Track patient recovery in real-time by processing streaming data

BIOMEDICAL DATA DESIGN

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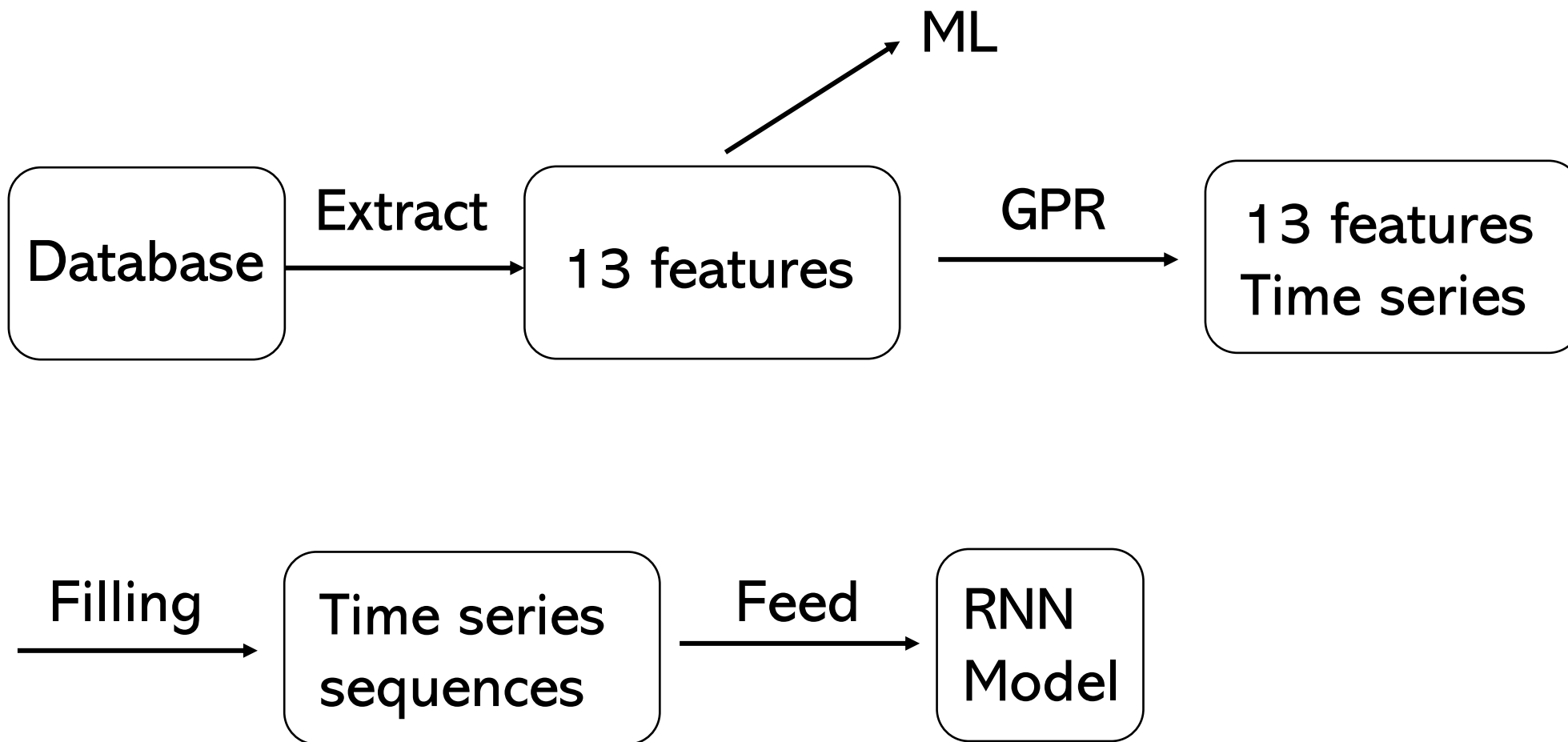Haobin Zhou
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01
Process from database to model

