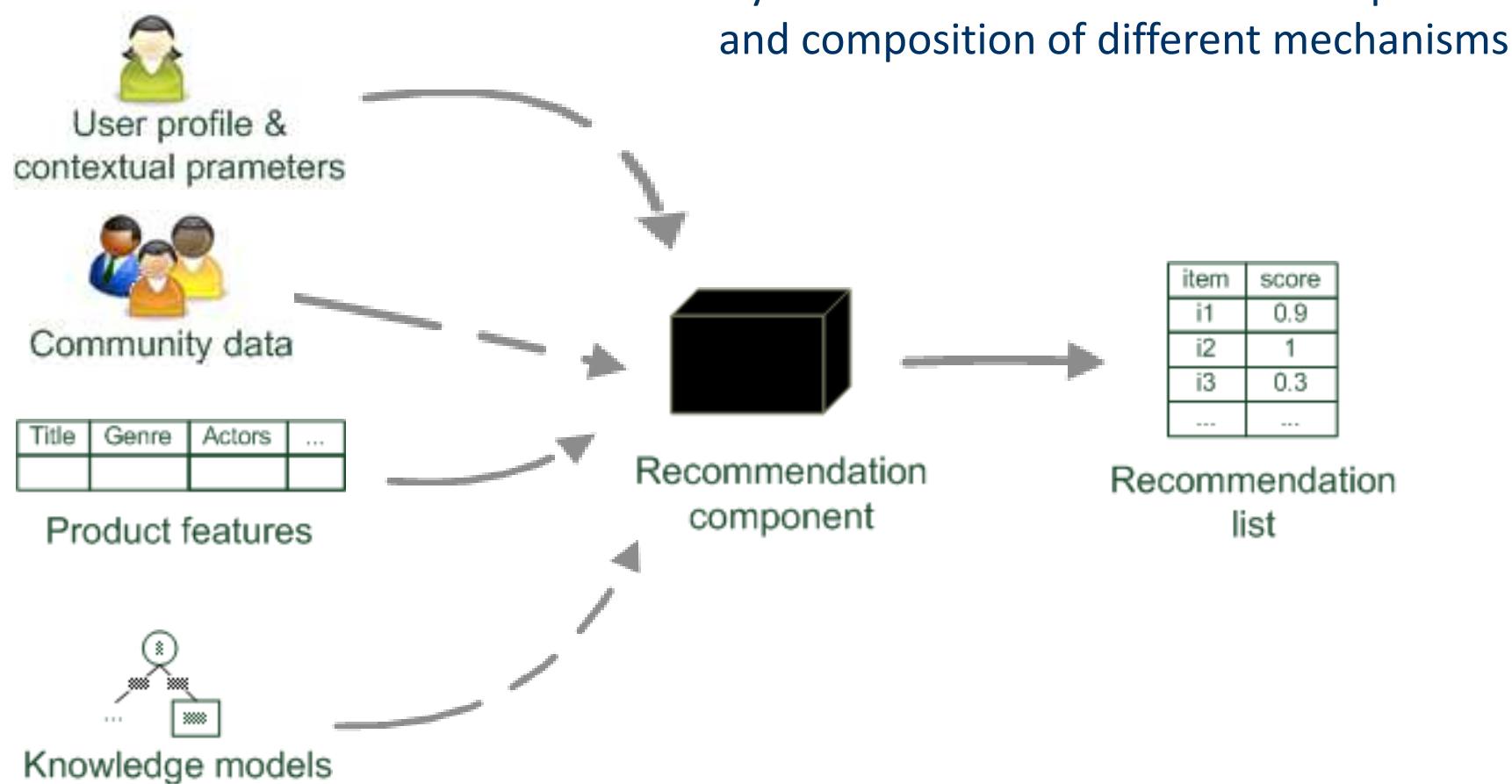
Paradigms of Recommender Systems



Paradigms of Recommender Systems



Paradigms of Recommender Systems



~~MOVIE~~ Movie Recommendations

- Same methods applied to many domains
- One-size-fits all?



- Is there anything special about movies?

