Applying Tactile Languages for 3D Navigation

Victor Adriel de Jesus Oliveira and Anderson Maciel
Instituto de Informática - Universidade Federal do Rio Grande do Sul - UFRGS

Assessment of Tactile Vocabularies

We propose the use of prefixation as an approach to increase the tactile vocabulary expressiveness. User experiments were conducted to analyze the effects of prefixation on the user’s performance.

We designed and evaluated three alternative tactile vocabularies to support navigation in 3D environments. We also designed a vibrotactile display to deliver the tactile information.

Tactile Belt

The vibrotactile display was constructed with eight electromechanical tactors. They were positioned at equidistant locations, so the user can identify each one when wearing them around the waist as a belt.

User Study

After a training section, the user performed a perceptual task and an interpretation task. Then, users navigated in four different scenarios. The lighting was uneven and its intensity decreased along the path to encourage tactile guidance.

The experiment results showed that the group that used the third vocabulary performed better. This vocabulary was the one with prefixation and had only one pattern delivered as a sequence.