



# Atrial Fibrillation detection using a wristband device

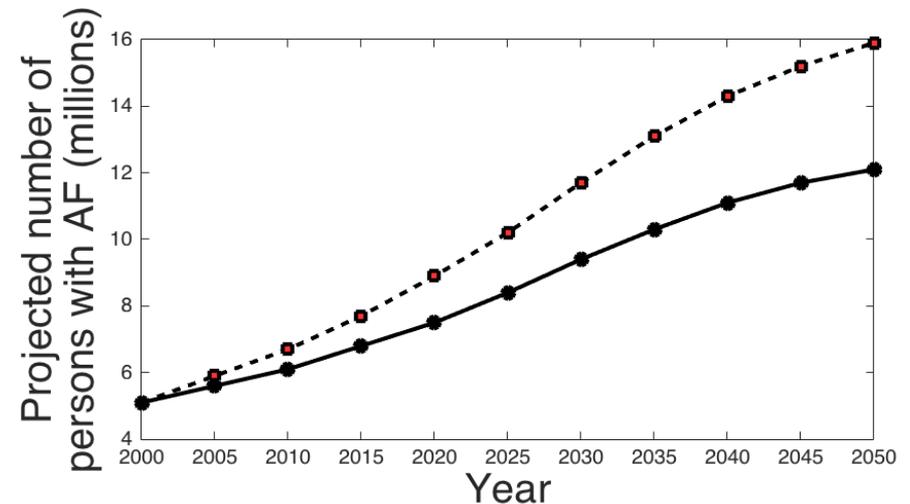
Atrial Fibrillation (AF) is the most common sustained arrhythmia.

## 33.5 million

Number of people with AF



Prevalence doubling with each advancing decade of age over 50 years, reaching almost 10% in octogenarians.



Freely adapted from Miyasaka et al, Circulation. 2006;114:119-125, originally published July 10, 2006.

**AF can be paroxysmal**, i.e., intermittent, **and asymptomatic**, thus resulting **very difficult to detect** and leading to loss of lives and high healthcare cost. New methods of screening to detect AF are necessary.





# M-Health suggestion

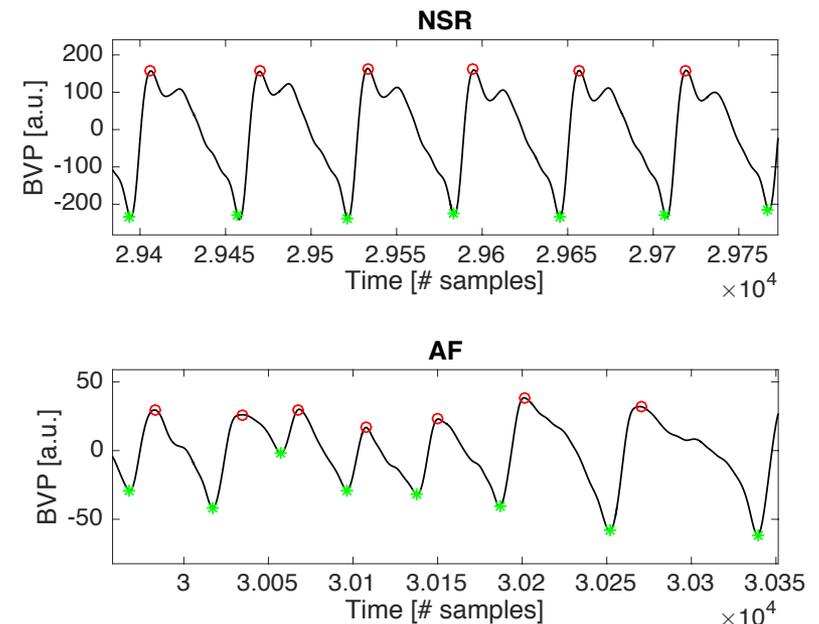
A wearable, non-invasive and potentially highly accepted wristband device is the Empatica E4.



It measures:

- BVP through Photoplethysmography (PPG) [12 bit, 64 Hz]
- 3-Axis Accelerometer Data
- Temperature
- Electrodermal Activity

The PPG signal of patients with AF (bottom) can be differentiated from healthy subjects (top), because of the different morphological and rhythmic features of the PPG signal.





Protocol - Recordings of PPG signals using Empatica E4:

- ✓ In patients in AF and in sinus rhythm to train a classifier (Data 1)
- ✓ At the family physician to screen all the people over 60 during routine visits (Data 2)

Methods:

- ✓ Removal of noisy signal's segments through threshold's application on accelerometer data
- ✓ Computation of parameters assessing variability and irregularity of the inter-diastolic interval series
- ✓ Computation of morphological parameters assessing PPG signal's waves
- ✓ Features selection, training and classification (Data 1)
- ✓ Identification of new patients with AF (Data 2)

