MASTER IN COMPUTER SCIENCE

MultiTunes

Multimodal Interfaces

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Introduction

CASE & CARE

Technologies

Accelerometer

Voice Recognition

Demonstration

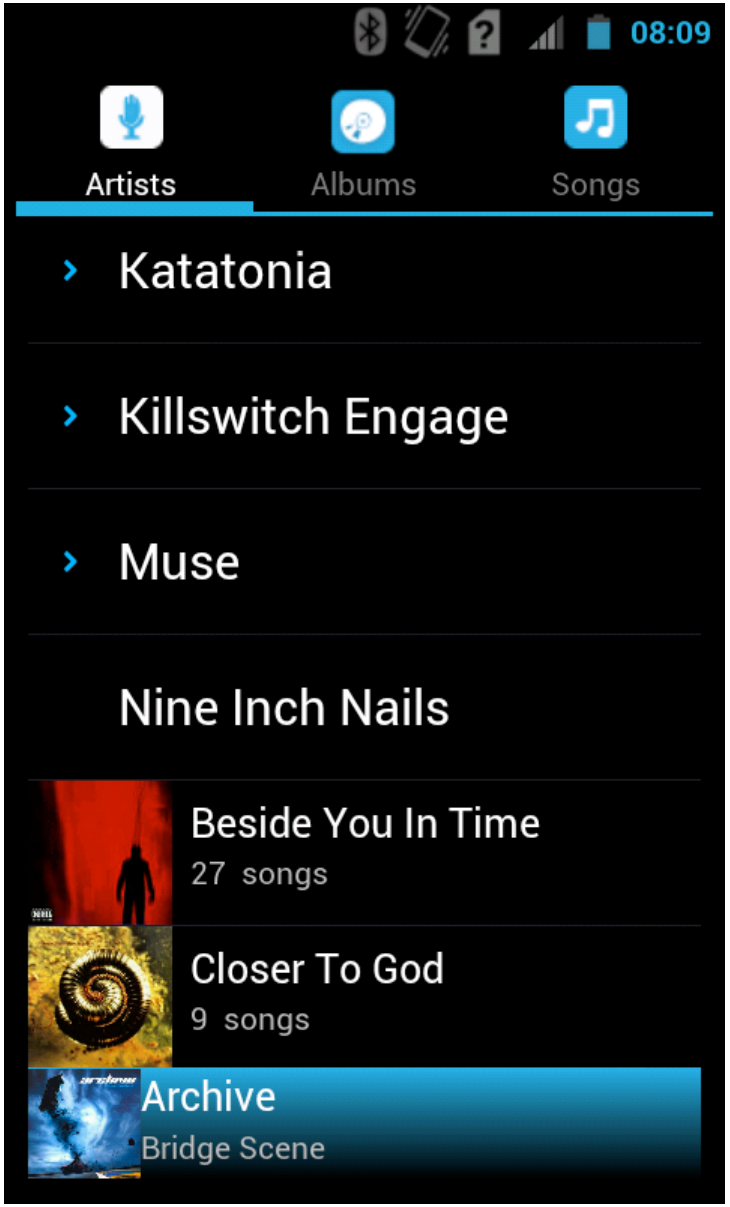
User Evaluation

Introduction (1/5)

- Music player for Android
  - Gathers music stored on the device's SD card
    - Processes informations like artist, album, duration, etc.
  - Contains functionalities of most music players
    - Play/Pause
    - Next/Previous
    - Repeat song/all, shuffle
  - Touch, gesture and speech