Pipeline

Process from database to model

diagnosis.csv

patient.csv

Check_nonempty_patients.ipynb

Final_available_patients.csv (patients' id)

apachePatientResult.csv
patient.csv

Patient Results.ipynb

mortality_data.csv

Process from database to model

vitalPeriodic.csv

nurseCharting.csv

vitalAperiodic.csv

intakeOutput.csv

lab.csv

respiratoryCharting.csv

+ Final_available_patients.csv

Urine_align.ipynb
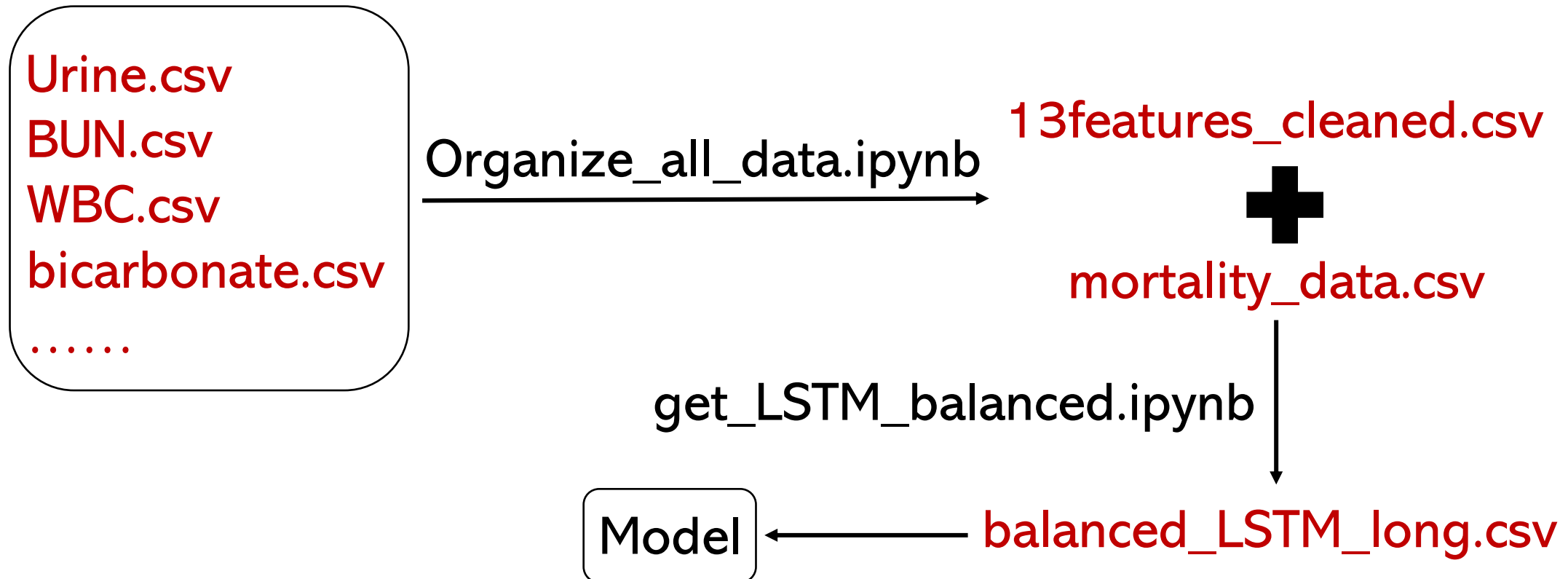
…

lab1: BUN

lab2: WBC

lab3: bicarbonate

lab4: sodium

lab5: potassium

lab6: bilirubin

Urine.csv, BUN.csv, WBC.csv, bicarbonate.csv……

01 Process from database to model

02

Next Step

For the presentation of our work

1. Poster!!!!

2. Update in the RNN and traditional LSTM model: presentation of the results

3. Some few bugs or problems

Thank you

Change the parameters

Learning rate

lr=0.0005,epoch=20 avg_acc=88.39%

Hidden size

```
Epoch 10/20, Train Loss: 0.3464, Test Accuracy: 89.49%
Epoch 11/20, Train Loss: 0.3421
Epoch 12/20, Train Loss: 0.3299
Epoch 13/20, Train Loss: 0.3394
Epoch 14/20, Train Loss: 0.3330
Epoch 15/20, Train Loss: 0.3368, Test Accuracy: 87.87%
Epoch 16/20, Train Loss: 0.3310
Epoch 17/20, Train Loss: 0.3244
Epoch 18/20, Train Loss: 0.3292
Epoch 19/20, Train Loss: 0.3169
Epoch 20/20, Train Loss: 0.3265, Test Accuracy: 88.68%
Accuracy: 0.886792452830188 7