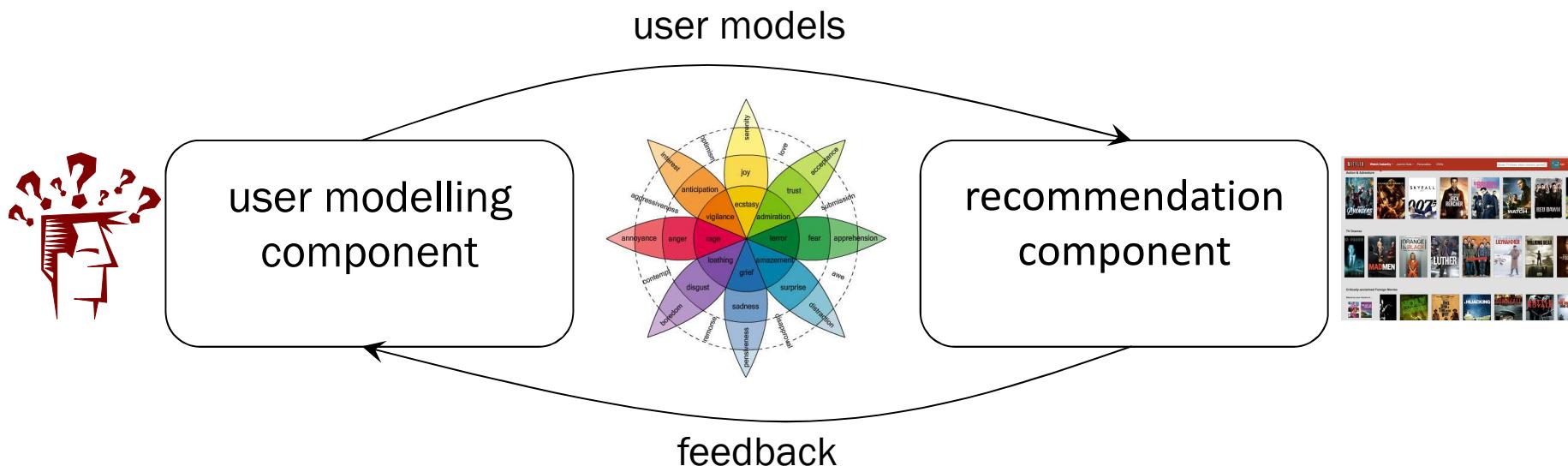
Why do People Watch Movies?

- Escape from reality
 - “Take us to places we've never been and inside the skin of people quite different from ourselves”
- Experience emotions
 - “A film is - or should be - more like music than like fiction. It should be a progression of moods and feelings. The theme, what's behind the emotion, the meaning, all that comes later.” -- Stanley Kubrick
 - “If my films make one more person miserable, I'll feel I have done my job.” -- Woody Allen
 - “Through careful manipulation and good storytelling, you can get everybody to clap at the same time, to laugh at the same time, and to be afraid at the same time.” -- Steven Spielberg



