# train

2021-04-11 17:29:00.620139: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudart64\_101.dll

2021-04-11 17:29:02.457988: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library nvcuda.dll

2021-04-11 17:29:02.478052: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1716] Found device 0 with properties:

pciBusID: 0000:01:00.0 name: NVIDIA GeForce RTX 2070 SUPER computeCapability: 7.5

coreClock: 1.815GHz coreCount: 40 deviceMemorySize: 8.00GiB deviceMemoryBandwidth: 417.29GiB/s

2021-04-11 17:29:02.478213: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudart64\_101.dll

2021-04-11 17:29:02.480647: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cublas64\_10.dll

2021-04-11 17:29:02.482666: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cufft64\_10.dll

2021-04-11 17:29:02.483344: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library curand64\_10.dll

2021-04-11 17:29:02.486060: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cusolver64\_10.dll

2021-04-11 17:29:02.488074: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cusparse64\_10.dll

2021-04-11 17:29:02.494033: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudnn64\_7.dll

2021-04-11 17:29:02.494169: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1858] Adding visible gpu devices: 0

2021-04-11 17:29:03.930376: I tensorflow/core/platform/cpu\_feature\_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN)to use the following CPU instructions in performance-critical operations: AVX2

To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

2021-04-11 17:29:03.936667: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1c5090f0560 initialized for platform Host (this does not guarantee that XLA will be used). Devices:

2021-04-11 17:29:03.936780: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version

2021-04-11 17:29:03.936965: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1716] Found device 0 with properties:

pciBusID: 0000:01:00.0 name: NVIDIA GeForce RTX 2070 SUPER computeCapability: 7.5

coreClock: 1.815GHz coreCount: 40 deviceMemorySize: 8.00GiB deviceMemoryBandwidth: 417.29GiB/s

2021-04-11 17:29:03.937119: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudart64\_101.dll

2021-04-11 17:29:03.937206: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cublas64\_10.dll

2021-04-11 17:29:03.937317: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cufft64\_10.dll

2021-04-11 17:29:03.937442: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library curand64\_10.dll

2021-04-11 17:29:03.937549: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cusolver64\_10.dll

2021-04-11 17:29:03.937623: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cusparse64\_10.dll

2021-04-11 17:29:03.937746: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudnn64\_7.dll

2021-04-11 17:29:03.937900: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1858] Adding visible gpu devices: 0

2021-04-11 17:29:04.347773: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:

2021-04-11 17:29:04.347859: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1263] 0

2021-04-11 17:29:04.347908: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1276] 0: N

2021-04-11 17:29:04.348133: I tensorflow/core/common\_runtime/gpu/gpu\_device.cc:1402] Created TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 6205 MB memory) -> physical GPU (device: 0, name: NVIDIA GeForce RTX 2070 SUPER, pci bus id: 0000:01:00.0, compute capability: 7.5)

2021-04-11 17:29:04.350631: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1c59395ca10 initialized for platform CUDA (this does not guarantee that XLA will be used). Devices:

2021-04-11 17:29:04.350944: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): NVIDIA GeForce RTX 2070 SUPER, Compute Capability 7.5

Model: "functional\_1"

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Layer (type) Output Shape Param # Connected to

==================================================================================================

input\_1 (InputLayer) [(None, 3000)] 0

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input\_2 (InputLayer) [(None, 2000)] 0

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embedding (Embedding) (None, 3000, 100) 409700 input\_1[0][0]

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embedding\_1 (Embedding) (None, 2000, 100) 409700 input\_2[0][0]

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sequential (Sequential) (None, 100, 64) 384320 embedding[0][0]

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sequential\_1 (Sequential) (None, 100, 64) 256320 embedding\_1[0][0]

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gru1 (Bidirectional) (None, 100, 100) 34800 sequential[0][0]

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gru2 (Bidirectional) (None, 100, 100) 34800 sequential\_1[0][0]

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att\_layer\_1 (AttLayer\_1) (None, 100) 5100 gru1[0][0]

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att\_layer\_2 (AttLayer\_2) (None, 100) 5100 gru2[0][0]

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subtract (Subtract) (None, 100) 0 att\_layer\_1[0][0]

att\_layer\_2[0][0]

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multiply (Multiply) (None, 100) 0 att\_layer\_1[0][0]

att\_layer\_2[0][0]

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concatenate (Concatenate) (None, 400) 0 att\_layer\_1[0][0]

att\_layer\_2[0][0]

subtract[0][0]

multiply[0][0]

