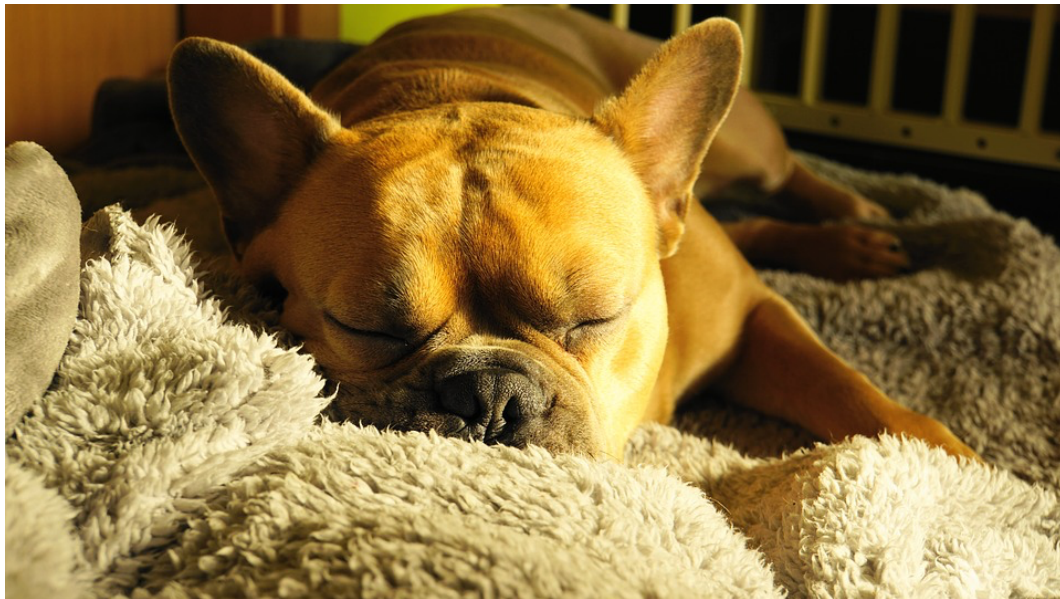


Case study

Snore detection

Exercise

The problem



- Obstructive sleep apnea (OSA) is one of the most common sleep disorders, and is characterized by frequent partial or complete collapse of the upper airway during sleep
- One of the earliest and most common symptoms of OSA is snoring, which occurs in 70% to 95% of the OSA patients
- Polysomnography is the gold standard for diagnosing OSA, which requires overnight recordings of patients with multiple sensors in a sleep lab
- But this method is costly, the waiting list is long, and it can be not comfortable due to multiple sensors attached to body

Source: <https://pixabay.com/photos/french-bulldog-dog-sleeping-pet-3996971/>

Exercise

The data

- Your team set out to use audio to perform diagnosis for OSA. However, before the diagnosis, you need an algorithm to identify the snoring events in the audios.
- 40 subjects' sleeping were recorded, each audio recording is more than an hour long. The sampling frequency was set to 48kHz, and the sampling resolution was 24 bits.
- Among the 40 subjects, 32 of them had OSA and the rest had none. The male to female ratio is 3 to 1, and the mean age is 55.



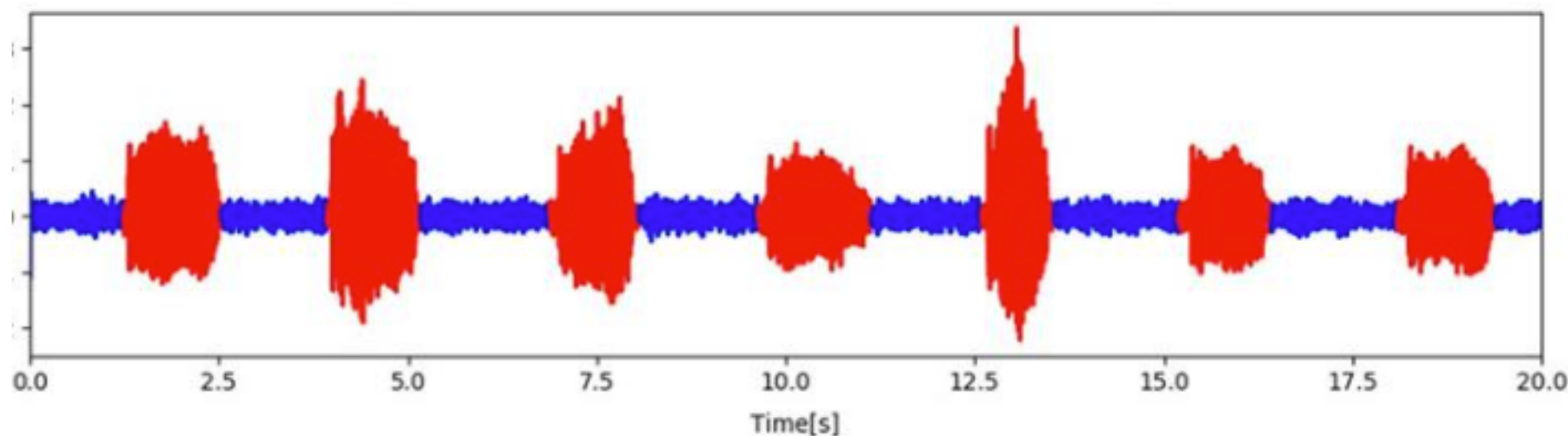
Source: https://www.flickr.com/photos/nick_wilkes/828689231/

Exercise

The question

- Given the data and the problem, how would you build the algorithm to detect snoring in audio? Specify the steps you would take to prepare your dataset, the method you choose, the input and the output of your mode
- Produce your answer in a powerpoint document and submit to luminus
- Each team shall have 15 minutes to present their solution

A recording of 20s with 7 snoring events. The waveforms colored in red are snoring events.



Workshop

- In previous example, we use a 1D array of the audio as input
- Not a good representation. Use either spectrogram or MFCC as input and train a simple yet better deep learning model.
- Rename your jupyter notebook with your name