
Recommendations in ubiquitous environments

Mobile applications

- **Mobile applications have been a domain for recommendation**

- small display sizes and space limitations
- naturally require personalized information



- **Since the end of the 1990s, research into mobile applications has focused heavily on adaptivity**

- **Nowadays, limitative circumstances are now starting to disappear**

- more powerful CPUs
- better displays
- modern wireless broadband

RS research questions in ubiquitous domains

- **What are the specific goals of recommender systems in a mobile context?**
 - do users expect serendipitous recommendations, or is it more important to be pointed to things that are close to one's current position?
- **What are the implications of contextual parameters such as localization for the design of recommendation algorithms?**
 - is location just another preference, a requirement that is always strictly enforced, or something in between?
- **What role does the modality of interaction play when addressing users "on the go"?**
 - pushing information can be useful to draw recipients' attention, but the users' permission is surely needed. how should permission protocols for "push" recommendations function?

Context-aware recommendation

- **Ranganathan and Campbell (2003) see context as**
 - "any information about the circumstances, objects or conditions surrounding a user that is considered relevant to the interaction between the user and the ubiquitous computing environment"
- **Shilit et al. (1994) name the most important aspects of context as**
 - where you are
 - who you are with
 - what resources are nearby
- **Context awareness is a requirement for recommender systems**
 - particularly relevant in ubiquitous domains
 - context as situation parameters that can be known by the system and may have an impact on the selection and ranking of recommendation results.

Application domains

- **M-Commerce**
 - m-commerce refers to monetary transactions that are conducted via wireless networks.
- **Tourism and visitor guides**
 - travelers have specific information needs, makes this domain a natural choice for mobile information systems.
- **Cultural heritage and museum guides**
 - mobile guides for archeological sites or museums providing multimedia services.
- **Home computing and entertainment**
 - users are able to personally configure and adapt smart devices in their environment based on their preferences and on specific situations.

Common model of UbiComp

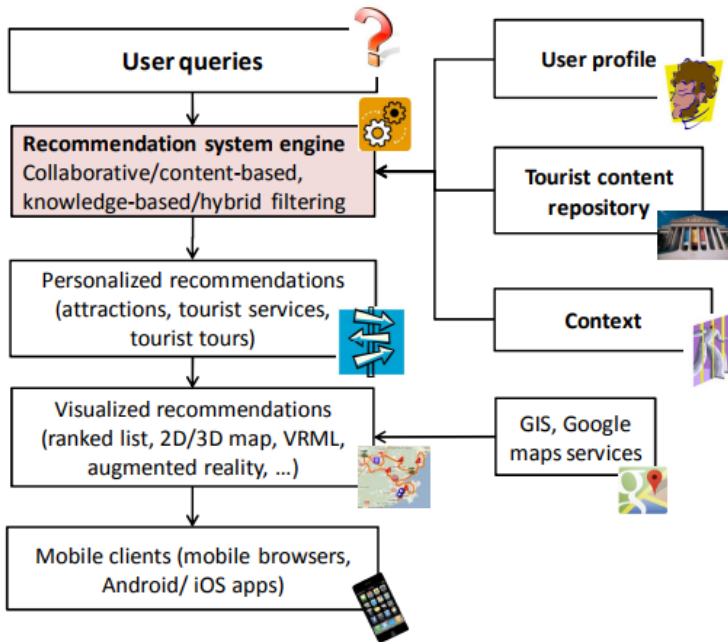


Fig. 1. A generic architecture of a mobile tourism RS.

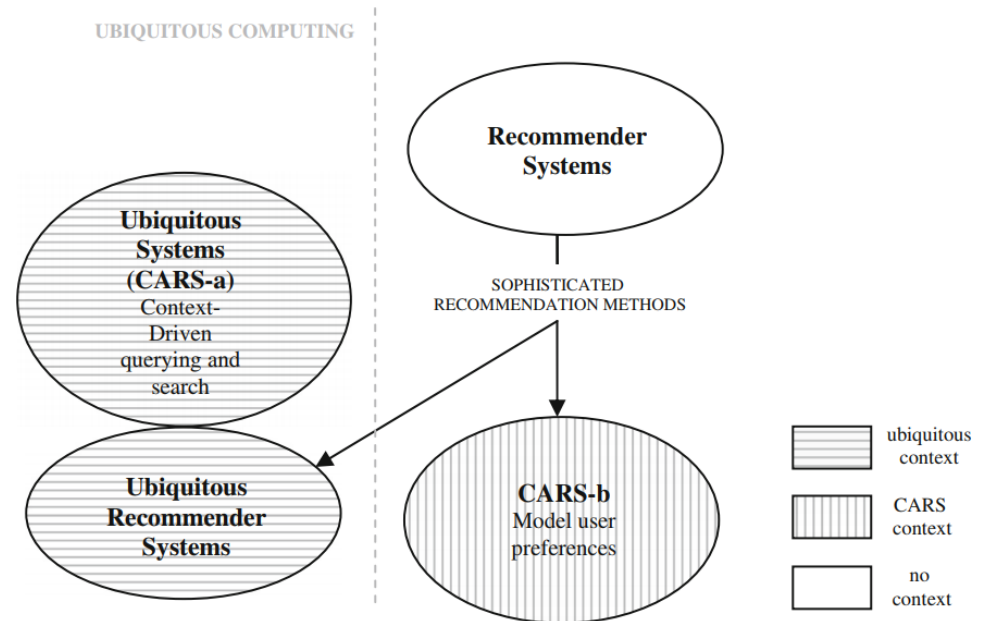


Fig. 1 Classification of Ubiquitous Recommender Systems domain

Summary

- Rapid technical advancements toward ever more powerful mobile devices
- Ubiquitous applications constitute a promising domain for different types of personalization and recommendation
- **Tourism application domain is by far the most active field**
- bottleneck: technical interoperability between ubiquitous devices themselves and the **privacy concerns of users**

- **Recommended reading:**

<http://ai2-s2-pdfs.s3.amazonaws.com/ee26/7ea09ccf64d75ea6bdabc81a2223da1ef233.pdf>

<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6579536>

Literature

- **[Ranganathan and Campbell 2003]** An infrastructure for context-awareness based on first order logic, *Personal Ubiquitous Computing* 7 (2003), no. 6, 353–364.
- **[Shilit et al. 1994]** Context-aware computing applications, *Proceedings of the 1994 First Workshop on Mobile Computing Systems and Applications (WMCSA '94)* (Santa Cruz, CA) (Maria Sigala et al., ed.), IEEE Computer Society, 1994, pp. 85–90.