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batch\_normalization\_2 (BatchNor (None, 400) 1600 concatenate[0][0]

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dropout\_2 (Dropout) (None, 400) 0 batch\_normalization\_2[0][0]

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dense (Dense) (None, 512) 205312 dropout\_2[0][0]

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batch\_normalization\_3 (BatchNor (None, 512) 2048 dense[0][0]

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activation\_2 (Activation) (None, 512) 0 batch\_normalization\_3[0][0]

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dropout\_3 (Dropout) (None, 512) 0 activation\_2[0][0]

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dense\_1 (Dense) (None, 1) 513 dropout\_3[0][0]

==================================================================================================

Total params: 1,749,313

Trainable params: 1,747,233

Non-trainable params: 2,080

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Traing X5628FC cell line specific model ...

Epoch 1/1000

2021-04-11 17:29:11.259010: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cublas64\_10.dll

2021-04-11 17:29:11.488366: I tensorflow/stream\_executor/platform/default/dso\_loader.cc:48] Successfully opened dynamic library cudnn64\_7.dll

2021-04-11 17:29:12.284186: W tensorflow/stream\_executor/gpu/redzone\_allocator.cc:314] Internal: Invoking GPU asm compilation is supported on Cuda non-Windows platforms only

Relying on driver to perform ptx compilation.

Modify $PATH to customize ptxas location.

This message will be only logged once.

1538/1538 [==============================] - 115s 75ms/step - loss: 0.8708 - accuracy: 0.5261 - val\_loss: 0.7033 - val\_accuracy: 0.5741

Epoch 2/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.8120 - accuracy: 0.5406 - val\_loss: 0.6928 - val\_accuracy: 0.5835

Epoch 3/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.8020 - accuracy: 0.5446 - val\_loss: 0.6880 - val\_accuracy: 0.5889

Epoch 4/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7951 - accuracy: 0.5429 - val\_loss: 0.6836 - val\_accuracy: 0.5914

Epoch 5/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7882 - accuracy: 0.5460 - val\_loss: 0.6774 - val\_accuracy: 0.5955

Epoch 6/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.7790 - accuracy: 0.5486 - val\_loss: 0.6784 - val\_accuracy: 0.6017

Epoch 7/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7724 - accuracy: 0.5507 - val\_loss: 0.6737 - val\_accuracy: 0.6089

Epoch 8/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7659 - accuracy: 0.5572 - val\_loss: 0.6702 - val\_accuracy: 0.6109

Epoch 9/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7611 - accuracy: 0.5556 - val\_loss: 0.6684 - val\_accuracy: 0.6149

Epoch 10/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7580 - accuracy: 0.5592 - val\_loss: 0.6637 - val\_accuracy: 0.6236

Epoch 11/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7455 - accuracy: 0.5679 - val\_loss: 0.6597 - val\_accuracy: 0.6269

Epoch 12/1000

1538/1538 [==============================] - 116s 75ms/step - loss: 0.7446 - accuracy: 0.5658 - val\_loss: 0.6553 - val\_accuracy: 0.6331

Epoch 13/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7380 - accuracy: 0.5707 - val\_loss: 0.6569 - val\_accuracy: 0.6376

Epoch 14/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7317 - accuracy: 0.5783 - val\_loss: 0.6451 - val\_accuracy: 0.6420

Epoch 15/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.7242 - accuracy: 0.5866 - val\_loss: 0.6463 - val\_accuracy: 0.6448

Epoch 16/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.7171 - accuracy: 0.5921 - val\_loss: 0.6423 - val\_accuracy: 0.6474

Epoch 17/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7092 - accuracy: 0.5962 - val\_loss: 0.6383 - val\_accuracy: 0.6520

Epoch 18/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.7047 - accuracy: 0.6027 - val\_loss: 0.6366 - val\_accuracy: 0.6552

Epoch 19/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6971 - accuracy: 0.6091 - val\_loss: 0.6275 - val\_accuracy: 0.6578

Epoch 20/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6879 - accuracy: 0.6160 - val\_loss: 0.6194 - val\_accuracy: 0.6639

Epoch 21/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6823 - accuracy: 0.6227 - val\_loss: 0.6143 - val\_accuracy: 0.6680

Epoch 22/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6757 - accuracy: 0.6257 - val\_loss: 0.6118 - val\_accuracy: 0.6728

Epoch 23/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6701 - accuracy: 0.6324 - val\_loss: 0.6053 - val\_accuracy: 0.6736

