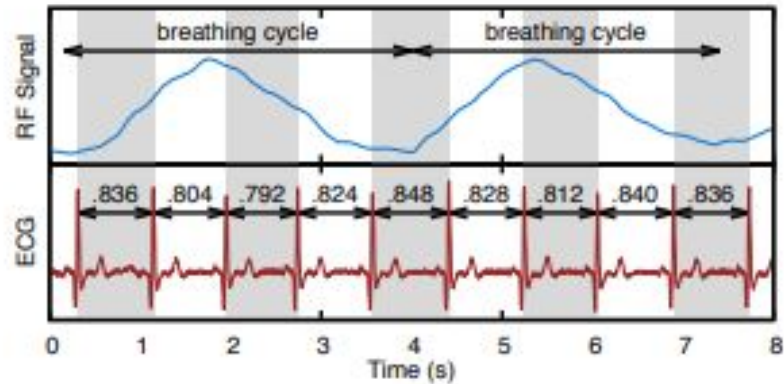# Emotion Recognition using Wireless Signals

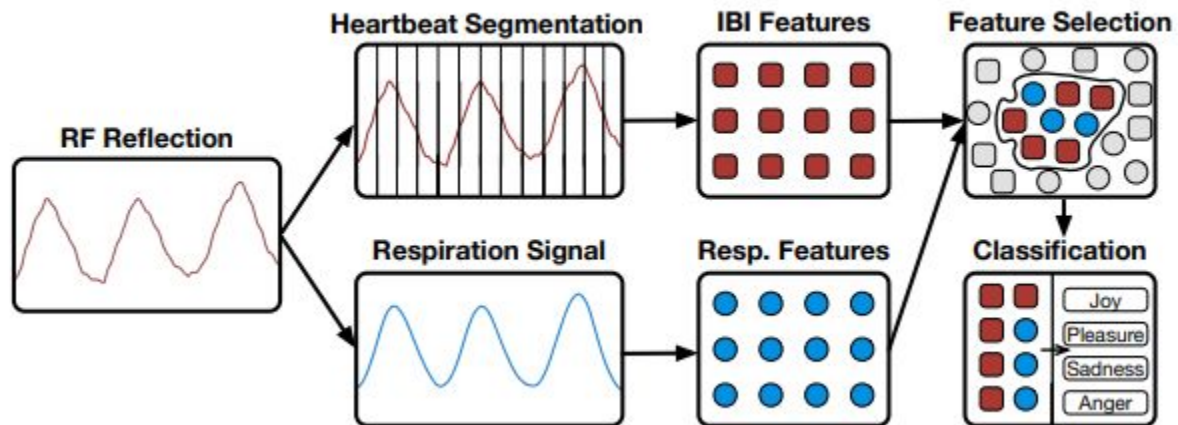Mingmin Zhao, Fadel Adib, Dina Katabi

RF vs ECG

Challenges

- Breathing overshadows heart beat.

- No clear distinction of heart beats in RF signal.

- Few millisecond resolution.

Solutions

- Use acceleration

- Optimization for segmentation and morphology

- Accurate estimates of beat intervals upto resolution of few milliseconds.
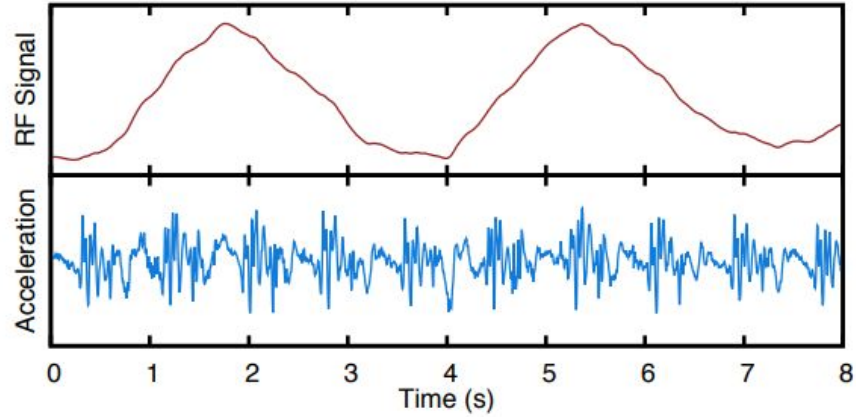
EQ-radio

Capturing the signal

- FMCW technique

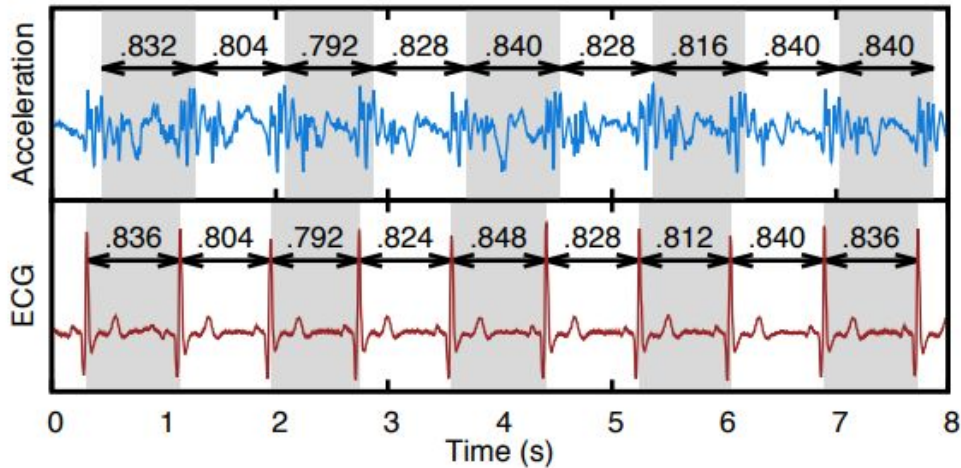- Phase measurement

$$\phi(t) = 2\pi \frac{d(t)}{\lambda},$$

- Removing static objects

IBI (inter beat intervals)

Segmentation of heart beat

- Optimize between a segmentation and a morphology
- Alternating between the two optimizations

Results