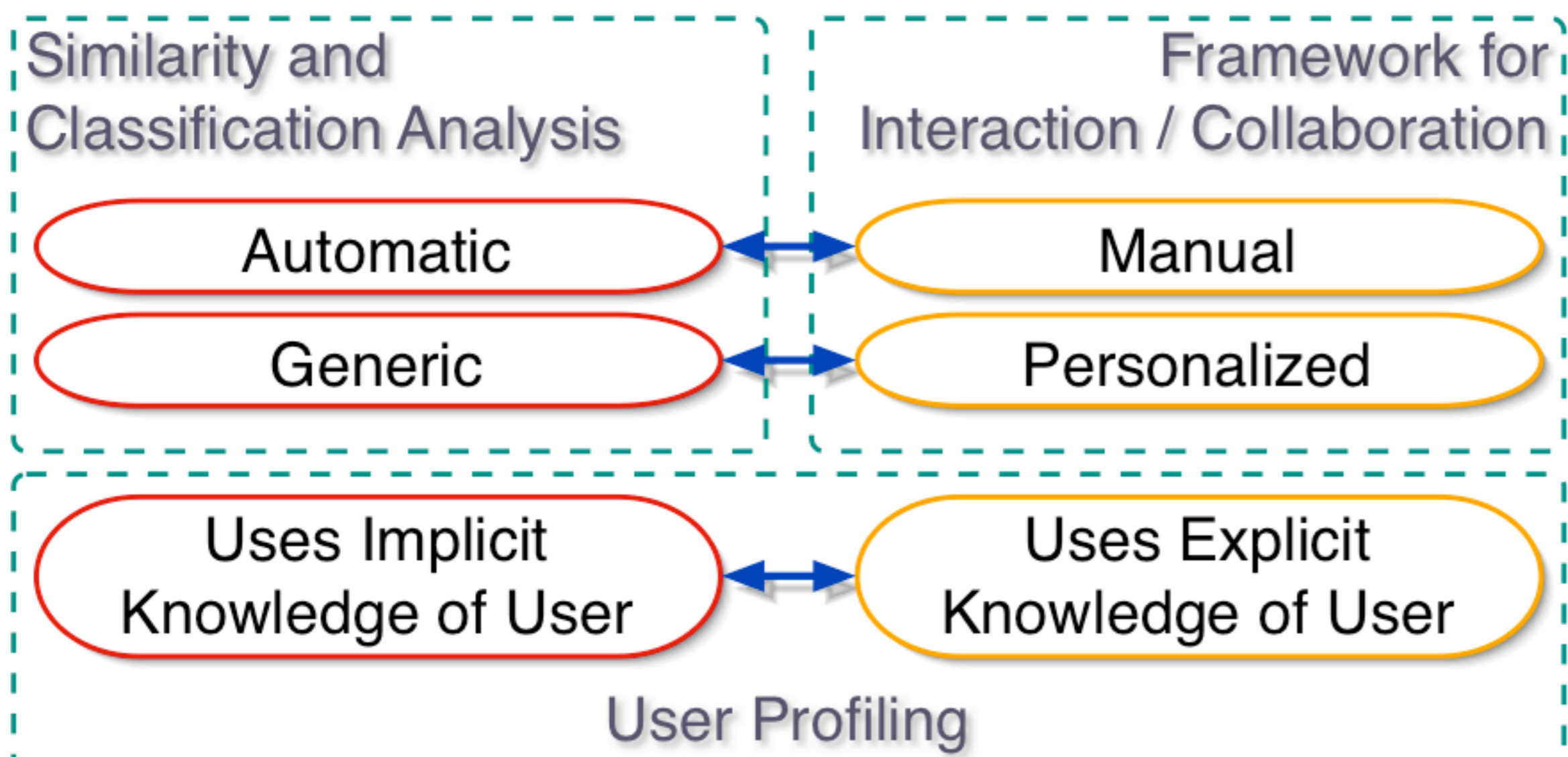


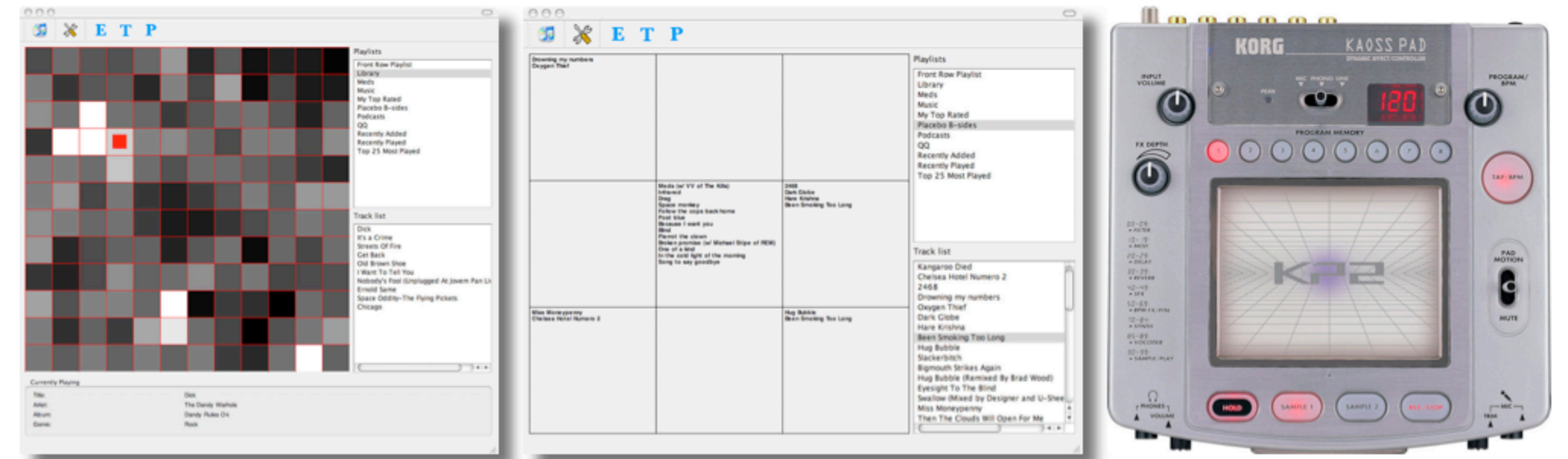
MUSIC BROWSING USING A TABLETOP DISPLAY

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Design Considerations for a Software Music Browser



