



Multimedia Retrieval in PetaMedia: New Synergetic Paradigm

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Multimedia Information Retrieval (MIR)

- Facilitating semantic-level access to and handling of large multimedia content collections



Content I like anytime

... & ...



anywhere

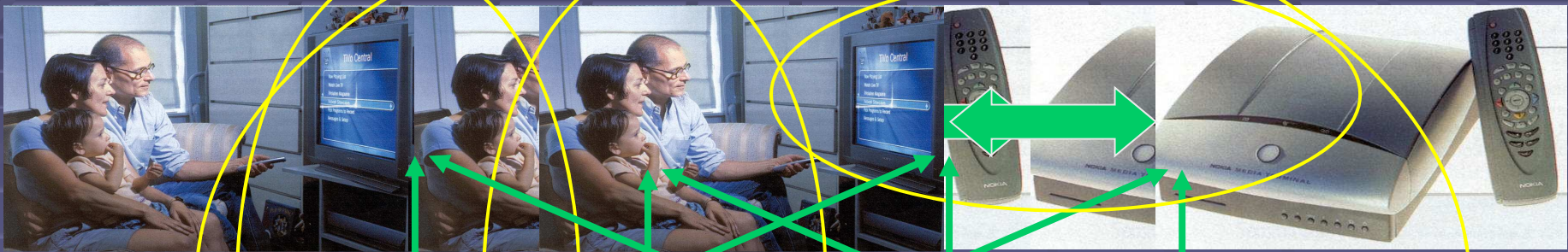
Quality of Experience

- User's subjective measure of the overall service provided
 - Different from Quality of Service (QoS)
 - Subjective versus objective
 - "...demands a fundamental mind shift away from "conveniently technical" to "humanly relevant" *
 - Mapping onto a technical challenge:
 - Efficiently providing access to the right content at the right time,
 - Access is easy, intuitive and natural for the user
 - Context-awareness
 - Maximizing the lean-back experience!
- effectiveness, unobtrusiveness, transparency

