Technical Challenge

Algorithm Development, ResMed Sensor Technologies

This technical challenge has been designed to test your algorithm development abilities. You have been provided with a sample of data (signals.csv) acquired by a contactless radio frequency sensor from one of ResMed Sensor Technologies' commercial products. This sensor records bio-motion signals of a user during sleep and contains information about the subjects breathing and movement over time.

The goal of the challenge is to code an algorithm that analyses the provided data and produces an output signal that is an estimate of the users' respiration rate throughout the recording.

The respiration rate output should be represented with units of breaths per minute and provided once every 30 seconds. Please note the provided file 'signals.csv' contains two separate channels of bio-motion data, both sampled at 16 Hz, you may use either or both of these signals for your respiration rate algorithm.

We have not provided a respiration rate reference for comparison so use your best judgement of what approach and design choices to take.

Please prepare a brief presentation (3 slides maximum) which may include:

- A description of the chosen design
- Pros or cons of the design; alternate approaches that could be taken
- Sample results – respiration trace or other analyses
- Challenges encountered and solution(s) identified

Please also provide any code available to support your work. You may use any programming language of your choice.

Good luck!