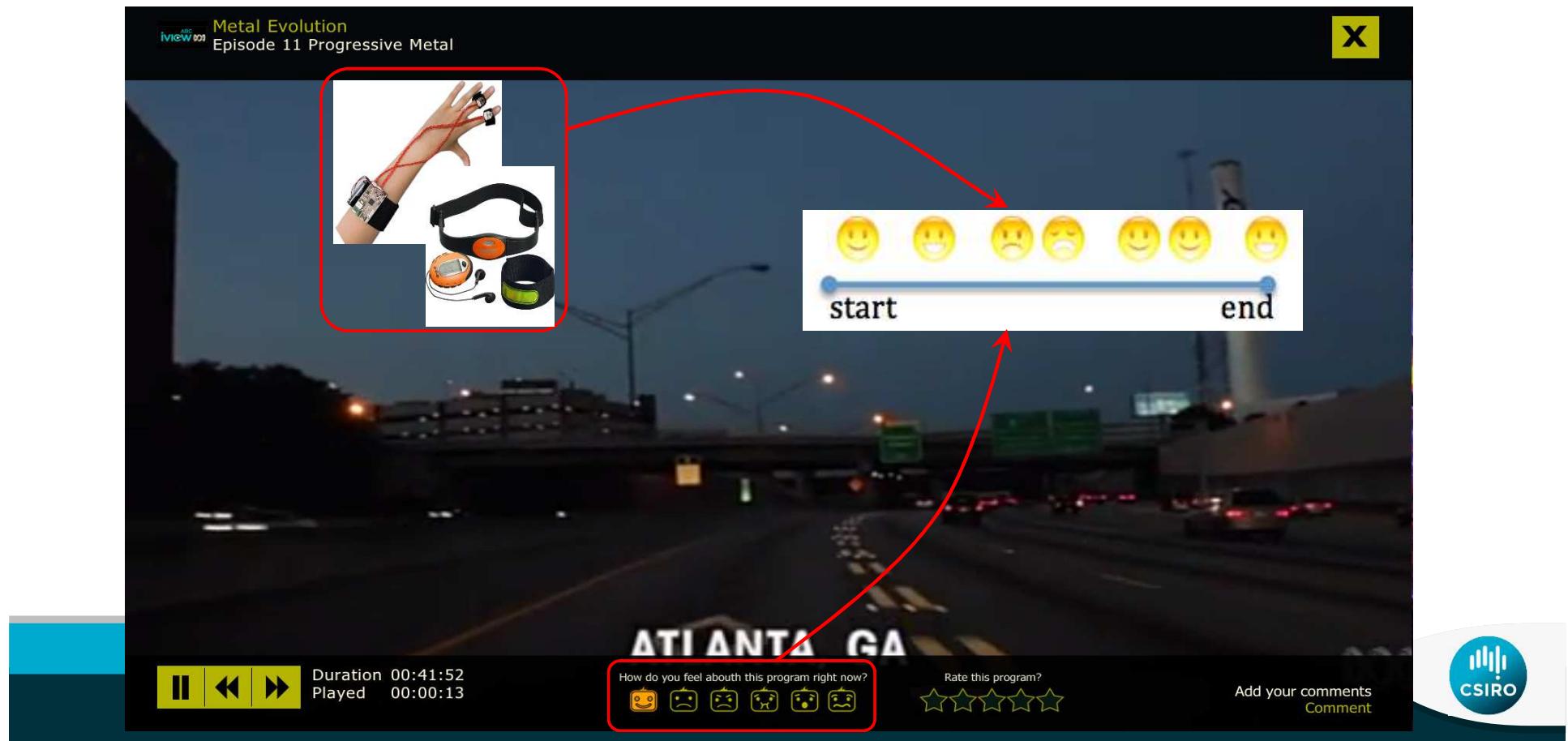
Emotions in Movie Recommendations

- What is the role of emotions in movie recommendations?
 - Emotions in user modelling
 - Emotions in recommendations
- Can emotions be in the core of movie recommendations?



Emotion Centric User Modelling

- Experienced emotions reflect liked/disliked content
 - Explicit (self-reported) and implicit (observed and sensed)
- Potentially very fine granularity of user models



Emotion Centric User Modelling

- Explicit modelling
 - Second screen application
 - Barely feasible for movies
 - Users are immersed
 - Self-reporting breaks the flow
- Observable emotions
 - Face
 - Posture
 - ~~Tell~~
 - Voice
 - Touch