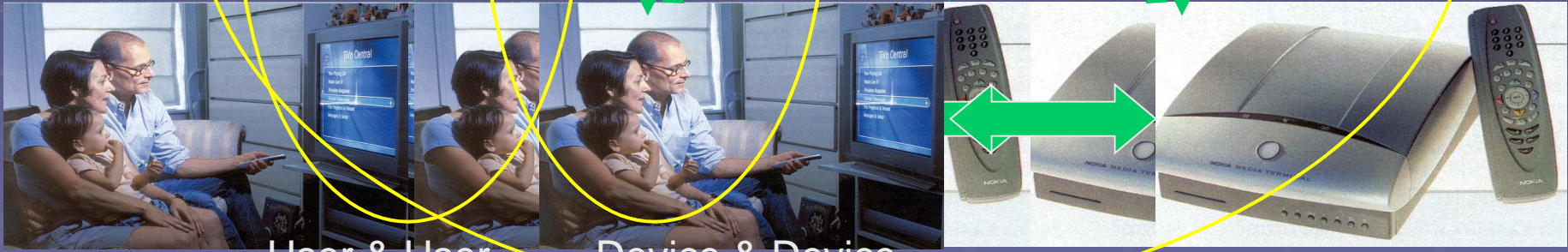
* D. Drogseth, Network World, 2006

New Synergetic Paradigm

User interaction User intelligence Device intelligence



User interaction User intelligence Device intelligence

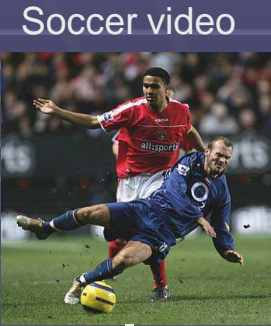


User & User

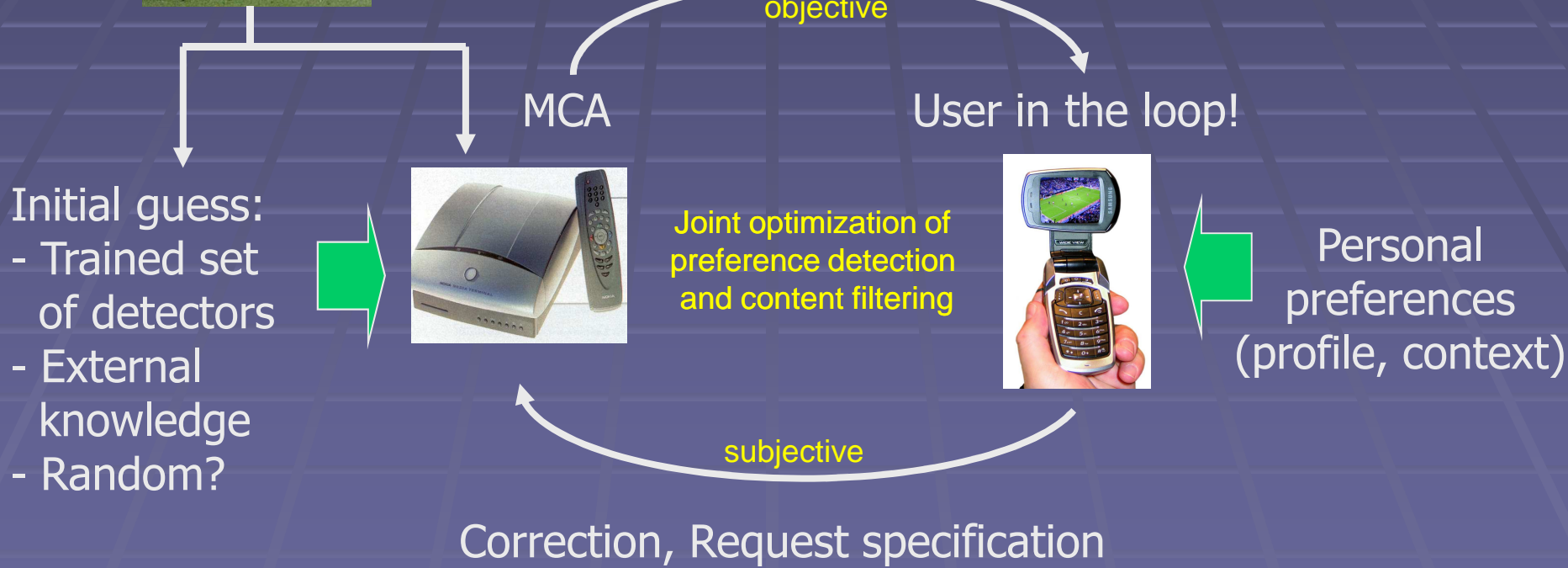
Device & Device

PetaMedia: Bringing three synergies together!

