Exploring data examples

Most of the ECG behave relatively “normal” from a non-medical point of view, but rather from an empirical one by looking at several examples.

From the perspective of training a model, this is good since we can “normalize” them in ranges say from -1 to 1, which would allow the model to more easily find the optimal functions to label the data.

Nonetheless, there are some registers that we believe still need to be revised before using them as they are.

Some examples of this are:

1) Registers with very high or low limits

2) Registers for which the diagnosis might not be present in the first 3 seconds

3) Registers that show strange patterns

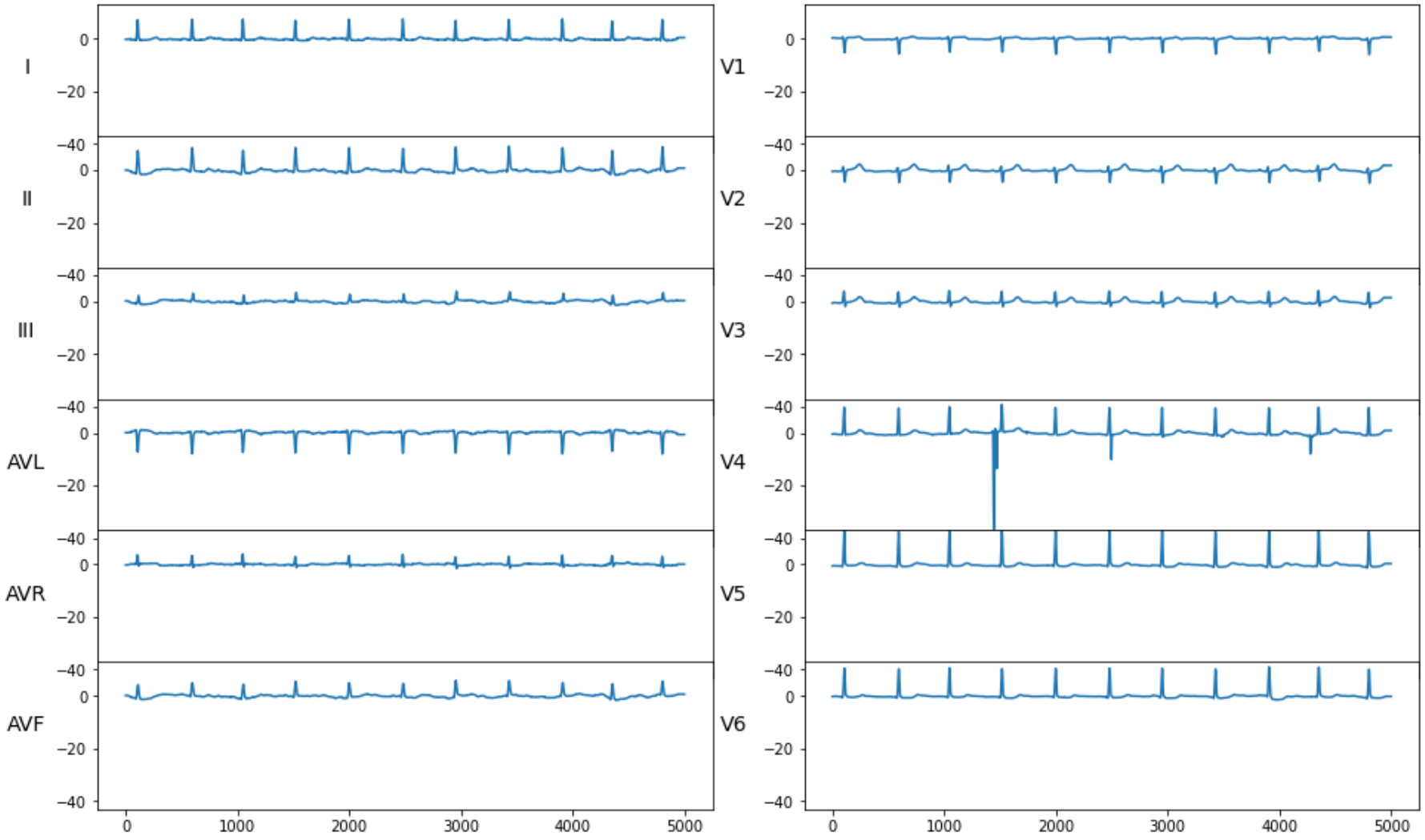
Example 1.1

- V4
  - Heavily drops

The min value of this ECG is -43.21 and the max value is 13.005

Dimensions: (5000, 12)
Duration (seconds): 10.0
Age: 68
Sex: Female

Dx: ['myocardial ischemia', 'left ventricular hypertrophy', 'sinus rhythm']



