ApnoeDetect

"Simple software for automatic sleep apnea and oxygen desaturation detection based on neural networks for EASYS2 .d files"

Authors:

- Martin Bartoň
- Vlastimil Koudelka

Description

This experimental program can detect decrees in airflow and decrees in oxygen the main features of sleep apnea. The main advantage is that, detection algorithm is made by convolution neural network and this network was learned from previously scored data by the doctors from NUDZ. The program is working with ".d" files from EASYS2 Brainscope. The tags are saved into new copied file.

Technical requirements

- Python 3.6 with libraries:
    - Keras 2.3.1
    - Tensorflow 2.0.0
    - AppJar 0.94.0
    - Numpy 1.18.0
    - Scipy 1.4.1
    - Struct
    - Window_slider 0.8
    - Collections
    - Pytictoc
    - Shutil
    - (all available from pip: https://pypi.org/)
- Input data – ".d" file with flow and SpO_2 signal.

If you are new to python environment follow:
https://wiki.python.org/moin/BeginnersGuide

On windows a recommend using python portable:
http://winpython.github.io/

or Anaconda:
https://www.anaconda.com/
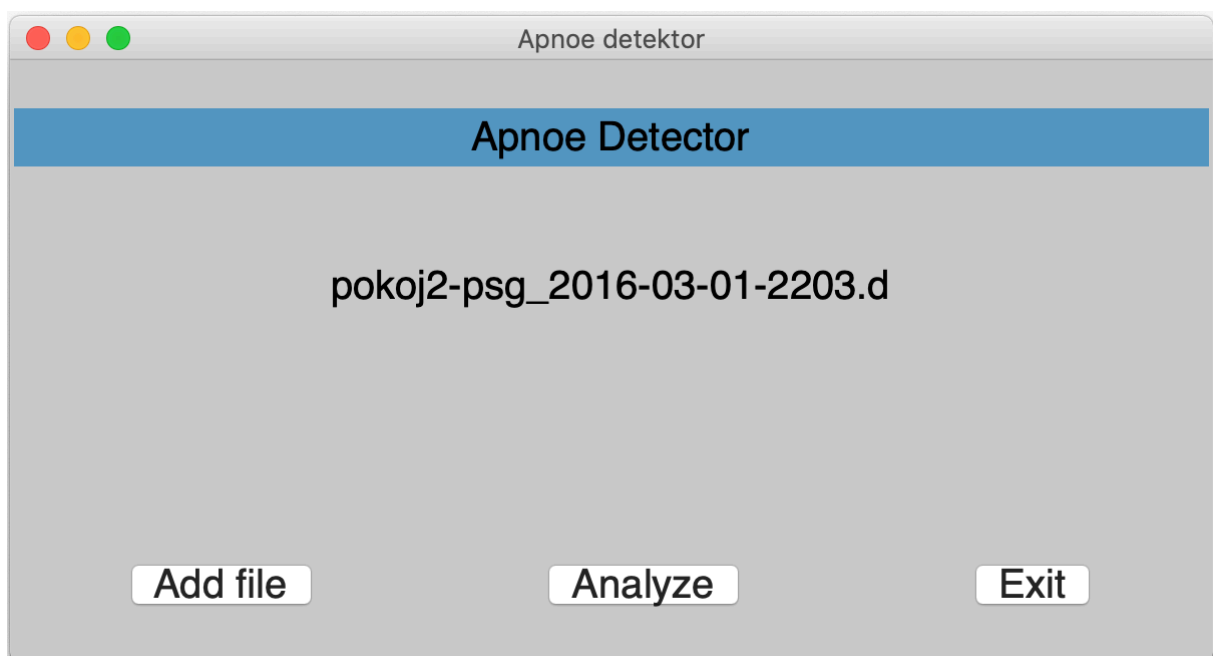
In case of error or any questions please contact me on ma.barton@seznam.cz
This detector is not final product. We are still working on improvements.