Synergy 1: User & Device



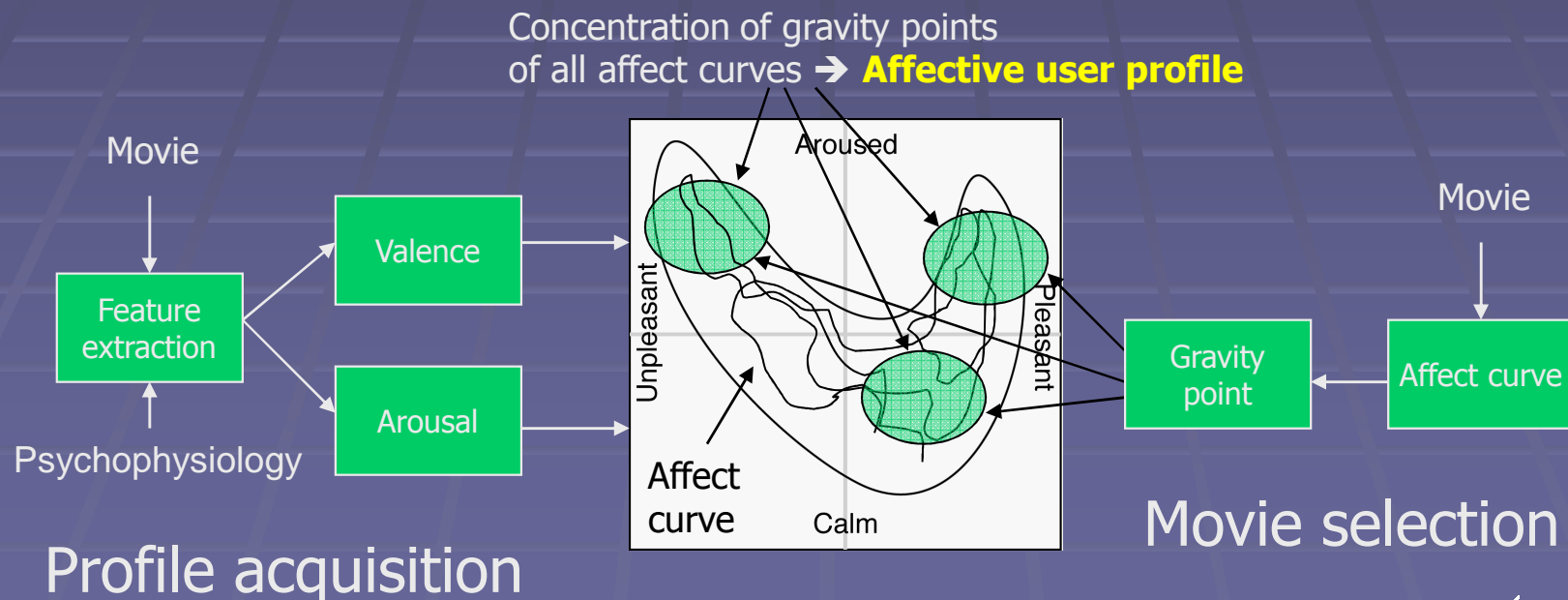
Best Educated Guess (BEG)
on "soccer highlights"



Natural & intuitive interaction for QoE-optimal MIR

Example: Affective User Profiles *

- “Expected” profile of a user through “affective MCA”
 - Modeling the Valence (“type” of excitement) together with Arousal (“Intensity” of excitement)
 - Combining the valence and arousal time curve into the **affect curve**
 - Affect curve \leftrightarrow changes in user’s affective state over time while watching multimedia content
 - Characterizing e.g. movies by their affect curves and collecting the curves’ gravity points