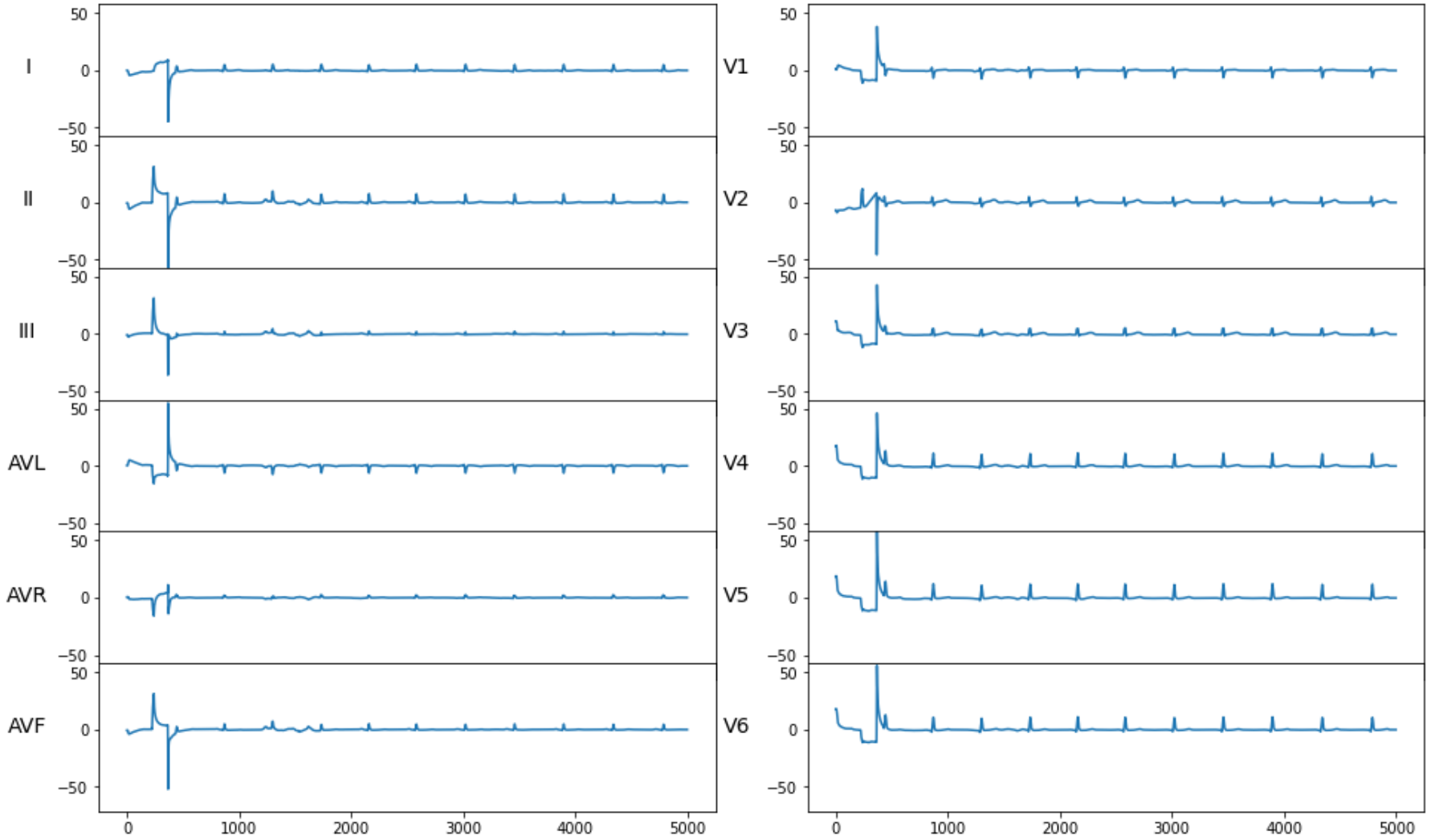
Example 1.2

- All
  - The lowest and highest bounds are too steep.

