Selected Topics in HCI

Fall Semester 2025

Disclaimer

!! WARNING !!

Use your common sense when testing your app for this exercise, i.e. only test it *over a soft surface* and/or thoroughly wrap your phone in *shock-absorbing material* such as bubblewrap. Limit your throws to heights of 1-2 meters at most, which is best achieved by testing indoors, e.g. over a bed or sofa. Neither me nor the university have any responsibility for damaged phones or injuries.

Exercise 03 - Sensors and Tracking

Write an app that measures how high you can throw your phone, assuming a throw straight upwards without significant rotation. This is inspired by the "Send Me To Heaven" app, which has been banned on iOS but remains available on Android.

Part of the exercise is figuring out how to achieve this - as a starting point, import the `sensors_plus` package in your app project and subscribe to `AccelerometerEvent` updates (*not* `UserAccelerometerEvent`).

Hints:

- For the duration that a thrown object is in the air, it behaves as if in free fall. Check Equations for a falling body on Wikipedia for some helpful equations.
- A physical sensor will always measure noise in addition to the true data, which is why exact comparisons such as `sensor_value == 1.0` will always fail.
- To get an idea for how the data will look like, you can use the Phyphox app to record accelerometer traces.

As a bonus exercise, consider how to prevent "cheating" such as dropping the phone off a building.