Observable Emotions

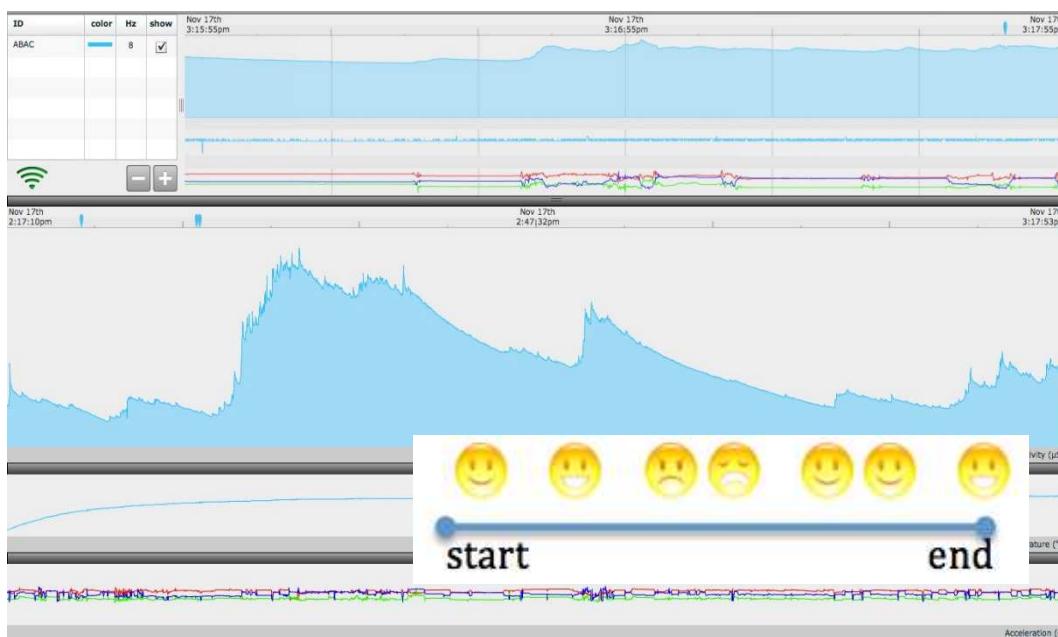


Observable Emotions



Sensed Emotions

- Electrocardiogram (ECG), electroencephalogram (EEG), galvanic skin response (GSR), and more
- Affectiva → Empatica
- Q-Sensor → Embrace / E4



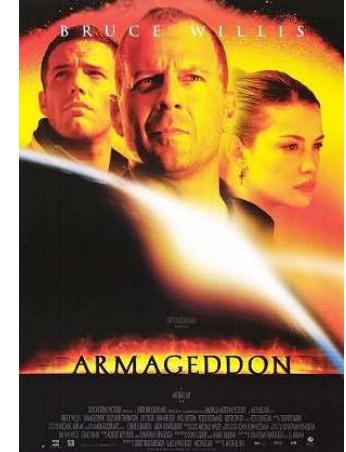
User Modelling: Open Questions

- What is the “minimum viable product” for measuring emotions?
 - Mobile sensing app? Ambient technology? Smart environment?
- How to recognise / measure / discretise the captured emotions?
 - Representation? Intensity measurement? Transitions between emotions?
- How to interpret user responses to a series of emotional triggers?
 - Sequential effect of triggers? Variety of “contextual” dependencies?
- Can emotion-based modelling tool be standardised and validated?
 - “TV tuning test card”? Sample size vs coverage? Sensitivity and calibration?
- What can emotion-centric model tell about traits and personality?
 - Personality model? Behavioural traits? Consumption patterns? Lifestyle?



Content Annotation: Scenes

- 0:35 Opening sequence; comet hits Earth
- 3:30 Comet fragments hit space shuttle; engineers scramble to understand
- 6:20 Shuttle explodes; asteroids begin to hit New York City
- 10:30 President learns of problem in space; asteroid is the size of Texas;
- 12:00 Focus of film changes to Stamper Oil
- 17:00 Feasibility planning meeting at NASA; Oil is struck by Stamper Oil
- 22:30 Harry Stamper is taken to NASA to talk with engineers
- 27:00 Stamper begins to round-up his crew of roughnecks to assist NASA
- 32:00 Stamper's crew accepts the challenge to go to space
- 35:00 Crew preparedness and training program is performed
- 42:00 Shots of asteroid are shown; flight plan is explained
- 48:00 Armadillo drilling rig is tested
- 51:00 Astronauts are permitted a night out before the launch
- 58:00 Media learns of problems; report from Cape Canaveral
- 1:01:00 Astronauts prepare for trip
- 1:03:00 President announces Armageddon



