

“Go There!”

Large Information Space Testbed V1

Multimodal Interaction with a Static Map

Motivation

This demo allows the user to navigate on a large map using a combination of gestures and vocal commands. The main objective is to enrich the OI platform with new single (speech) and combined (gesture + speech) modalities. A secondary objective is to demonstrate that the OI platform allows the implementation of the classical put-that-there paradigm in a pervasive environment.



Modalities

There are two versions of this demo using different gesture recognition systems. The first one is based on a camera-based fingertracker with an infrared camera system. The second version uses the DiamondTouch™ table. The MERL DiamondTouch™ table is a multi-user, touch-and-gesture-activated screen. Both versions use a speech recognition solution.



Evaluation

Users had to find specific places on the map using multimodal inputs. Findings:

- The OI environment should provide rich feedback to the user so that the user can better understand whether their speech input was recognized and in this way, learn how to improve their experience of the interaction.
- The system makes all users more interested in multimodal interaction.
- Once a voice command works, users tend to stick with it.

Using the Demo

Voice interaction:

“Zoom in”, “Zoom out”, “Show map”
“Up”, “Down”, “Left”, “Right”

Voice + Gesture interaction:

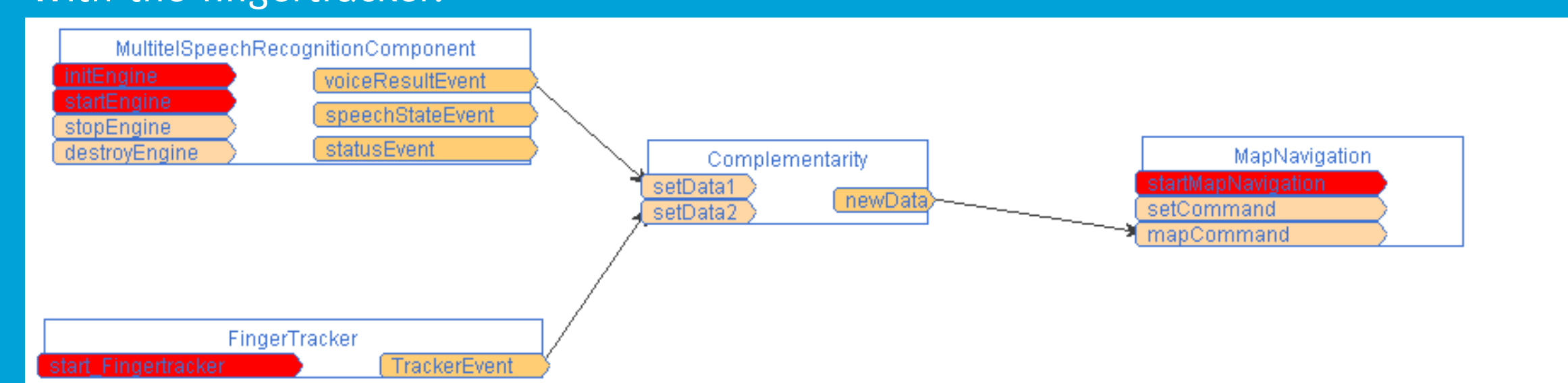
“Go there”, “Zoom here”, “Center”

The demo starts with a large display of the map. You can say “zoom in” or “zoom out” or touch the map and say “zoom there”. If you want to zoom in to the maximum in one step you can touch the map and say “Go there”. If you want to navigate, you can say the direction you want to move to or touch the map and say “center”. If you want to come back to the original large display, just say “Show map”.

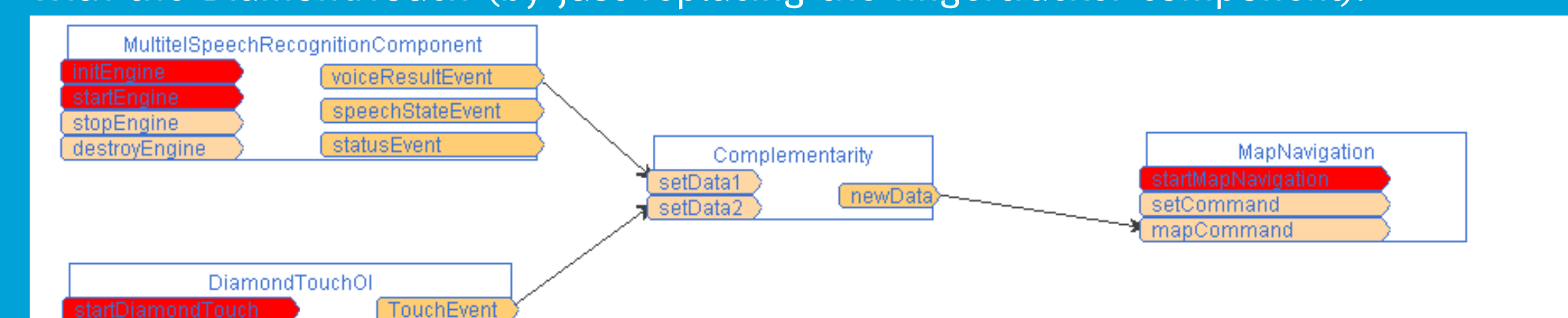
Demo Architecture

This demo is an example of data complementarity fusion. Basically, it makes a fusion of the point (x, y) coming from the gesture device and the string coming from the vocal recognition.

With the fingertracker:



With the DiamondTouch (by just replacing the fingertracker component):



Other possible architectures can be used for testing and prototyping:

- Device simulation: The gesture component can be exchanged by the mouse component.
- Software simulation: The speech recognition can be exchanged by a string generator component (allows the user to type inputs in a dialog window).

- The specialisation of the user on a specific modality is an experimental confirmation of the U-preference properties (U-Assignment).
- The OI platform is a good tool for implementing multimodal applications in a user-centred design process by allowing fast prototyping of multimodal interaction and by testing different interaction techniques.