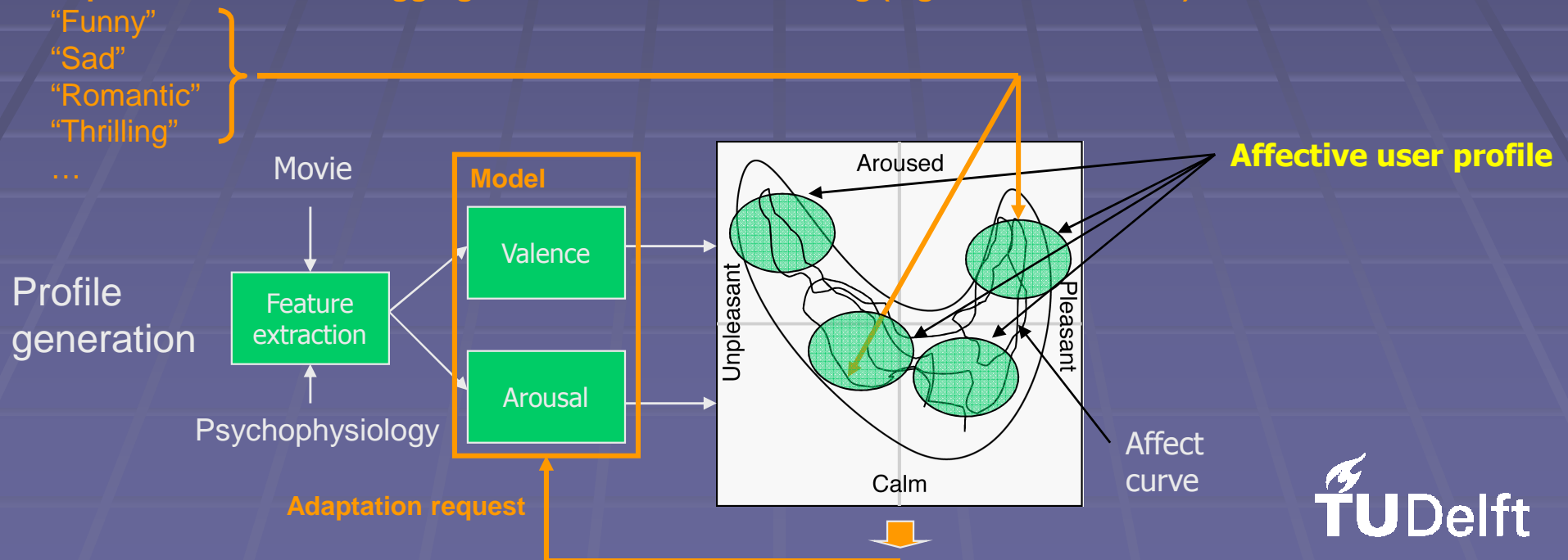


* A. Hanjalic: *Extracting moods from pictures and sounds, Towards truly personalized TV*
IEEE Signal Processing Magazine, March 2006

From BEG to Real Profile

- Initial affect curve likely to be suboptimal → a BEG
- Correction of BEG using implicit/unobtrusive information from the user
 - Face/gesture monitoring and detection
 - Brain signal monitoring and analysis
 - Social signal processing

Implicit/unobtrusive “tagging” based on user monitoring (e.g. BC/CV interface)



Synergy 2: User & Users

■ Emerging Social Networks

- Increasing popularity (e.g. >10 Million users of “Flickr”)
- Networks of human “peers” uploading, consuming and indexing content
- Individual indexing (e.g. Flickr, YouTube) or collaborative indexing (e.g. Del.icio.us, CiteULike, tagging games)

■ Power of social dimension

- Maximizing benefits of manual indexing (“explicit” tagging) while removing its negative sides (It’s fun to do it!)
- Scalability through enormous human resources available

→ Great revival of the “dead” concept of manual indexing!

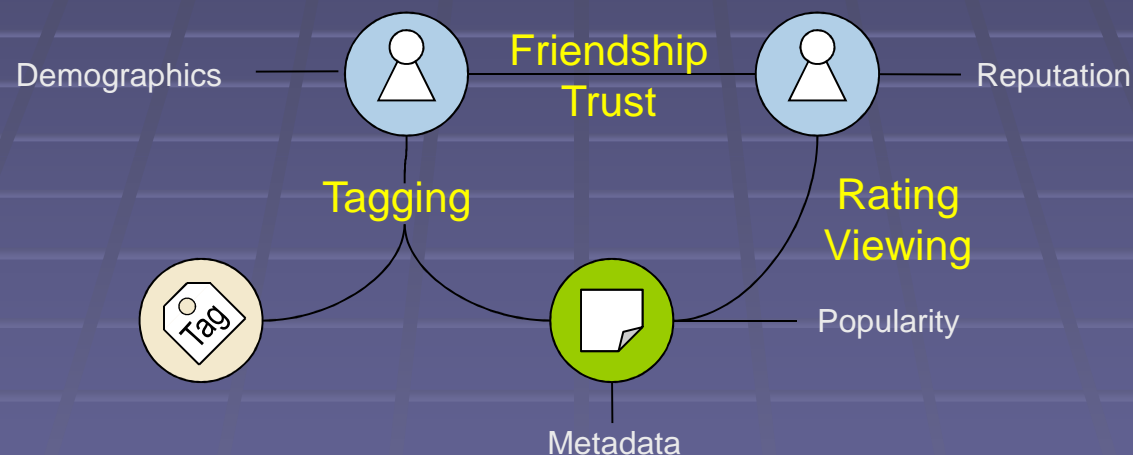


The Downside

- “Raw” tag sets are typically ambiguous, noisy, meaningless, misleading (spam!)
 - Many users & many, many tags
 - One user → tags for many items
 - One item → tags from many users
 - One user in several networks
 - ...
- Tagging is not enough ...
 - Incentive for people to tag still insufficiently investigated

Getting More from Tags

- Applying association mining to clean and optimize the tag sets
 - Best (reliable) tag clusters per item
 - Relations between tags (tag clusters) and between items → Tag recommendation *