Epoch 24/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6607 - accuracy: 0.6420 - val\_loss: 0.6043 - val\_accuracy: 0.6803

Epoch 25/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.6553 - accuracy: 0.6448 - val\_loss: 0.5974 - val\_accuracy: 0.6844

Epoch 26/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6465 - accuracy: 0.6517 - val\_loss: 0.5927 - val\_accuracy: 0.6907

Epoch 27/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.6390 - accuracy: 0.6604 - val\_loss: 0.5868 - val\_accuracy: 0.6959

Epoch 28/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6300 - accuracy: 0.6636 - val\_loss: 0.5927 - val\_accuracy: 0.6951

Epoch 29/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6263 - accuracy: 0.6708 - val\_loss: 0.5824 - val\_accuracy: 0.7007

Epoch 30/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6110 - accuracy: 0.6822 - val\_loss: 0.5825 - val\_accuracy: 0.7014

Epoch 31/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.6104 - accuracy: 0.6838 - val\_loss: 0.5769 - val\_accuracy: 0.7066

Epoch 32/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.6056 - accuracy: 0.6860 - val\_loss: 0.5823 - val\_accuracy: 0.7081

Epoch 33/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.5989 - accuracy: 0.6947 - val\_loss: 0.5728 - val\_accuracy: 0.7117

Epoch 34/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.5883 - accuracy: 0.6998 - val\_loss: 0.5839 - val\_accuracy: 0.7104

Epoch 35/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5872 - accuracy: 0.7018 - val\_loss: 0.5740 - val\_accuracy: 0.7109

Epoch 36/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5852 - accuracy: 0.7021 - val\_loss: 0.5732 - val\_accuracy: 0.7173

Epoch 37/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5775 - accuracy: 0.7084 - val\_loss: 0.5758 - val\_accuracy: 0.7135

Epoch 38/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.5708 - accuracy: 0.7123 - val\_loss: 0.5808 - val\_accuracy: 0.7096

Epoch 39/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5640 - accuracy: 0.7168 - val\_loss: 0.5664 - val\_accuracy: 0.7227

Epoch 40/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5580 - accuracy: 0.7214 - val\_loss: 0.5661 - val\_accuracy: 0.7280

Epoch 41/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5559 - accuracy: 0.7235 - val\_loss: 0.5599 - val\_accuracy: 0.7290

Epoch 42/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5482 - accuracy: 0.7286 - val\_loss: 0.5670 - val\_accuracy: 0.7280

Epoch 43/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5437 - accuracy: 0.7311 - val\_loss: 0.5665 - val\_accuracy: 0.7301

Epoch 44/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5376 - accuracy: 0.7347 - val\_loss: 0.5660 - val\_accuracy: 0.7296

Epoch 45/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5358 - accuracy: 0.7372 - val\_loss: 0.5625 - val\_accuracy: 0.7331

Epoch 46/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5298 - accuracy: 0.7432 - val\_loss: 0.5655 - val\_accuracy: 0.7328

Epoch 47/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5260 - accuracy: 0.7446 - val\_loss: 0.5632 - val\_accuracy: 0.7346

Epoch 48/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5220 - accuracy: 0.7481 - val\_loss: 0.5848 - val\_accuracy: 0.7226

Epoch 49/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5132 - accuracy: 0.7532 - val\_loss: 0.5773 - val\_accuracy: 0.7308

Epoch 50/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5099 - accuracy: 0.7551 - val\_loss: 0.5626 - val\_accuracy: 0.7400

Epoch 51/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5092 - accuracy: 0.7576 - val\_loss: 0.5631 - val\_accuracy: 0.7402

Epoch 52/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5019 - accuracy: 0.7601 - val\_loss: 0.5643 - val\_accuracy: 0.7370

Epoch 53/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.5044 - accuracy: 0.7605 - val\_loss: 0.5687 - val\_accuracy: 0.7392

Epoch 54/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4975 - accuracy: 0.7635 - val\_loss: 0.5803 - val\_accuracy: 0.7366

Epoch 55/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4905 - accuracy: 0.7691 - val\_loss: 0.5746 - val\_accuracy: 0.7389

Epoch 56/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4898 - accuracy: 0.7683 - val\_loss: 0.5697 - val\_accuracy: 0.7384

Epoch 57/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4856 - accuracy: 0.7719 - val\_loss: 0.5658 - val\_accuracy: 0.7428

Epoch 58/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4824 - accuracy: 0.7732 - val\_loss: 0.5745 - val\_accuracy: 0.7413

