

# The Cross-platform Application for Arrhythmia Detection

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This project is supported by grant KA179 of Karelia ENPI - joint program of the European Union, Russian Federation and the Republic of Finland



12<sup>th</sup> FRUCT conference  
November 5-9, 2012 Oulu, Finland

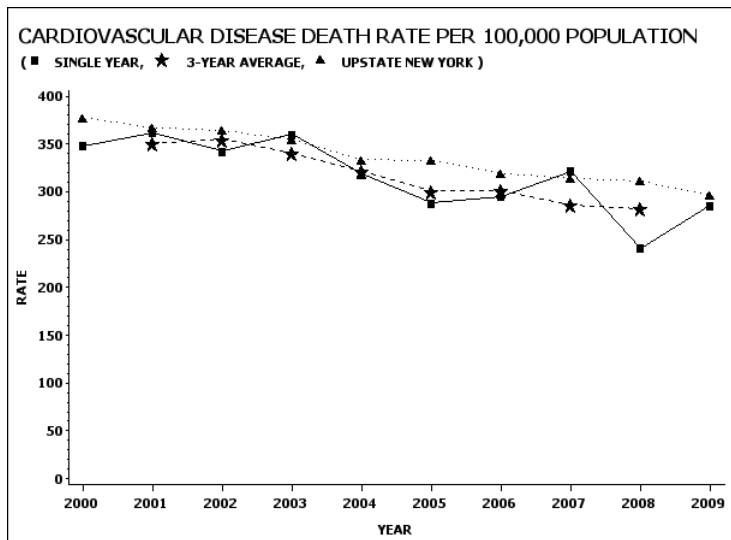


# Agenda

- Cardiovascular diseases
- Heart function monitoring devices
- Obtaining and visualising ECG recordings
- Arrhythmia detection
- Conclusion



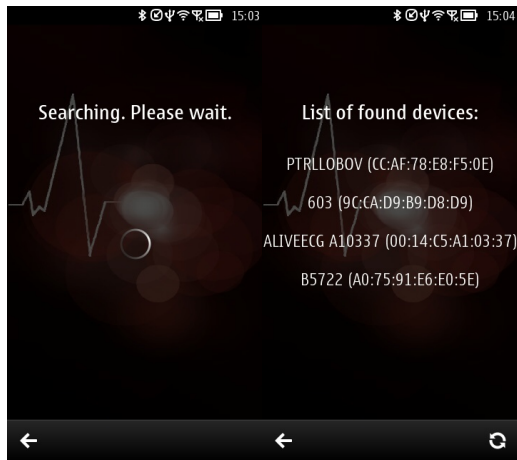
# Cardiovascular Diseases



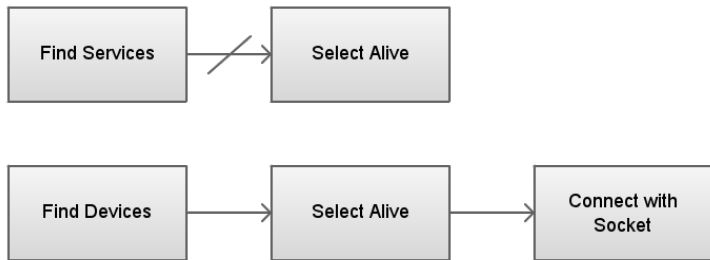
# Cardiac Monitors



# Discovering Bluetooth-avalible Devices



# Particularity of Alive Bluetooth Connection



[online diagramming & design] [creately.com](https://creately.com)

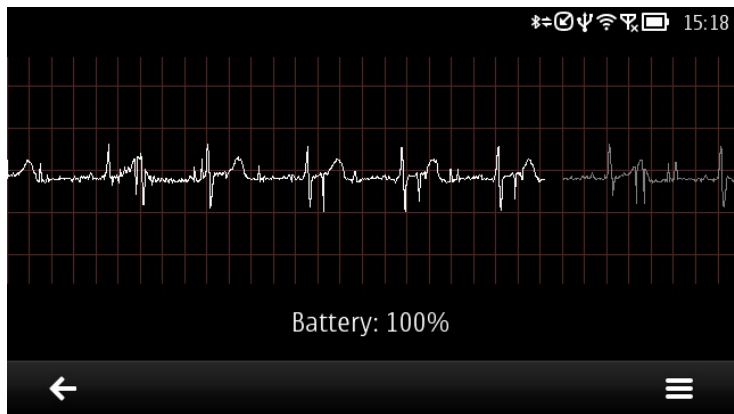


# ECG data stream format

- Channels Single channel
- Recording Resolution: 8 bit
- Recording Sampling Rate: 300 samples/sec
- Dynamic Range: 5.3mV Peak to Peak
- Bandwidth 0.5Hz – 90Hz



