# Considerations for Android Tap Detection App

## Gesture vocabulary

- Tap on back
- Doubletap on back
- Sidetap
- Pick up and drop

## Recognition

Pipeline: Accelerometer -> Smoothing -> Collector -> Envelope curve -> Quantization -> Detector

### Smoothing

Smoothing with low-pass filter

Values on Z-Axis: Values on X/Y-Axis:

### Collection

Collection of 128 samples in circular fifo queue

### Envelope curve

... (specifics about the algorithm)

### Quantization

3 categories:

- nothing: <= a
- peak: > a, <=b
- strong peak: > b, <= c
- very strong peak: > c

### Gesture detection

State machine for each gesture

- Tap
  1. nothing
  2. nothing in X/Y axis and peak (<= 15ms) in Z axis
  3. nothing
- Doubletap
  1. Tap
  2. nothing (<100ms)
  3. Tap

- Sidetap
    1. nothing
    2. peak on X and Y axis (< 50ms)
    3. nothing
- Pick up and drop
    1. nothing
    2. strong peak on Z axis (> 15ms)
    3. very strong peak on Z axis (< 10ms)
    4. nothing