Epoch 59/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4797 - accuracy: 0.7760 - val\_loss: 0.5709 - val\_accuracy: 0.7410

Epoch 60/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4744 - accuracy: 0.7788 - val\_loss: 0.5757 - val\_accuracy: 0.7417

Epoch 61/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4709 - accuracy: 0.7786 - val\_loss: 0.5679 - val\_accuracy: 0.7456

Epoch 62/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4708 - accuracy: 0.7821 - val\_loss: 0.5936 - val\_accuracy: 0.7349

Epoch 63/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.4607 - accuracy: 0.7863 - val\_loss: 0.5708 - val\_accuracy: 0.7453

Epoch 64/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.4640 - accuracy: 0.7854 - val\_loss: 0.5909 - val\_accuracy: 0.7410

Epoch 65/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4599 - accuracy: 0.7861 - val\_loss: 0.5744 - val\_accuracy: 0.7454

Epoch 66/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4515 - accuracy: 0.7919 - val\_loss: 0.5767 - val\_accuracy: 0.7438

Epoch 67/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4504 - accuracy: 0.7914 - val\_loss: 0.5735 - val\_accuracy: 0.7443

Epoch 68/1000

1538/1538 [==============================] - 116s 75ms/step - loss: 0.4492 - accuracy: 0.7943 - val\_loss: 0.5799 - val\_accuracy: 0.7430

Epoch 69/1000

1538/1538 [==============================] - 118s 77ms/step - loss: 0.4424 - accuracy: 0.7966 - val\_loss: 0.5916 - val\_accuracy: 0.7420

Epoch 70/1000

1538/1538 [==============================] - 118s 77ms/step - loss: 0.4436 - accuracy: 0.7958 - val\_loss: 0.5795 - val\_accuracy: 0.7477

Epoch 71/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4365 - accuracy: 0.8013 - val\_loss: 0.5753 - val\_accuracy: 0.7497

Epoch 72/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4373 - accuracy: 0.8016 - val\_loss: 0.5883 - val\_accuracy: 0.7487

Epoch 73/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4288 - accuracy: 0.8042 - val\_loss: 0.5847 - val\_accuracy: 0.7449

Epoch 74/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4287 - accuracy: 0.8048 - val\_loss: 0.5901 - val\_accuracy: 0.7484

Epoch 75/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4247 - accuracy: 0.8085 - val\_loss: 0.5790 - val\_accuracy: 0.7484

Epoch 76/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4239 - accuracy: 0.8077 - val\_loss: 0.5973 - val\_accuracy: 0.7461

Epoch 77/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4236 - accuracy: 0.8087 - val\_loss: 0.5860 - val\_accuracy: 0.7472

Epoch 78/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4148 - accuracy: 0.8143 - val\_loss: 0.5879 - val\_accuracy: 0.7482

Epoch 79/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4132 - accuracy: 0.8120 - val\_loss: 0.6006 - val\_accuracy: 0.7400

Epoch 80/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4096 - accuracy: 0.8151 - val\_loss: 0.6007 - val\_accuracy: 0.7431

Epoch 81/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4076 - accuracy: 0.8170 - val\_loss: 0.5982 - val\_accuracy: 0.7471

Epoch 82/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4048 - accuracy: 0.8171 - val\_loss: 0.5948 - val\_accuracy: 0.7512

Epoch 83/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4004 - accuracy: 0.8205 - val\_loss: 0.6256 - val\_accuracy: 0.7451

Epoch 84/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4033 - accuracy: 0.8204 - val\_loss: 0.5977 - val\_accuracy: 0.7454

Epoch 85/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.4009 - accuracy: 0.8200 - val\_loss: 0.6042 - val\_accuracy: 0.7519

Epoch 86/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3946 - accuracy: 0.8230 - val\_loss: 0.6006 - val\_accuracy: 0.7520

Epoch 87/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3903 - accuracy: 0.8256 - val\_loss: 0.6026 - val\_accuracy: 0.7537

Epoch 88/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3886 - accuracy: 0.8278 - val\_loss: 0.6073 - val\_accuracy: 0.7538

Epoch 89/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3852 - accuracy: 0.8282 - val\_loss: 0.6028 - val\_accuracy: 0.7522

Epoch 90/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3817 - accuracy: 0.8286 - val\_loss: 0.6127 - val\_accuracy: 0.7494

Epoch 91/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3770 - accuracy: 0.8334 - val\_loss: 0.6145 - val\_accuracy: 0.7527