The min value of this ECG is -71.325 and the max value is 58.0

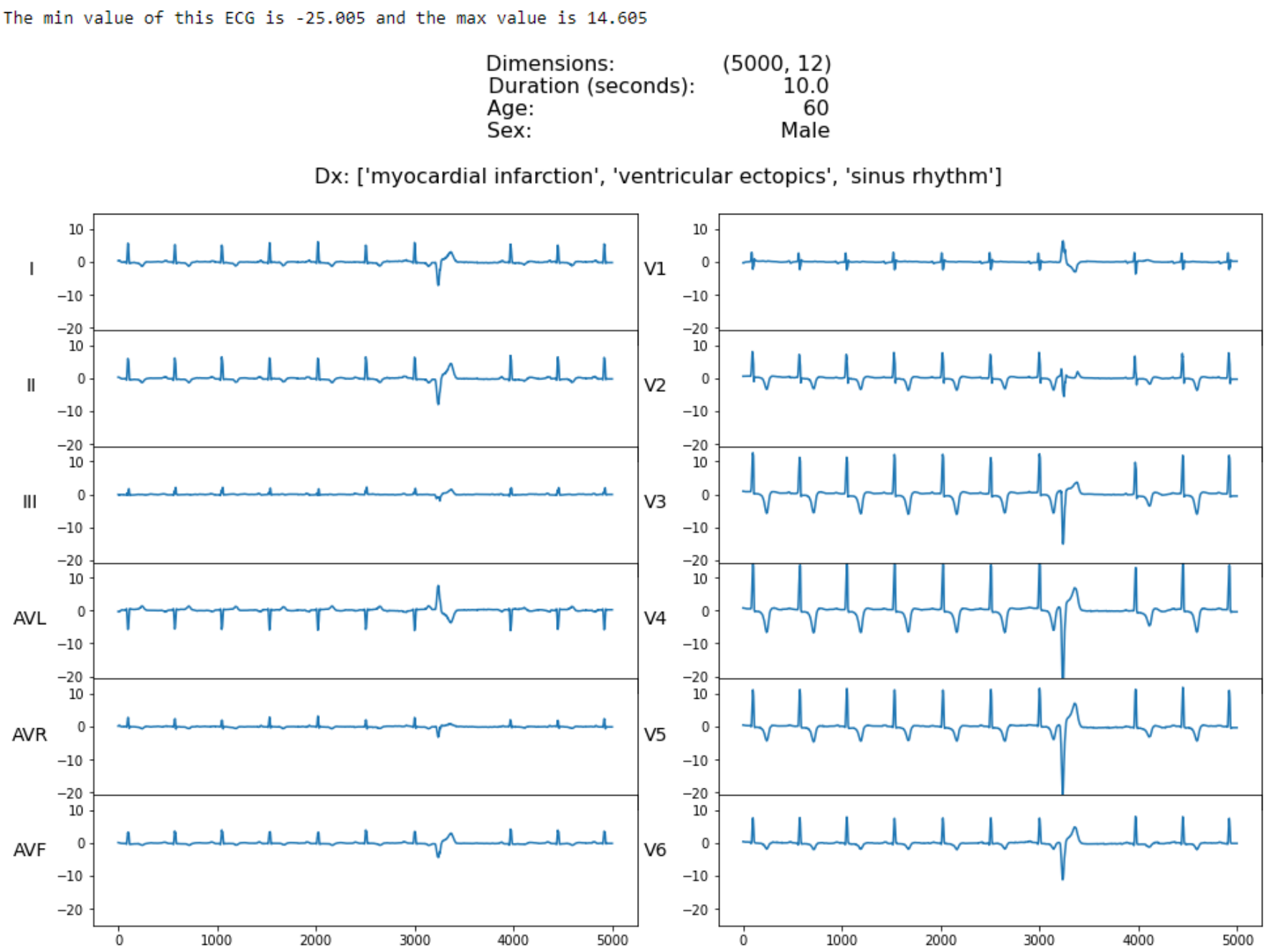
Dimensions:	(5000, 12)
Duration (seconds):	10.0
Age:	55
Sex:	Male

Dx: ['left ventricular hypertrophy', 'abnormal QRS', 'sinus arrhythmia']