Content Annotation: Shots



Time	Length	Description of Shot
1:40:24	5 seconds	Head on shot; medium long. Camera remains stationary. Shot begins with ambient noise and soft “battle-esque” music and gradually it gets louder. There is what sounds like metal clanging in the distance and a loud scream –almost animalistic. At the end, the shot cuts to next one.
1:40:29	2 seconds	Camera remains stationary fixed on Perry. This short scene contains his head down to about his shoulder and only includes his left shoulder and right side of head. The rest of his body is cut by the camera angle. The camera is stationed in front of Perry facing upward at about a 45 degree angle. But only his right side is visible due to him looking off to his left. Perry is in the foreground and the only thing in the background is a street pole with a “don’t walk” sign lit in red and a red and white traffic sign. In the beginning of the shot we hear the end of the scream carried over from the last shot. Then the only noise is muffled drumming. The shot cuts pretty cleanly to the next.
1:40:31	2 seconds	This short close up shot is head on and facing a man’s torso and the barrel of a gun. The camera shifts to the right slowly as the subject is moving the gun from the bottom of the screen to the top, with the barrel facing directly at the camera. The sliver of background viewable is grey. There is a white mist over the whole shot which gives a porous/ dreamlike effect. There does appear to be a white light (possibly a dim spotlight) far above the camera. This is visible through a reflection off the barrel of the gun and in the movement of the arm. The sound in this shot switches from being a clangy metal sound and silence. The end of this shot cuts to the next.
1:40:33	3 seconds	This is a close-up shot of Perry’s wife. It contains only her face, hair and neck. It is shot from Perry’s point of view. The camera remains stationary and is positioned at a head on angle. The only sound is that of reverberation carried over from the metal clanging in the last scene. The transition consists of another clean cut.
1:40:36	2 seconds	This shot is a medium shot and the camera remains stationary. The camera facing Perry but at a slight angle in order to see around the back of his wife’s head which is in the foreground but not completely in focus. The loud/muffled gunshot is carried over from the last scene to tie the two scenes together. I would say the shot transitions to the next by utilizing a wipe. In this scene we see a head falling toward the bottom of the camera frame and in the next we see a body falling from the top of the screen, so it continues the falling theme.

Emotion-Aware Recommendations

- Collaborative / MF
 - Establish emotion-based user-to-user similarity
 - Establish trigger-based item-to-item similarity
 - Factorise emotional preferences
- Content-based
 - Model emotional triggers in movies and intersect with emotional model
- Conversational / knowledge-based
 - Link movies through their emotional triggers
 - Incorporate emotional features in critiques
- These are *emotion-aware* rather than *emotion-centric*



Emotion-Centric Recommendations

- Typical scenario
 - “I want to watch a funny movie tonight..”
- But they want more than they say



- Need help from behavioural scientists and marketologists
 - P.Aurier, G.Guintcheva, “The Dynamics of Emotions in Movie Consumption: A Spectator-Centric Approach”, International Journal of Arts Management, 2015

What Do They Really Want?

- They do want to experience emotions
 - “The main thing is to feel something. When you walk out having experienced something, whether it's fear, sadness, joy or whatever that tells you if the movie was good or bad. If you don't feel anything, the movie is a flop.”
- They want fine-grained emotions
 - Prototypical: joy, sadness, calmness, fear, anger, disgust
 - Second order: combination of prototypical emotions
 - Romanticism, melancholy, nostalgia, compassion, tenderness, frustration
 - Second-order emotions are more impactful and memorable
 - “These are simple emotions: either joy or sadness. But I can seek new emotions and see what it's like to experience something other than everyday emotions like happiness while watching a romantic comedy.”



What Do They Really Want?

- They want a rollercoaster of emotions
 - Different polarity
 - “At the beginning, you get the impression of joy and calm... But you quickly sense that something's not quite right. You don't experience [the emotions], they're superficial. It's just too good to be true and it's tied with the feeling that something bad is going to happen.”
 - “When the laughs die off towards the end, you feel a bit of melancholy and empathy for characters, after their monologue.”
 - Different intensity and duration
 - “It goes from small laughs at the beginning, small gags here and there, to a comedy of extraordinary proportions, when twists come one after the other – it is a crescendo.”
 - “You kind of hope that things will improve and that there'll be happy end, but there isn't really. You expect a happy ending, you want one, but it doesn't happen.”



Recommendations: Open Questions

- How to augment emotional models into existing recommenders?
 - Collaborative? Content-based? Conversational? Knowledge-based? Hybrid?
- Can we develop new emotion-centric recommendation methods?
 - User models + content annotation + recommendation requirements = ???
- What other recommendation related topics should be revisited?
 - Context? Personality? Groups? Diversity? Serendipity? Explanations?
- How should emotion-centric recommendations be evaluated?
 - Live study? Sensors? Evoked emotions? Timing? Intensity? Combined metric?
- In which domains can emotion-driven personalisation be applied?
 - Images? Music? Art? Tourism? E-Commerce? Advertisement? People?



**TALK
IS
CHEAP
JUST DO IT.**

Thank you!
Questions?