Epoch 92/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3799 - accuracy: 0.8333 - val\_loss: 0.6316 - val\_accuracy: 0.7504

Epoch 93/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3766 - accuracy: 0.8337 - val\_loss: 0.6323 - val\_accuracy: 0.7468

Epoch 94/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3706 - accuracy: 0.8368 - val\_loss: 0.6175 - val\_accuracy: 0.7502

Epoch 95/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3702 - accuracy: 0.8357 - val\_loss: 0.6184 - val\_accuracy: 0.7532

Epoch 96/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3650 - accuracy: 0.8384 - val\_loss: 0.6230 - val\_accuracy: 0.7535

Epoch 97/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3655 - accuracy: 0.8399 - val\_loss: 0.6346 - val\_accuracy: 0.7489

Epoch 98/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3615 - accuracy: 0.8405 - val\_loss: 0.6571 - val\_accuracy: 0.7469

Epoch 99/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3551 - accuracy: 0.8448 - val\_loss: 0.6446 - val\_accuracy: 0.7533

Epoch 100/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3530 - accuracy: 0.8458 - val\_loss: 0.6331 - val\_accuracy: 0.7502

Epoch 101/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3544 - accuracy: 0.8468 - val\_loss: 0.6299 - val\_accuracy: 0.7525

Epoch 102/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3476 - accuracy: 0.8478 - val\_loss: 0.6438 - val\_accuracy: 0.7504

Epoch 103/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3423 - accuracy: 0.8496 - val\_loss: 0.6440 - val\_accuracy: 0.7510

Epoch 104/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3457 - accuracy: 0.8503 - val\_loss: 0.6556 - val\_accuracy: 0.7469

Epoch 105/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3424 - accuracy: 0.8503 - val\_loss: 0.6649 - val\_accuracy: 0.7487

Epoch 106/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3389 - accuracy: 0.8529 - val\_loss: 0.6633 - val\_accuracy: 0.7514

Epoch 107/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3391 - accuracy: 0.8508 - val\_loss: 0.6617 - val\_accuracy: 0.7525

Epoch 108/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3350 - accuracy: 0.8556 - val\_loss: 0.6643 - val\_accuracy: 0.7472

Epoch 109/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3338 - accuracy: 0.8546 - val\_loss: 0.6654 - val\_accuracy: 0.7555

Epoch 110/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3288 - accuracy: 0.8574 - val\_loss: 0.6936 - val\_accuracy: 0.7449

Epoch 111/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3274 - accuracy: 0.8557 - val\_loss: 0.6713 - val\_accuracy: 0.7535

Epoch 112/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3268 - accuracy: 0.8589 - val\_loss: 0.6817 - val\_accuracy: 0.7495

Epoch 113/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3259 - accuracy: 0.8577 - val\_loss: 0.6640 - val\_accuracy: 0.7543

Epoch 114/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3210 - accuracy: 0.8606 - val\_loss: 0.6755 - val\_accuracy: 0.7542

Epoch 115/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3182 - accuracy: 0.8622 - val\_loss: 0.6812 - val\_accuracy: 0.7568

Epoch 116/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3171 - accuracy: 0.8620 - val\_loss: 0.7113 - val\_accuracy: 0.7461

Epoch 117/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3105 - accuracy: 0.8660 - val\_loss: 0.7194 - val\_accuracy: 0.7464

Epoch 118/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3176 - accuracy: 0.8628 - val\_loss: 0.6814 - val\_accuracy: 0.7520

Epoch 119/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3120 - accuracy: 0.8654 - val\_loss: 0.7523 - val\_accuracy: 0.7392

Epoch 120/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3100 - accuracy: 0.8669 - val\_loss: 0.6785 - val\_accuracy: 0.7533

Epoch 121/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.3062 - accuracy: 0.8671 - val\_loss: 0.6809 - val\_accuracy: 0.7530

Epoch 122/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3020 - accuracy: 0.8705 - val\_loss: 0.6887 - val\_accuracy: 0.7523

Epoch 123/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.3004 - accuracy: 0.8718 - val\_loss: 0.7042 - val\_accuracy: 0.7497

Epoch 124/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2999 - accuracy: 0.8707 - val\_loss: 0.7654 - val\_accuracy: 0.7438

Epoch 125/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.2959 - accuracy: 0.8738 - val\_loss: 0.6991 - val\_accuracy: 0.7568

Epoch 126/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2949 - accuracy: 0.8721 - val\_loss: 0.6992 - val\_accuracy: 0.7533