# Active mode





# Arrhythmias to be detected

## Atrial:

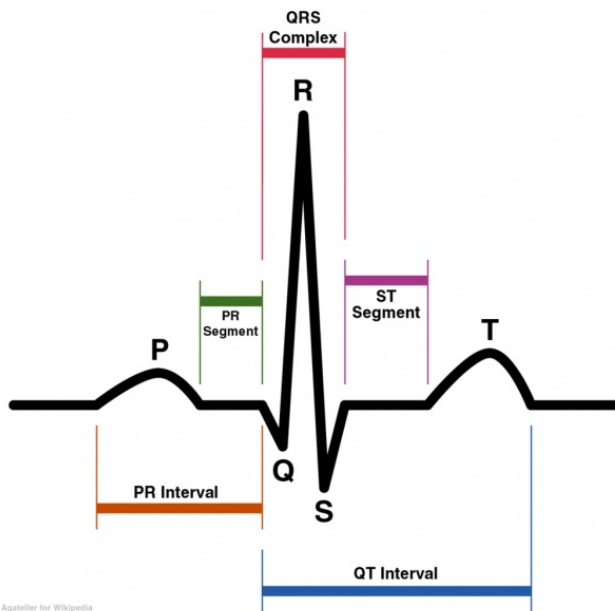
- Sinus Tachycardia
- Sinus Bradycardia
- Sinus Arrhythmia
- Extrasystole

## Ventricular:

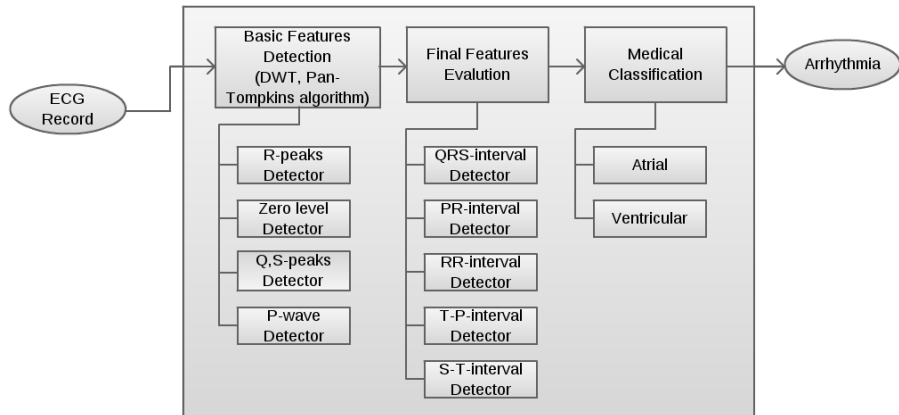
- First-Degree Heart Block
- Second-Degree Heart Block
- Third-Degree Heart Block
- Ventricular Tachycardia
- Ventricular Fibrillation
- Ventricular Flutter
- Extrasystole



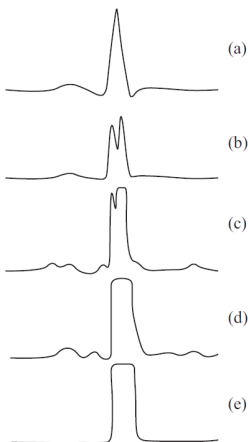
# ECG structure



# Arrhythmia classification



# Pan-Tompkins Algorithm



- Original ECG
- Smoothed and rectified first derivative.
- Smoothed and rectified second derivative.
- Smoothed sum of (b) and (c).
- Square pulse output for each QRS complex.



# User data

NOKIA

13:03

*User data*

Login

Height

Weight

Age

Phone number for  
emergency communications

Save Cancel

←



# Emergency SMS



[cs.karelia.ru](http://cs.karelia.ru)

# State of the project

Project page:

<http://redmine.cs.karelia.ru/projects/mad>

Source code:

<ssh://kappa.cs.karelia.ru/groups/repos/git/mad>

Nokia Store page:

<http://store.ovi.com/content/323185>



# Thanks for your attention!

