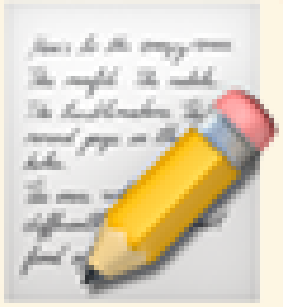
06/28 BRIEFING



DATASET VISUALIZATION

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THE PROBLEM WE SOLVED

- Visualization the source dataset

THE TRAINING DATA

- tr03-1010/
  - tr03-1010-arousal.mat
  - tr03-1010.arousal
  - tr03-1010.hea
  - tr03-1010.mat

VISUALIZATION ECG

Load data

```
1 import wfdb
2 import os
3 import matplotlib.pyplot as plt
4
5 record_name = 'tr03-1010'
6 record_path = os.path.join(train_path, record_name, record_na
7 record = wfdb.rdrecord(record_path)
```

VISUALIZATION ECG

```
ecg_data = record.p_signal[:, -1]

import numpy as np
import matplotlib.pyplot as plt

sampling_rate = 200
time = np.arange(len(ecg_data)) / sampling_rate

plt.figure(figsize=(10, 4))
plt.plot(time, ecg_data)
plt.title('ECG')
plt.xlabel('Time (s)')
plt.ylabel('Amplitude')
plt.grid(True)
plt.show()
```

VISUALIZATION ECG

VISUALIZATION SLEEP STAGES

Load data

```
import wfdb
import os
import matplotlib.pyplot as plt

record_name = 'tr03-1010'
record_path = os.path.join(train_path, record_name, record_name)
arousal = wfdb.rdann(record_path, 'arousal')
```

VISUALIZATION SLEEP STAGES

Observe data

```
set(arousal.__dict__.get('aux_note'))
```

```
{'(arousal_rera',
 '(resp_centralapnea',
 '(resp_hypopnea',
 '(resp_mixedapnea',
 '(resp_obstructiveapnea',
 'N1',
 'N2',
 'N3',
 'R',
 'W',
 'arousal_rera)',
 'resp_centralapnea)',
 'resp_hypopnea)',
 'resp_mixedapnea)',
 'resp_obstructiveapnea)'}
```

VISUALIZATION SLEEP STAGES

```
import mat73
import scipy.io

record_name = 'tr03-1010'

record_path = os.path.join(train_path, record_name, f'{record_na
aasmlabel = mat73.loadmat(record_path)
```

VISUALIZATION SLEEP STAGES

```
 1 import matplotlib.pyplot as plt
 2 import numpy as np
 3
 4 # Define the sleep stages of interest
 5 sleep_stages = ['wake', 'nonrem1', 'nonrem2', 'nonrem3', 're
 6
 7 # Get the sleep stage labels
 8 stage_labels = aasmlabel['data']['sleep_stages']
 9
10 # Create a list to store the sleep stage values
11 stage_values = []
12
13 # Iterate over the sleep stages of interest and extract thei
14 for stage in sleep_stages:
15     stage_values.append(stage_labels[stage])
```

VISUALIZATION SLEEP STAGES

WHAT I HAVE LEARNED YESTERDAY?

- use `wfdb` to load data
- use `.mat` type data

WHAT I WANT TO SOLVE TODAY?

- ECG -> Heart Rate and BBI
- BBI -> Heart Rate
- Heart Rate, HRV v.s. Sleep Stage (Correlation?)

REFERENCE

- awerdich/physionet
- Heart Murmur Detection from Phonocardiogram Recordings: The George B. Moody PhysioNet Challenge 2022
- physionet-visualization