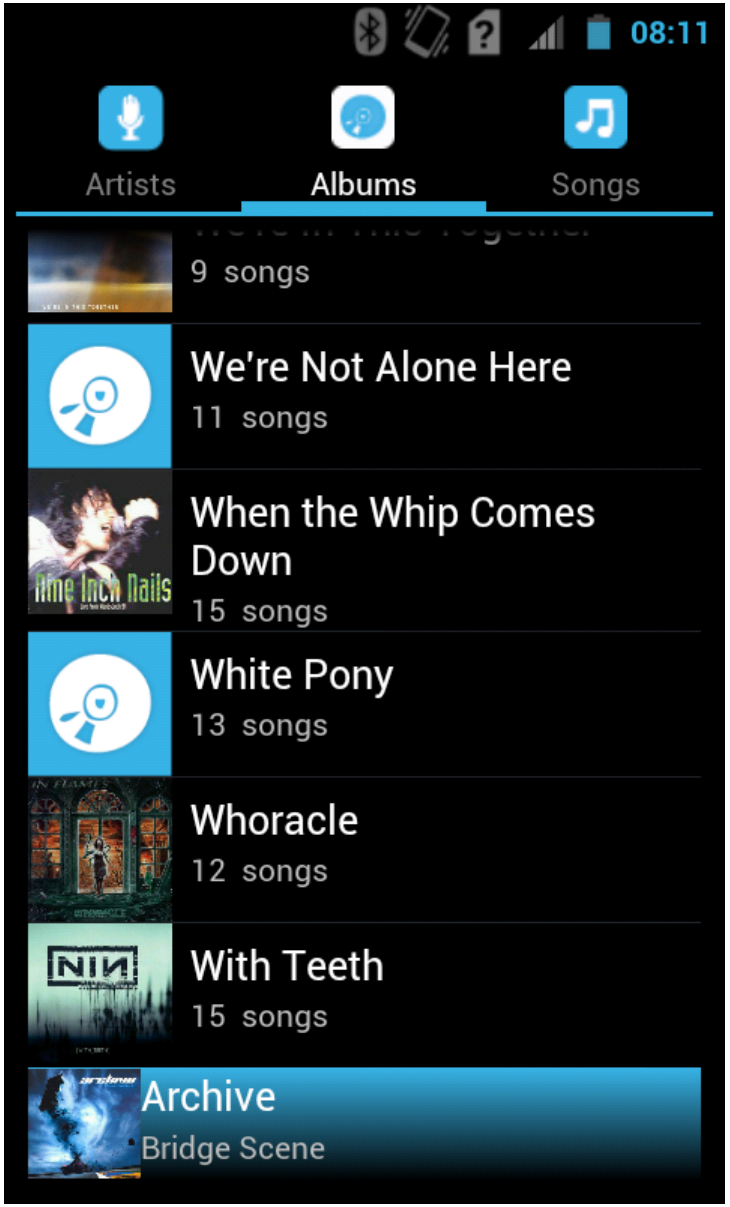
Introduction (2/5)

- List of artists
  - Display albums
    - Album cover
    - Number of songs
- Currently played song