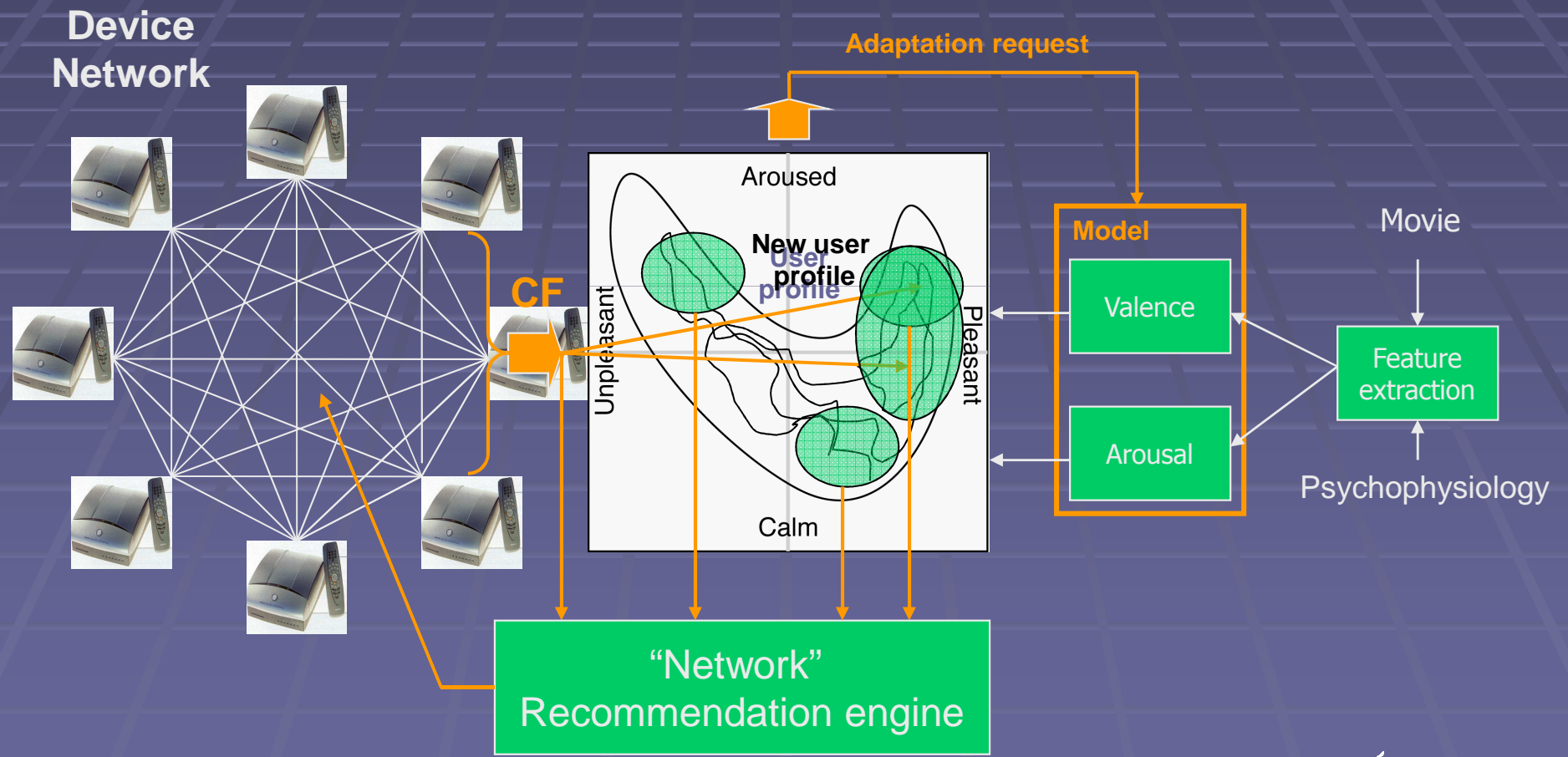
- And even more **
 - Modeling social relations between users (friendship, trust)
 - Inferring user group profiles
 - Improving tags through implicit rating/friendship/trust/group profile info

* Sigurbjornsson, van Zwol: *Flickr Tag Recommendation based on Collective Knowledge*, WWW 2008 conf.