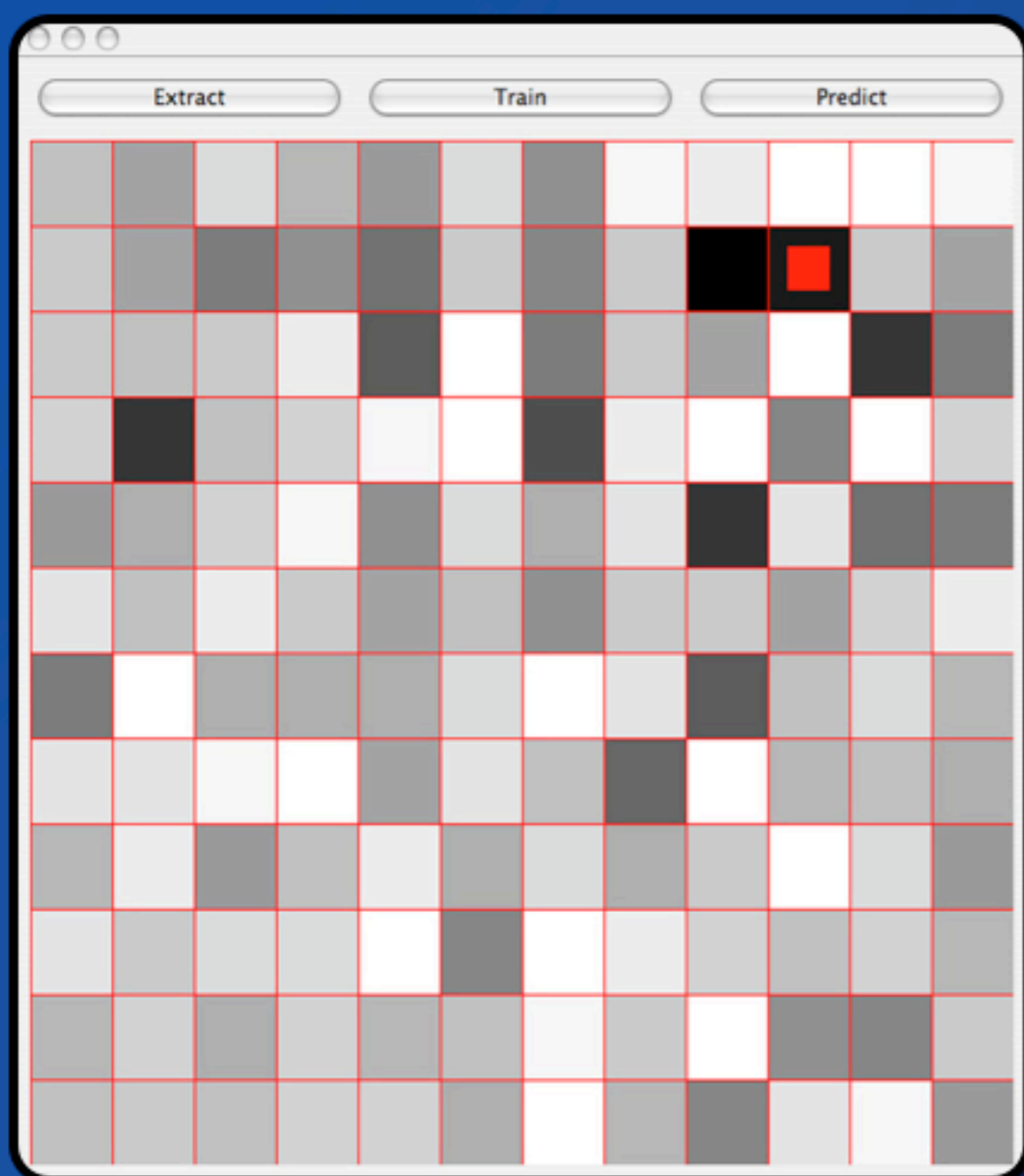
Alternative Interfaces



MarGrid application illustrating meta-data imported from iTunes (XML) library file.

Keypad interface for MarGrid using a tree-like structuring scheme suited for cell phones, PDAs, etc.

KORG KAOSS MIDI controller with audio-only user interface



Qualitative User Study

Objectives: To obtain qualitative feedback regarding the...

1. Usability and affordances of 2 interaction paradigms based upon a SOM for similarity analysis and a tabletop interface
2. Nature of the collaborative interaction among multiple simultaneous users of a tabletop music browsing system

Participants: 9 university students organized into groups of 3

1. Three non-computer science undergraduate students
2. Three computer science undergraduate students
3. Three computer science graduate students

User Study Organization: Three phases, each using the Mitsubishi DiamondTouch and the same collection of 100 tracks (without meta-data):

1. iTunes application without meta-data
2. MarGrid application using "Click-to-Play" interaction
3. MarGrid application using "Continuous Feedback" interaction

Follow-Up Focus Group

Qualitative Data Collection: Audio and Video from 3 Phases and Focus Group

Results:

Phase 1 : iTunes without meta-data

- Absence of meta-data noted by all participants
- Tendency to seek out an underlying structure within the collection
- Some frustration surrounding excessive use of scroll bars

Phase 2 : MarGrid using "Click-to-Play" interaction

- Over time, users used adjective pairs (often unrelated to genre or musical style) to describe contrasting regions of the SOM map (e.g. "rude" vs. "polite" corners; "soft" vs. "hard" regions)
- Significant conversation surrounding track and artist identification
- While the SOM mapping was not always intuitive, participants felt it provided a better sense of the overall collection content than iTunes

