Expressy smartwatch

Using a Wrist-worn Inertial Measurement Unit to add Expressiveness to Touch-based Interactions

Mobile Infomation Systems, CSM
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Goal

“How data about hand movement provided by a motion sensor similar to those found in many smartwatches or fitness trackers can be used to expand the expressiveness of touch interactions”

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Key factors

- Acceleration: the rate at which a hand changes its speed
- Roll: the angle of rotation of the hand, defined with respect to an axis that runs through the user's palm, wrist and forearm.
- Pitch: the angle between the user's hand and the horizontal plane of the touch screen's surface, defined with respect to an axis through the user's palm, wrist and forearm

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Hand model

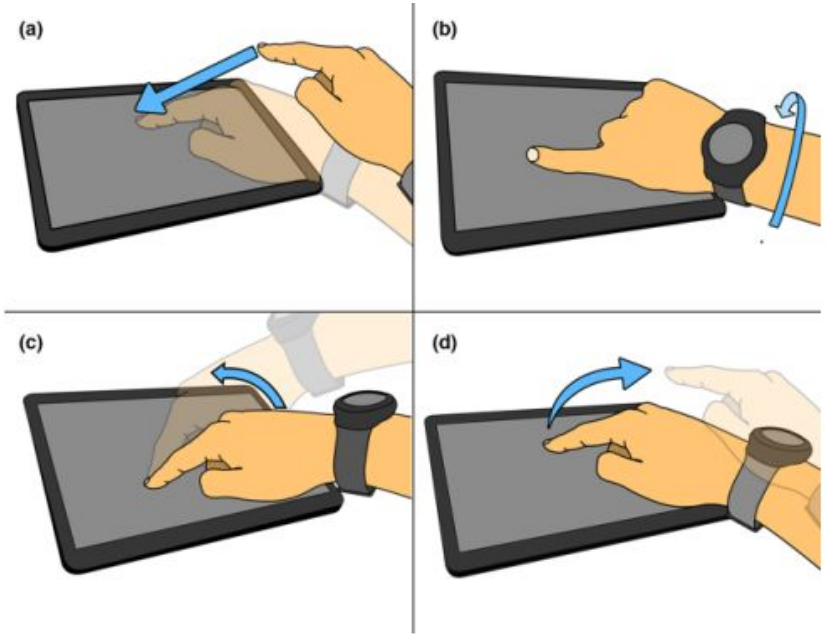

Figure 3. Hand model: (a) Tap Force, (b) Roll, (c) Pitch, (d) Flick Force.

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Pebble Classic

The Pebble Classic model was used

- Bluetooth 4.0
- Accelerometer sensor (two modes: “Data batches” and “Taps events”)
- Pebble C SDK 3.14
- The raw data was sent to the smartphone with the maximum 100 Hz rate and 1 sample per batch/callback

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Android smartphone

Android 6.0.1 smartphone was used

- PebbleKit Android 3.0.0
- AppMessage is a bi-directional messaging subsystem of Pebble SDK that enables communication between phone app and Pebble watchapp

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Thank you!

References

1. developer.pebble.com
2. developer.android.com

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