Example 2.1

- All
  - Did myocardial infarction happen in the first 3 seconds? (Where 0 is the 0 second and 5000 is the 10th second)



Example 3.1

- V2, V3 & V3
  - Strange patterns

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The min value of this ECG is -28.29 and the max value is 19.73
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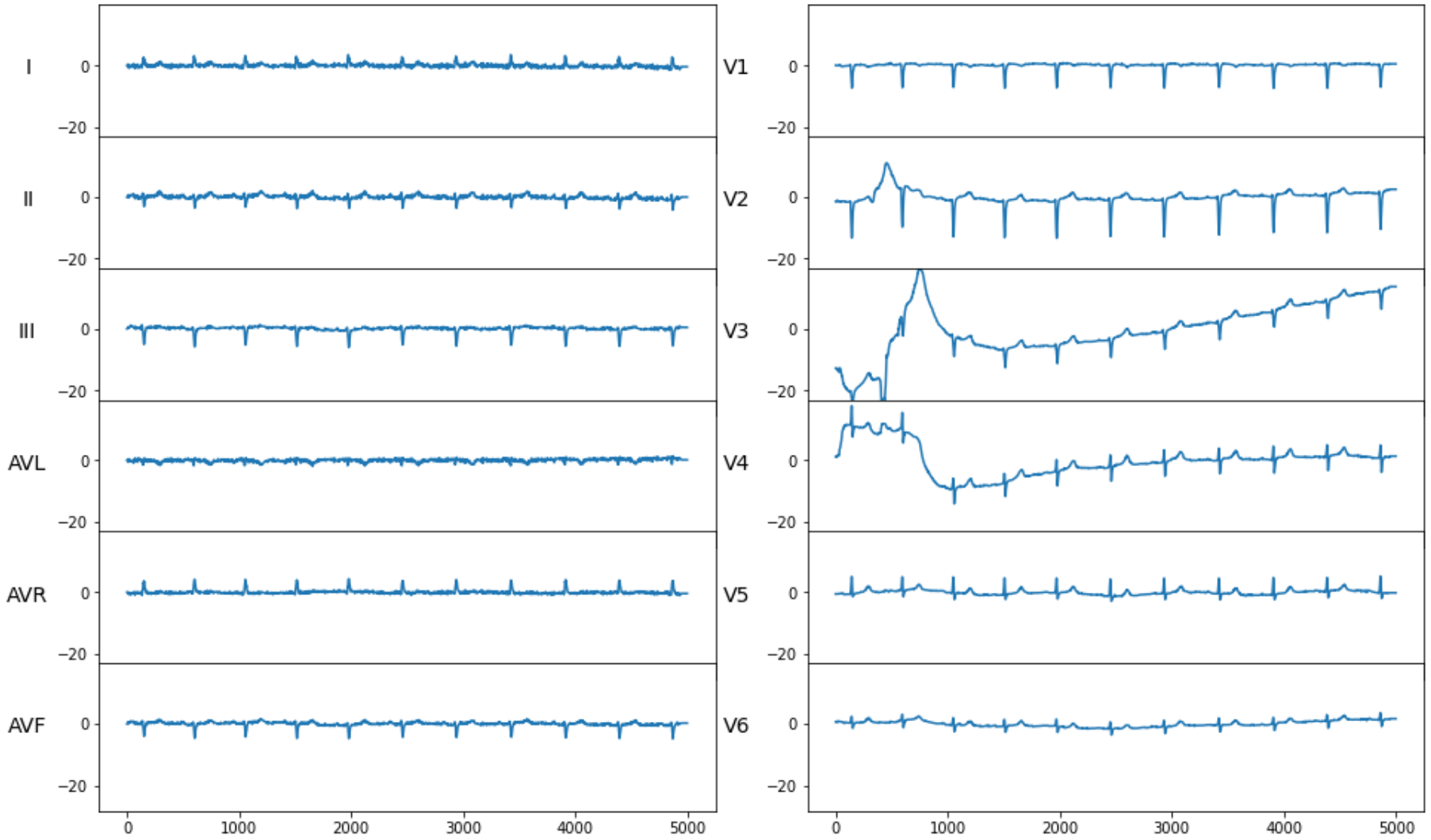
Dimensions: (5000, 12)
Duration (seconds): 10.0
Age: 75
Sex: Female

