Speech in the Car: Improving User Satisfaction

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User satisfaction data
UI in car goes much beyond VUI
User satisfaction – accuracy, latency, grammars
Speech, gesture, and touch are natural
UI for discovery
HMI design guidelines
2012 Navigation Usage And Satisfaction Study
-- J.D. Power and Associates (1/11/13)

- Study clearly shows that drivers want speech
  - 67% of the users without speech – want it
  - 80% of the users with speech – want it again

- Speech scored lowest satisfaction score in study
  - Significantly worse that 2\textsuperscript{nd} lowest score
  - Most frequently reported problem in the study
2013 Initial Quality Study
-- J.D. Power and Associates (6/19/13)

- 83,000 2013 vehicle owners surveyed
  - People want speech, but are not satisfied
  - Worst satisfaction score in the study

Other data suggests need to improve usability
- 2013 Texas A&M driver distraction study
- 2013 University of Utah driver distraction study
Human Modalities for User Interfaces

Communication to Device

- Gesture
- Speech
- Touch

Communication to User

- Vision
- Sound
- Haptic

ENTRY

PRESENTATION
Speech Input in the Car...

- Critical for entering text
  - Good for making requests
  - Avoids typing while driving

- Good for long-list item selection
  - Only when the user knows what is valid
  - Good for shortcuts

- Generally not good for menus

- Good for confirmation

- Increases task completion time
Accuracy and Latency are Both Critical
Usability and Grammar Size

Directed Dialog

Trough of Bewilderment

Humans

???
Icons: Discovery and Task Selection

- Drivers are accustomed to Icons
  - Mobile device usage continues to grow
  - Touchscreens in cars is a trend

- Icons are easy to understand and remember

- Icons are easy to scan

- Adding text helps speech UI
UI for Content Discovery

Satellite radio example…

Replace with Discover
Iconography for Content Discovery

Tap, Say, or Gesture

(2 pages of categories)
Iconography for Content Discovery

Tap, Say, or Gesture

- Elvis Radio
- E Street Radio
- Underground Garage
- Pearl Jam Radio
- Grateful Dead Channel
- Radio Margaritaville
- Classic Rewind
- Classic Vinyl
- Deep Tracks
Guidelines for the Best Automotive UI

• Maximize simplicity
• Minimize # of task steps and menu layers
• Avoid voice menus
• Use speech for text entry and disallow typing
• Minimize incoming messages
• Maximize interruptibility
• Minimize verbosity
• Remove need for learning mode
• Minimize glance duration and frequency
• Minimize task completion time
Speech Button Task Initiation

“Tap or say your selection”

Scenario 1:
User taps weather icon

Scenario 2:
User says “weather”

Scenario 3:
User says “What’s the forecast for tomorrow?”
User Experience Goal:

- Simplicity and low driver distraction
- Intuitive and interruptible
- Minimize task completion time
Thank You