Precision: 0.8502994011976048
Recall: 0.8930817610062893
F1 Score: 0.871656441717791
Confusion Matrix:
[[187  25]
 [ 17 142]]
```

```
Epoch 10/20, Train Loss: 0.3234, Test Accuracy: 85.64%
Epoch 11/20, Train Loss: 0.3199
Epoch 12/20, Train Loss: 0.3125
Epoch 13/20, Train Loss: 0.3022
Epoch 14/20, Train Loss: 0.3040
Epoch 15/20, Train Loss: 0.2979, Test Accuracy: 89.10%
Epoch 16/20, Train Loss: 0.3262
Epoch 17/20, Train Loss: 0.3077
Epoch 18/20, Train Loss: 0.3097
Epoch 19/20, Train Loss: 0.3083
Epoch 20/20, Train Loss: 0.2981, Test Accuracy: 89.36%
Accuracy: 0.8936170212765957
Precision: 0.8728323699421965
Recall: 0.893491124260355
F1 Score: 0.883040935672 5145
Confusion Matrix:
[[185  22]
 [ 18 151]]
```
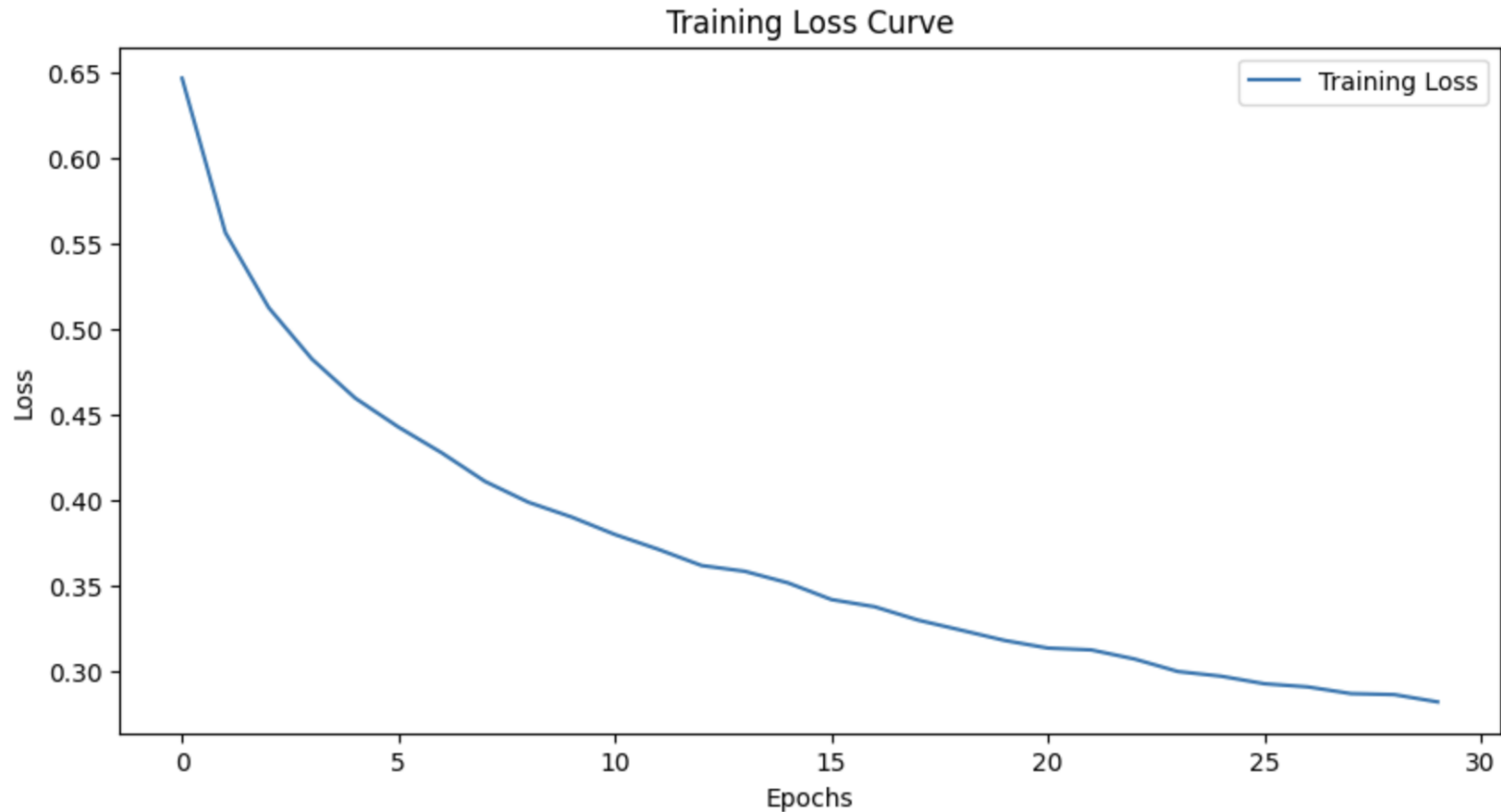
```
Epoch 10/20, Train Loss: 0.3389, Test Accuracy: 87.50%
Epoch 11/20, Train Loss: 0.3365
Epoch 12/20, Train Loss: 0.3346
Epoch 13/20, Train Loss: 0.3245
Epoch 14/20, Train Loss: 0.3310
Epoch 15/20, Train Loss: 0.3226, Test Accuracy: 88.03%
Epoch 16/20, Train Loss: 0.3186
Epoch 17/20, Train Loss: 0.3178
Epoch 18/20, Train Loss: 0.3161
Epoch 19/20, Train Loss: 0.3121
Epoch 20/20, Train Loss: 0.3079, Test Accuracy: 89.36%
Accuracy: 0.8936170212765957
Precision: 0.88125
Recall: 0.8703703703703
F1 Score: 0.8757763975155279
Confusion Matrix:
[[195  19]
 [ 21 141]]
```