Dx: ['myocardial infarction', 'left axis deviation', 'sinus rhythm', 'left anterior fascicular block']



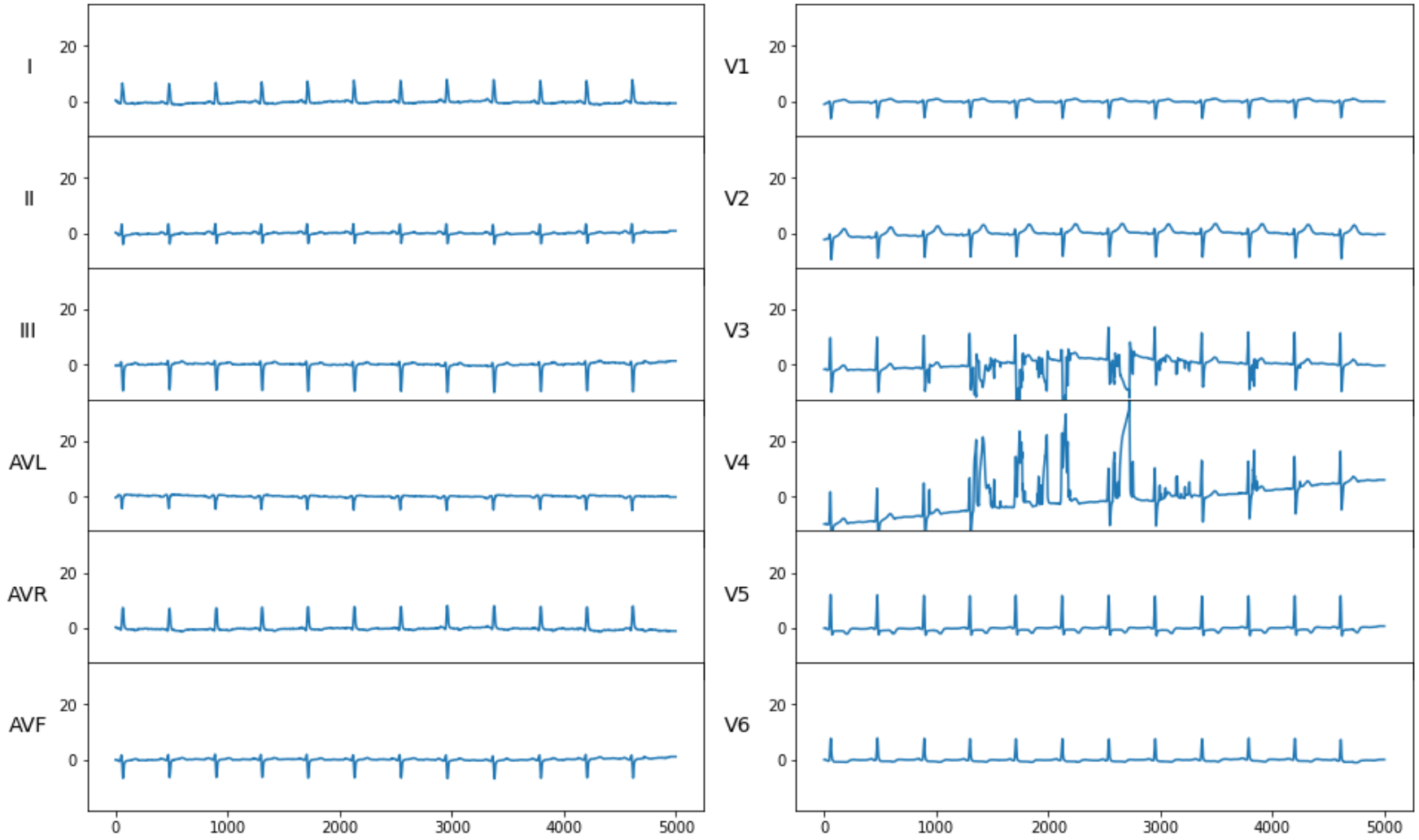
Example 3.2

- V3 & V4
  - Strange patterns

The min value of this ECG is -18.14 and the max value is 35.055

Dimensions: (5000, 12)
Duration (seconds): 10.0
Age: 76
Sex: Female

Dx: ['myocardial ischemia', 'left ventricular hypertrophy', 'left axis deviation', 'sinus rhythm', 'st depression']