Phase 3 : MarGrid using "Continuous Feedback" interaction

- Participants were significantly more animated than in Phase 2
- Participants used the tabletop as a type of musical instrument in order to "play with sound", rather than using it to browse the collection (potential application to DJing or mixing)
- Participants at times felt they were "fighting for control" of the tabletop
- Some participants expected the table to "obey the laws of physics"
- More entertaining, but users felt browsing was more effective with "click-to-play"

Conclusion:

Overall reaction to MarGrid was positive. Users indicated that adapting to the tabletop interface was simple, and that the experience was enjoyable.

While the "continuous playback" paradigm produced the most animated, collaborative, and enjoyable user experience, it did not facilitate the most effective music collection browsing. The "click-to-play" paradigm showed greater potential for browsing; interaction between users was facilitated, and consensus was met more frequently.

Similarity Analysis

2 Dimensional Self-Organizing Map (SOM) using Automatically Extracted Audio Features (Marsyas Framework)

User Interaction Paradigms

We explore the use of a large multi-touch tabletop display (Mitsubishi's DiamondTouch).

Music tracks are mapped to nodes of the SOM. The track 'density' of each node is represented visually via grayscale intensity or alternative colormap.

Consecutive user clicks cycle through tracks mapped to the same node.

Two Interaction Paradigms:

1. Click-to-Play
2. Continuous Playback

Personalization Mechanisms

Import iTunes Library (XML) with Associated Meta-Data

Explicit Initialization of the SOM by the User via Drag 'n' Drop Functionality



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