Change the parameters
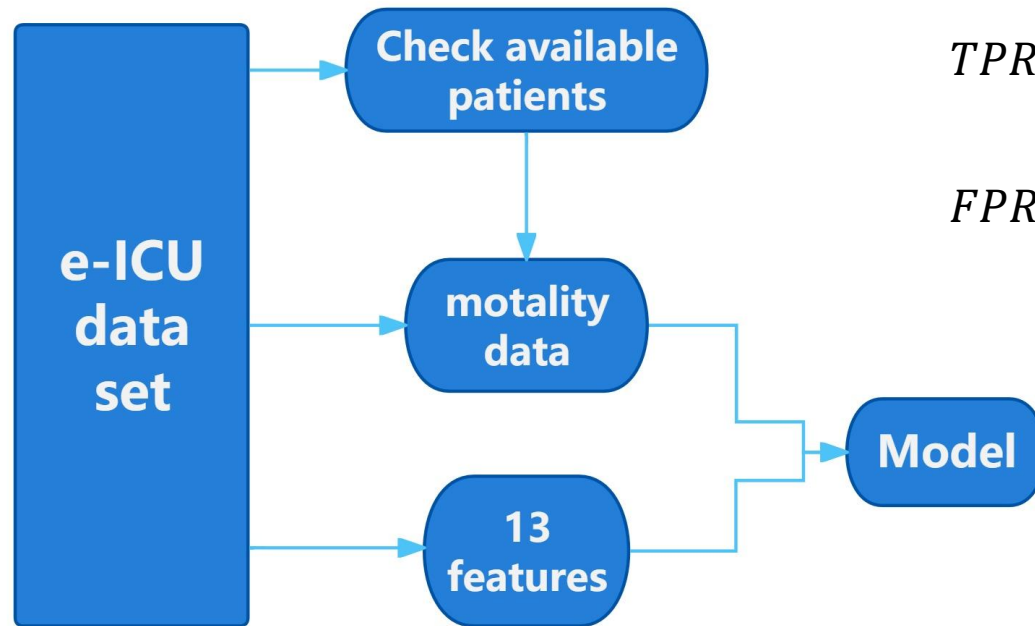
Learning rate   lr=0.0001,epoch=30

Hidden size

Training Loss Curve

Change the parameters

Learning rate

Hidden size: Trying

$$TPR = \frac{TP}{TP + FN}$$

$$TPR = \frac{TP}{TP + FN} \quad FPR = \frac{FP}{FP + TN}$$

$$FPR = \frac{FP}{FP + TN}$$