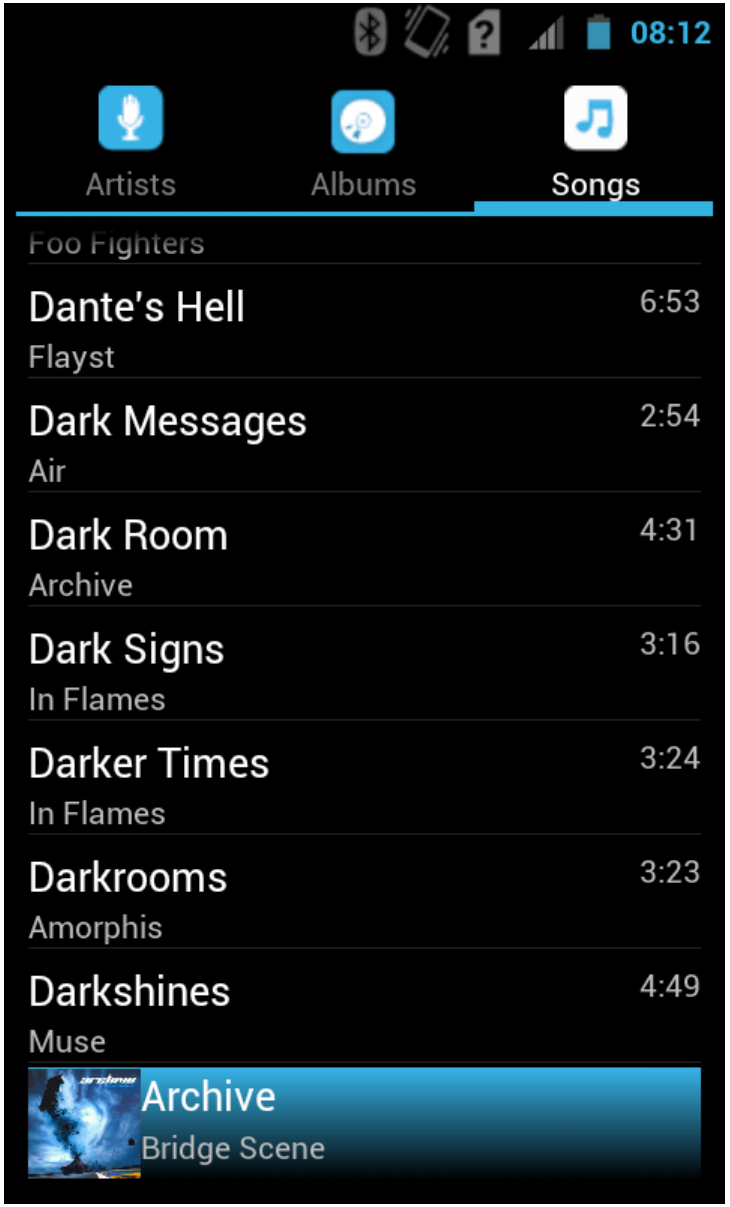
Introduction (3/5)

- List of albums
  - Album cover
  - Number of songs
- Currently played song



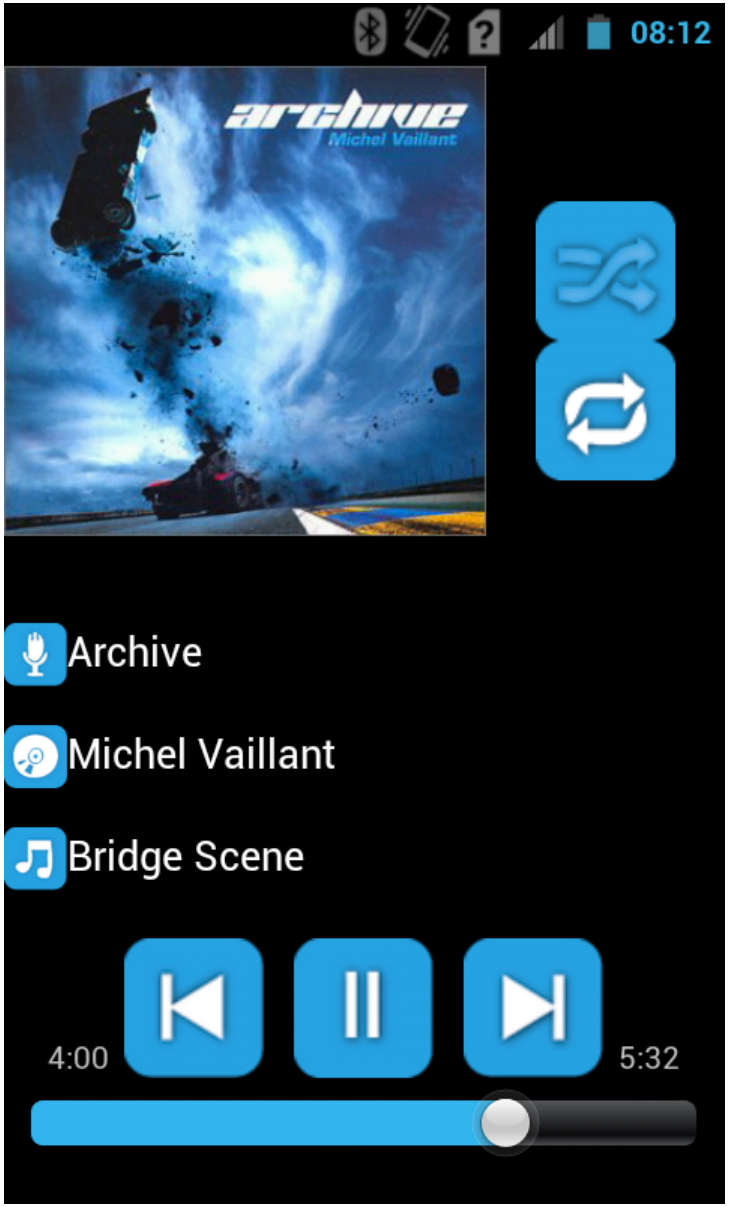
Introduction (4/5)