** Figure: Courtesy of M. Clements, TU Delft

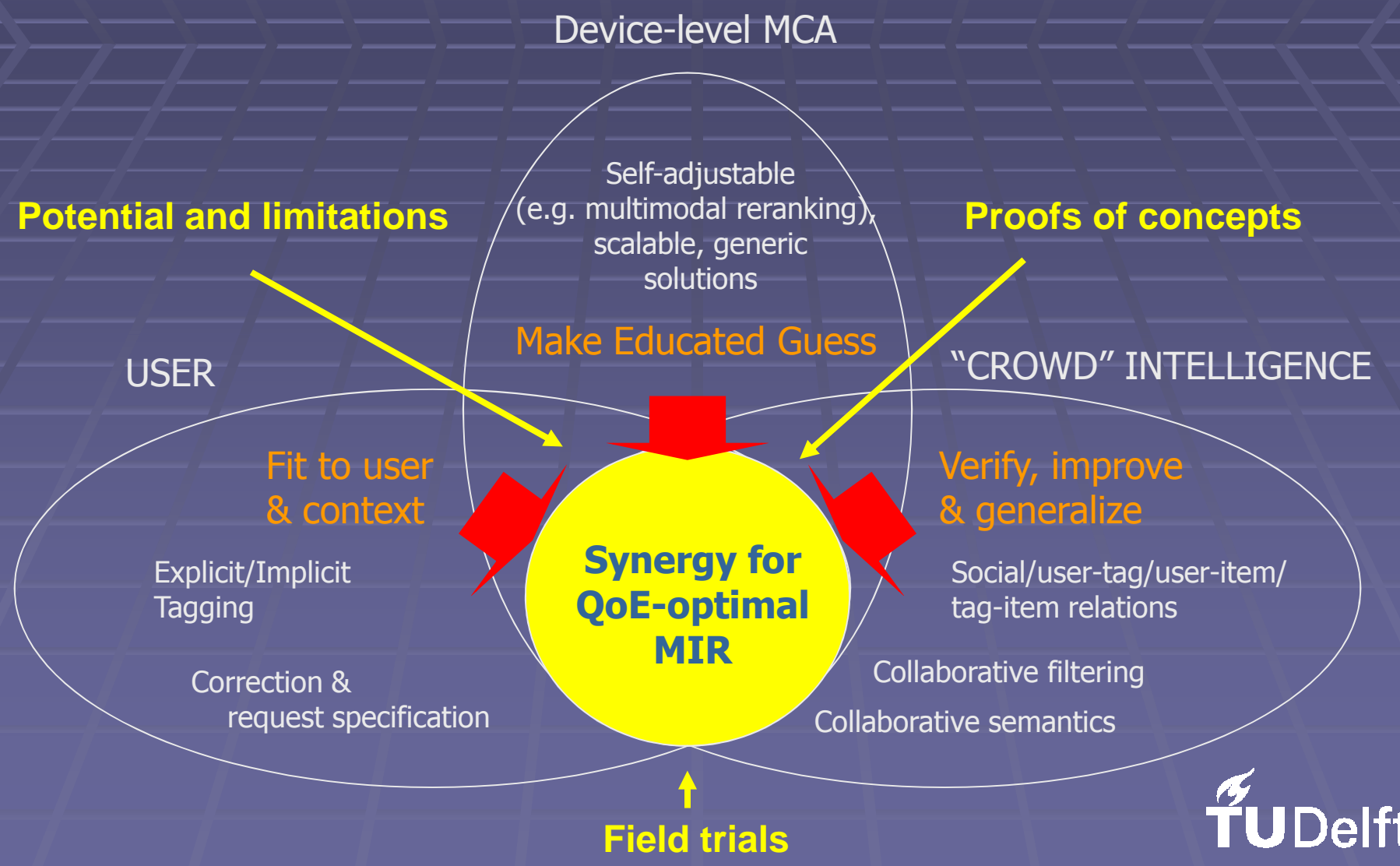
Synergy 3: Local & Collaborative Profiling

Example: Affective User Profile & Collaborative Filtering



Improved "network" recommendation through CF and "local" recommendation

PetaMedia 2008-2012



Thank You!

