No Contact Navigation

Developing Gesture Sets for Navigational Tasks

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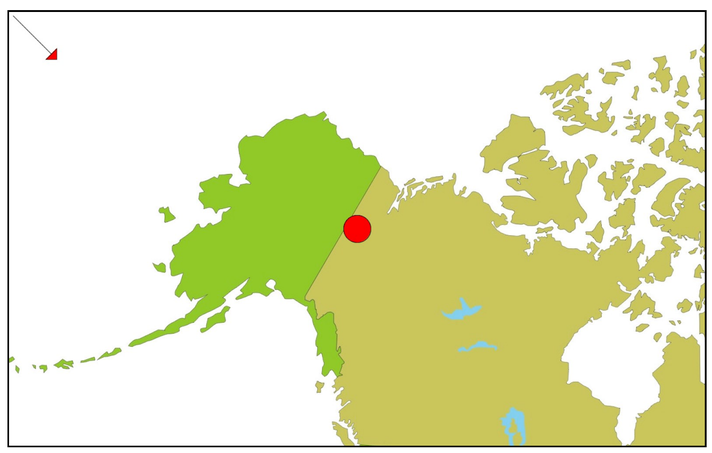
Gesture-Based Navigation

With the rise of VR and non-contact interaction comes the need for a standardized set of gestures to perform everyday navigational tasks. This future standard for gesture-based interaction must be efficient, while conveying a natural feel to the user. We compared two gestures to perform each of the three most common navigational tasks: zooming, panning, and selecting.

Leap Motion Bar

The Leap Motion Bar is a USB device that tracks the movement of hands and fingers as they move in open space. We translate this information into detectable gestures that translate to either zooming, panning, or selecting. The Leap Motion Bar is an inexpensive device that demonstrates the possibilities of no contact interaction with the computer.

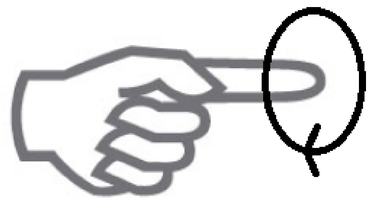


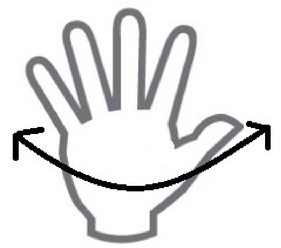
Future Work

Our results and favourable study participant opinions on the gesture-based input technology demonstrate that it has potential for implementation on a wide scale. We believe a standardized gesture set will be an important part of this implementation. Therefore, further research into specific gestures will need to be performed. It's important to note that this type of interaction will bring across new needs for accessibility issues, which will also require further study.

Zooming

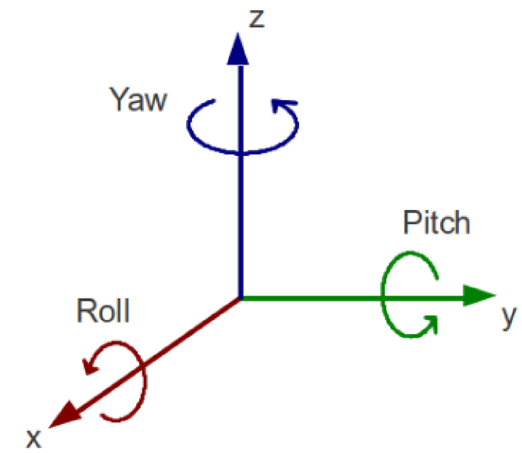
The two gestures tested for zooming include performing a circle with the index finger, and rolling the hand back and forth. While the circle gesture was significantly better in both error rate and time to complete a task, the majority of users surveyed preferred the rolling gesture.





Panning

The gestures tested for panning included moving the hand towards the edges of the screen, and rolling the hand around the yaw axis. Neither gesture performed significantly better than the other, and users surveyed were split 50/50 on preference.



Selecting

To test selection gestures, users had feedback on the screen of where their hand was pointing. To perform the selection either an index finger-thumb pinch or a fist gesture was made. While was no significant error rate or time difference between the gestures, users preferred the fist selection.