- List of songs
  - Artist
  - Duration
- Currently played song



Introduction (5/5)

- Music player
  - Currently played song
    - Artist, album, song title
  - Functionalities
    - Play/Pause
    - Next/Previous
    - Repeat song/all
    - Shuffle



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CASE

- Communication of multimodal interaction on machine-side

		Use of Modalities	
		Sequential	Parallel
Fusion of Modalities	Combined	**A**lternate	**S**ynergistic
	Independent	Exclusive	**C**oncurrent

CARE

- Assignation
  - Context assignation
  - Driving: in-car mode
  - Public: in-pulic mode
- Equivalence
  - Most of the functionalities
  - Play/Pause/Next/Previous/Random

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Technologies

- Android
  - SDK
  - API 2.3.7
  - Eclipse + Mercurial
- Devices
  - HTC Desire
  - HTC Desire S
  - Sony Xperia S

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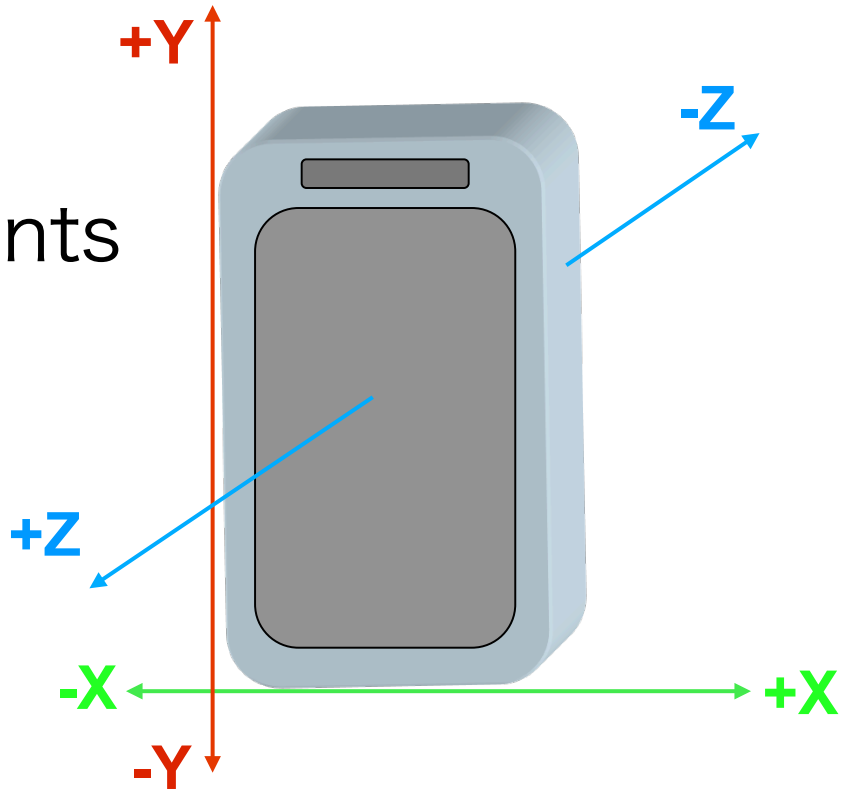
Accelerometer