How to use ApnoeDetect

1) Launch file *AD_GUI.py* with installed python3.
2) The application will pop up window.
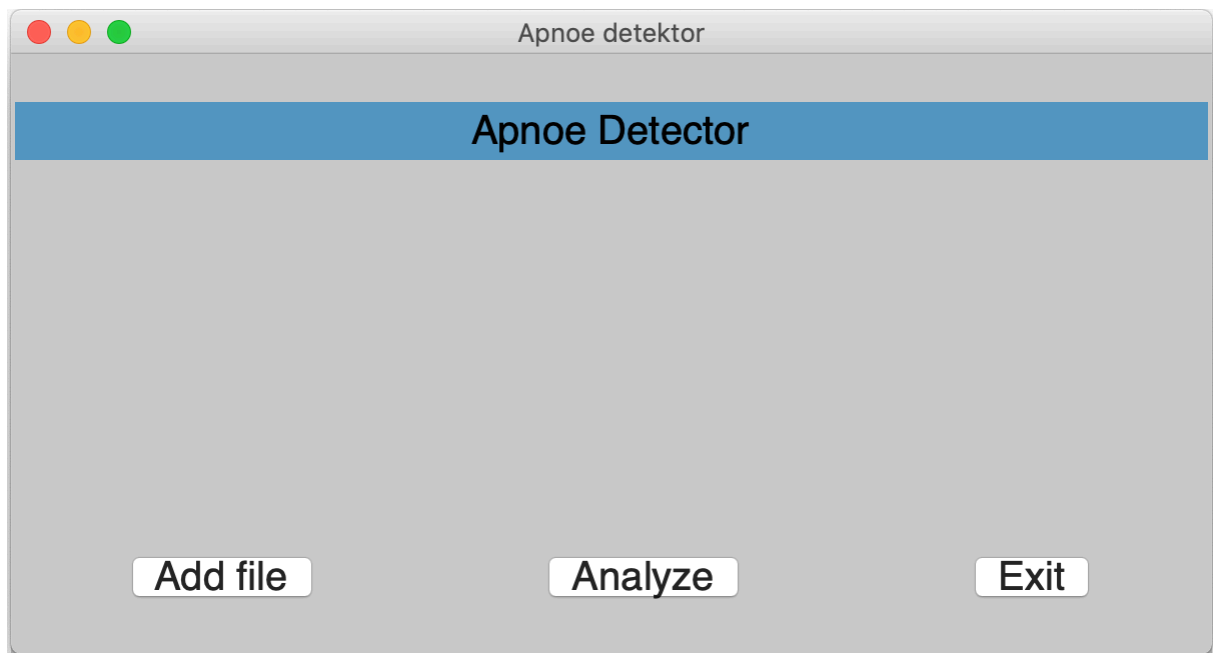
3) Click on "*Add file*". The classic dialog window for file selection will show up. Select your file with suffix ".d".

4) Name of your file will show up in the window. Check if it is correct.

5) Click on *"Analyze"* . After that the copy of the original file will be created in the same location with suffix *"_AUTO".* Than process of detection will start. There is no loading bar available, but you can track progress in console. The detection process may be long (few minutes based on computation power).
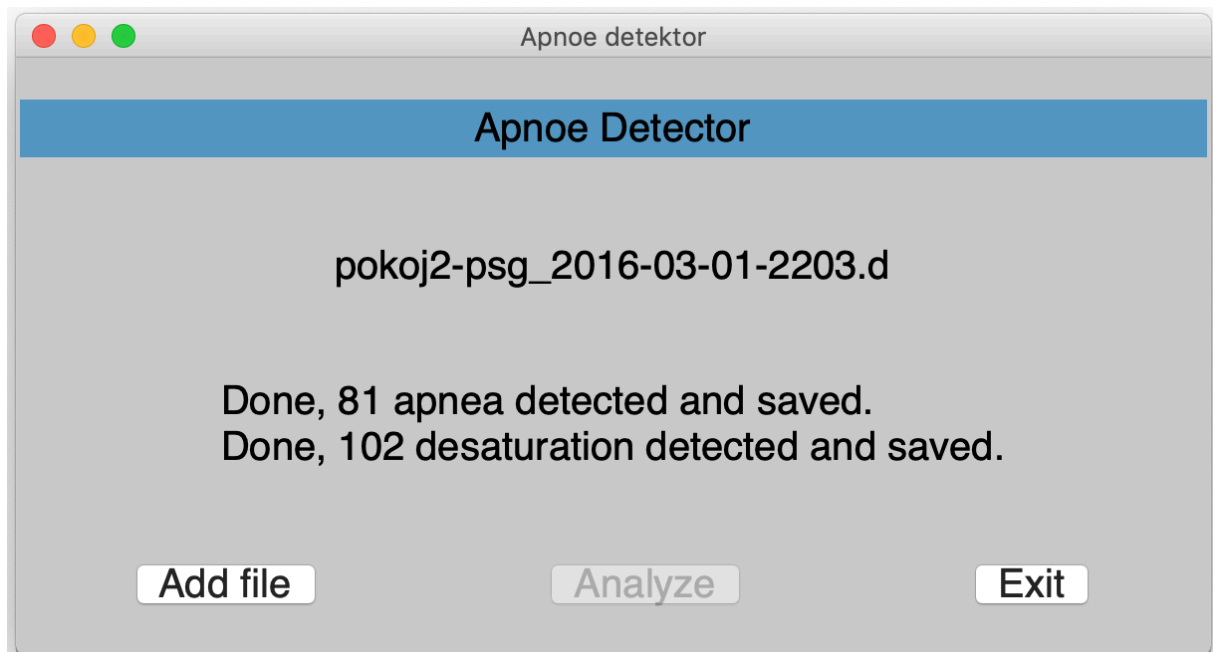
6) After detection is done, the tags will be saved into copied file. On screen you will see results. Than you can close the window.
7) Example viewed in EEGviewer.