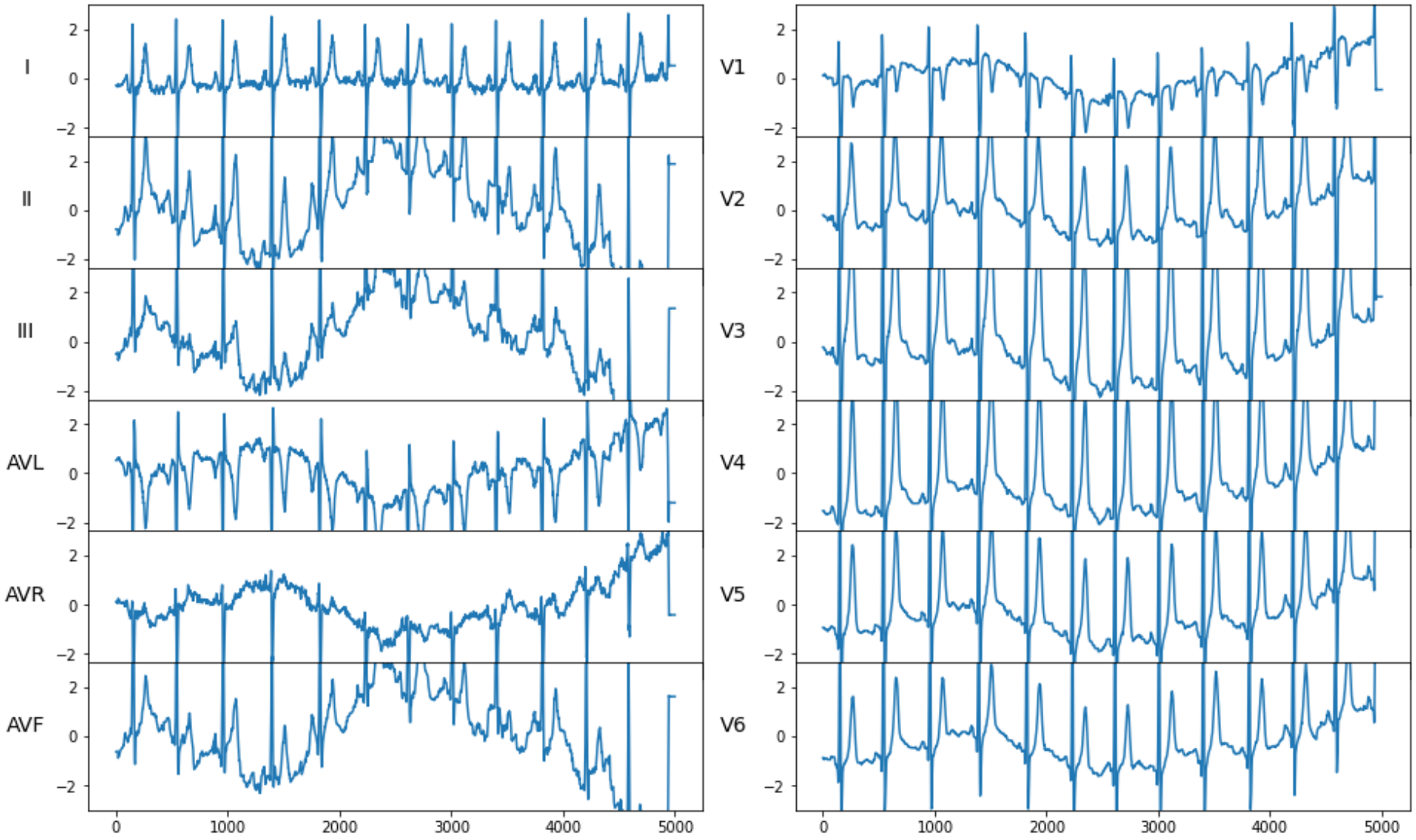


Example 3.4

- V3 & V4
  - Strange patterns

Dimensions: (5000, 12)
Duration (seconds): 10.0
Age: 24
Sex: Male

Dx: ['sinus rhythm']



Questions

Which are outliers?

Can we do log or some transformations? Does the dx change?

Can we in some way remove or diminish the patterns to make all the signals look more similar?