- Public transport mode
- Subscribe to system events
- SensorEventListener
  - onSensorChanged()
  - Values for X, Y, Z



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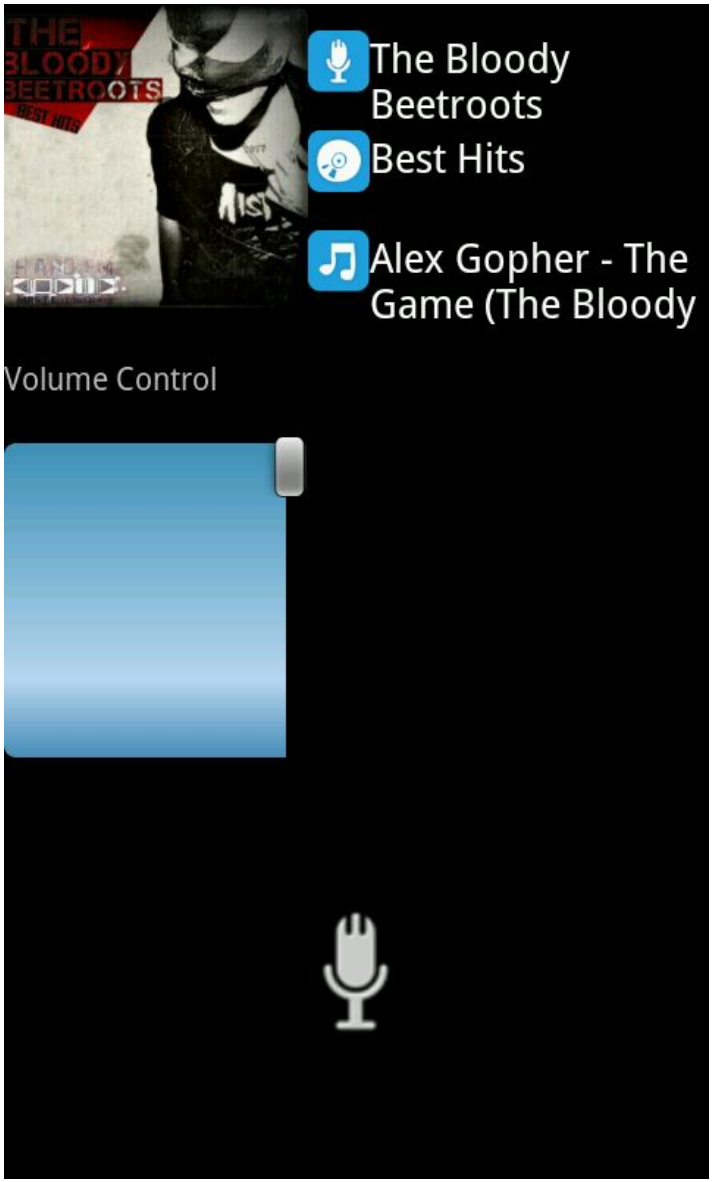
Voice Recognition (1/4)

- Motivations
  - Hands are fairly occupied
  - Not focus on the mobile
- Properties
  - Simple interface
  - Provide user with feedback
  - Error handling

Voice Recognition (2/4)

- Shared media player
- Change media player's volume
- Icon to start the voice recognition



