**Model: Time Series Baseline**

**Layer: LSTM**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .87 | .54 | .91 | .44 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .48 | .93 | .37 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .63 | .65 | .56 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .20 | .92 | .03 |

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**Model: Time Series Baseline**

**Layer: GRU**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .57 | .92 | .44 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .51 | .94 | .40 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .63 | .66 | .54 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .20 | .92 | .04 |

------------------------------------------------------------------------------------------------------------------------------

**Model: Multimodal Baseline**

**Layer: GRU**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .59 | .92 | .49 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .54 | .94 | .44 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .71 | .64 | .66 | .56 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .22 | .92 | .06 |

**Model: Multimodal Baseline**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .48 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .53 | .94 | .45 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .23 | .92 | .06 |

**Model: Multimodal Baseline**

**Layer: GRU**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .45 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .53 | .94 | .45 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .57 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .23 | .92 | .06 |

------------------------------------------------------------------------------------------------------------------------------

**Model: Proposed CNN**

**Layer: GRU**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .47 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .45 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .53 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .22 | .92 | .03 |

**Model: Proposed CNN**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .48 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .41 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .22 | .92 | .02 |

**Model: Proposed CNN**

**Layer: GRU**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .91 | .46 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .43 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .56 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .22 | .92 | .02 |

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**Ablations/Experiments**

**Ablation: Use LSTM in Proposed rather than GRU**

**Model: CNN**

**Layer: LSTM**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .91 | .46 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .52 | .94 | .42 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .64 | .66 | .54 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .72 | .21 | .92 | .02 |

**Model: CNN**

**Layer: LSTM**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .56 | .91 | .45 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .43 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .63 | .66 | .51 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .21 | .92 | .01 |

**Model: CNN**

**Layer: LSTM**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .56 | .92 | .43 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .50 | .94 | .42 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .67 | .58 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .72 | .21 | .92 | .006 |

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**Ablation: Remove Final Conv1D Layer from proposed**

**Model: CNN**

**Layer: GRU**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .45 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .86 | .52 | .94 | .44 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .63 | .66 | .53 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .22 | .92 | .07 |

**Model: CNN**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .56 | .91 | .46 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .52 | .94 | .43 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .63 | .66 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .71 | .22 | .92 | .01 |

**Model: CNN**

**Layer: GRU**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .57 | .91 | .47 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .51 | .94 | .43 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .63 | .67 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .21 | .92 | .01 |

------------------------------------------------------------------------------------------------------------------------------

**Ablation: Remove Final Two Conv1D Layers from proposed**

**Model: CNN**

**Layer: GRU**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .57 | .92 | .43 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .45 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .54 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .22 | .92 | .02 |

**Model: CNN**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .57 | .92 | .46 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .48 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .63 | .66 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .72 | .21 | .92 | .08 |

**Model: CNN**

**Layer: GRU**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .57 | .91 | .45 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .52 | .94 | .44 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .69 | .62 | .66 | .55 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .20 | .92 | .04 |

**Ablation: Change filter size on proposed model from 32 to 64**

**Model: CNN**

**Layer: GRU**

**Embedding: word2vec**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .44 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .52 | .94 | .43 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .67 | .56 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .75 | .23 | .92 | .005 |

**Model: CNN**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .57 | .92 | .44 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .52 | .94 | .46 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .67 | .57 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .73 | .21 | .92 | .04 |

**Model: CNN**

**Layer: GRU**

**Embedding: concat**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .92 | .44 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .89 | .53 | .94 | .47 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .66 | .54 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .74 | .22 | .92 | .03 |

**Model: CNN – Focal Loss Function**

**Layer: GRU**

**Embedding: fasttext**

Problem Type: Hospital Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .58 | .91 | .34 |

Problem Type: ICU Mortality

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .88 | .51 | .94 | .30 |

Problem Type: Length of Stay 3

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .70 | .64 | .62 | .28 |

Problem Type: Length of Stay 7

|  |  |  |  |
| --- | --- | --- | --- |
| **AUC** | **AUCPRC** | **Accuracy** | **F1** |
| .72 | .21 | .92 | .02 |