Epoch 127/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2934 - accuracy: 0.8743 - val\_loss: 0.7015 - val\_accuracy: 0.7546

Epoch 128/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2892 - accuracy: 0.8761 - val\_loss: 0.7170 - val\_accuracy: 0.7527

Epoch 129/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2875 - accuracy: 0.8771 - val\_loss: 0.7168 - val\_accuracy: 0.7522

Epoch 130/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2874 - accuracy: 0.8778 - val\_loss: 0.7109 - val\_accuracy: 0.7535

Epoch 131/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2843 - accuracy: 0.8801 - val\_loss: 0.7697 - val\_accuracy: 0.7459

Epoch 132/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2819 - accuracy: 0.8801 - val\_loss: 0.7379 - val\_accuracy: 0.7499

Epoch 133/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2816 - accuracy: 0.8809 - val\_loss: 0.7343 - val\_accuracy: 0.7523

Epoch 134/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2814 - accuracy: 0.8805 - val\_loss: 0.7354 - val\_accuracy: 0.7468

Epoch 135/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.2736 - accuracy: 0.8830 - val\_loss: 0.7555 - val\_accuracy: 0.7492

Epoch 136/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.2777 - accuracy: 0.8834 - val\_loss: 0.7389 - val\_accuracy: 0.7542

Epoch 137/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2745 - accuracy: 0.8852 - val\_loss: 0.7404 - val\_accuracy: 0.7517

Epoch 138/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2722 - accuracy: 0.8846 - val\_loss: 0.7504 - val\_accuracy: 0.7537

Epoch 139/1000

1538/1538 [==============================] - 115s 75ms/step - loss: 0.2670 - accuracy: 0.8856 - val\_loss: 0.7583 - val\_accuracy: 0.7487

Epoch 140/1000

1538/1538 [==============================] - 115s 74ms/step - loss: 0.2671 - accuracy: 0.8878 - val\_loss: 0.7830 - val\_accuracy: 0.7502

Epoch 141/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2660 - accuracy: 0.8878 - val\_loss: 0.7569 - val\_accuracy: 0.7558

Epoch 142/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2628 - accuracy: 0.8901 - val\_loss: 0.7942 - val\_accuracy: 0.7482

Epoch 143/1000

1538/1538 [==============================] - 114s 74ms/step - loss: 0.2609 - accuracy: 0.8901 - val\_loss: 0.7676 - val\_accuracy: 0.7550

Epoch 144/1000

1538/1538 [==============================] - 117s 76ms/step - loss: 0.2552 - accuracy: 0.8933 - val\_loss: 0.7820 - val\_accuracy: 0.7522

Epoch 145/1000

1538/1538 [==============================] - 118s 77ms/step - loss: 0.2614 - accuracy: 0.8893 - val\_loss: 0.8308 - val\_accuracy: 0.7479

保存的地方报错，完全没关系，不影响程序运行

Traceback (most recent call last):

File "E:/iu/X5628FC\_最终/DNA2VEC/train.py", line 169, in <module>

model.save('dna2vec\_best\_model.h5')

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\engine\training.py", line 1978, in save

save.save\_model(self, filepath, overwrite, include\_optimizer, save\_format,

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\saving\save.py", line 130, in save\_model

hdf5\_format.save\_model\_to\_hdf5(

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\saving\hdf5\_format.py", line 109, in save\_model\_to\_hdf5

model\_metadata = saving\_utils.model\_metadata(model, include\_optimizer)

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\saving\saving\_utils.py", line 157, in model\_metadata

raise e

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\saving\saving\_utils.py", line 154, in model\_metadata

model\_config['config'] = model.get\_config()

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\engine\functional.py", line 598, in get\_config

return copy.deepcopy(get\_network\_config(self))

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\engine\functional.py", line 1278, in get\_network\_config

layer\_config = serialize\_layer\_fn(layer)

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\utils\generic\_utils.py", line 250, in serialize\_keras\_object

raise e

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\utils\generic\_utils.py", line 245, in serialize\_keras\_object

config = instance.get\_config()

File "C:\Users\bizi\AppData\Local\Programs\Python\Python38\lib\site-packages\tensorflow\python\keras\engine\base\_layer.py", line 676, in get\_config

raise NotImplementedError('Layer %s has arguments in `\_\_init\_\_` and '

NotImplementedError: Layer AttLayer\_1 has arguments in `\_\_init\_\_` and therefore must override `get\_config`.

Process finished with exit code 1

# test

epoch = 0 gc.collect() = 4691

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