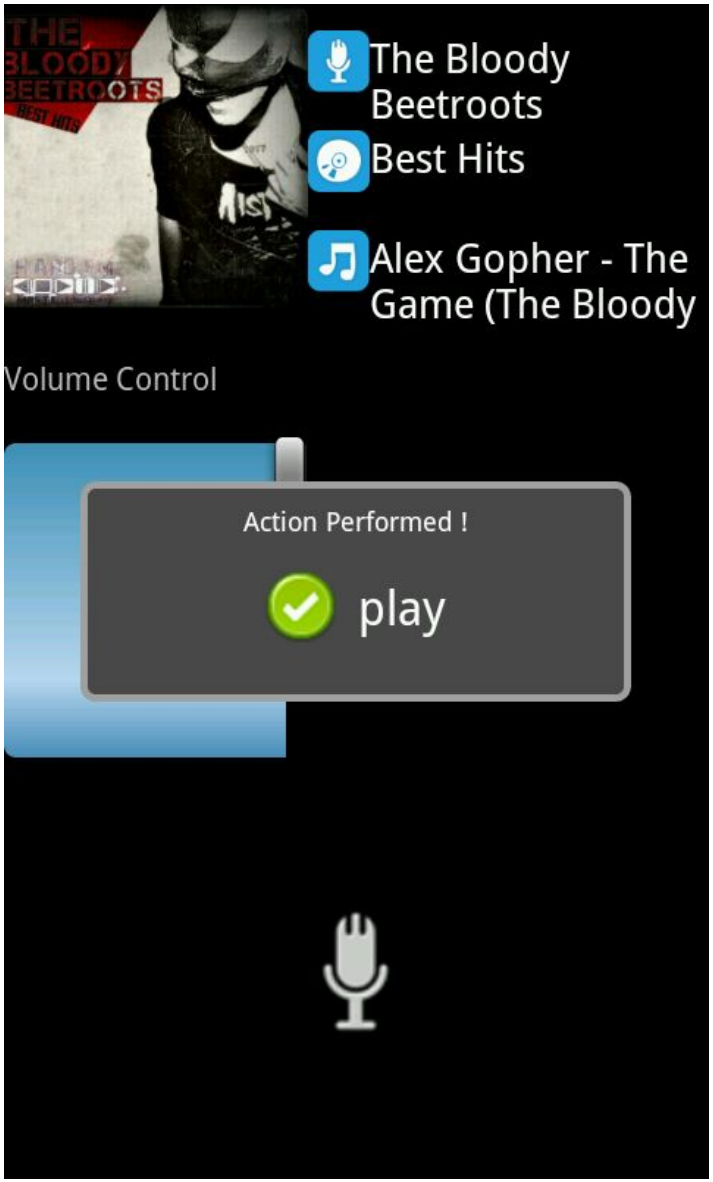
Voice Recognition (3/4)

- *RecognizerIntent* Object
- Free form english based

Functionality	Keyword
Begin to listen to music	play
Go to the next song	next
Go to the previous song	previous
Play a random song	random

Voice Recognition (4/4)

- User feedback
  - Ok: *Toast* notification
  - Not ok: repeat keyword
- Error handling
  - Accelerometer disable
  - List of words per functionality



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User Evaluation

- Qualitative evaluation
- Observation method
- In lab
- Evaluator takes notes
- Short interview
- One user in real driving context

User Evaluation
Participant's profile

N°	Level	Is on android?	Context
1	Novice	Yes	Lab
2	Medium	Yes	Lab
3	Expert	Yes	Lab
4	Novice	No	Lab
5	Medium	No	Lab
6	Expert	No	Lab
7	Expert	Yes	Lab & car

User Evaluation
Scenarios

- Small demonstration
- 2 differents scenarios
  - In-car mode
  - In-public mode
- Interviews
  - 3 questions

User Evaluation
Results & Feedback (1/2)

- Relevant remarks and comments
- Non-android users don't understand how to switch between mode
- Speech recognition rate must be improved
  - French accent
  - Noise robustness
  - Distance between speaker and device

User Evaluation
Results & Feedback (2/2)

- Need a user manual
- Convinced by the application
- Very interesting
- Anyone can use the application

Thank you for your attention.