

File - run

```
1 ssh://root@103.254.67.181:10006/usr/bin/python -u /home/sunfengzhen/pycharm/dadi_typhoon/run.py
2 Using TensorFlow backend.
3 work mode train
4 train_size 176
5 txt_path dataset/Train/Track/Track.txt
6 type typhoon_seq <type 'numpy.ndarray'>
7 typhoon_seq.shape (176, 16, 5)
8 i_max_val 6.0
9 i_min_val 0.0
10 lat_max_val 485.0
11 lat_min_val 92.0
12 lon_max_val 1885.0
13 lon_min_val 1052.0
14 press_max_val 1010.0
15 press_min_val 888.0
16 wnd_max_val 72.0
17 wnd_min_val 10.0
18 trainX.shape: (166, 4, 5)
19 trainY.shape: (166, 4, 2)
20 validX.shape: (10, 4, 5)
21 validY.shape: (10, 4, 2)
22 trainX[0]
23 [[0.66666667 0.43256997 0.25330132 0.67213115 0.40322581]
24 [0.66666667 0.45547074 0.25090036 0.67213115 0.40322581]
25 [0.66666667 0.4783715 0.25570228 0.67213115 0.40322581]
26 [0.66666667 0.50636132 0.26170468 0.63114754 0.40322581]]
27 trainY[0]
28 : [[0.54707379 0.26890756]
29 [0.59287532 0.27130852]
30 [0.63867684 0.27130852]
31 [0.67938931 0.2785114 ]]
32 hello world
33 #####model build#####
34
35 Layer (type)          Output Shape          Param #
36 =====
37 LSTM_layer01 (LSTM)    (None, 4, 64)         17920
38
39 LSTM_layer02 (LSTM)    (None, 4, 64)         33024
40
41 LSTM_layer03 (LSTM)    (None, 4, 2)          536
42 =====
43 Total params: 51,480
44 Trainable params: 51,480
45 Non-trainable params: 0
46
47 model.input= Tensor("LSTM_layer01_input:0", shape=(?, 4, 5), dtype=float32)
48 model.input.name= LSTM_layer01_input:0
49 model.input.shape= (?, 4, 5)
50 model.output= Tensor("LSTM_layer03/transpose_1:0", shape=(?, ?, 2), dtype=float32)
51 model.output.name= LSTM_layer03/transpose_1:0
52 model.output.shape= (?, ?, 2)
53 #####model train#####
54 model.metrics_names = ['loss', 'mean_squared_error']
55 Train on 166 samples, validate on 10 samples
56 Epoch 1/1000
57 2019-10-14 01:59:03.012484: I tensorflow/core/platform/cpu_feature_guard.cc:141] Your CPU supports
instructions that this TensorFlow binary was not compiled to use: AVX2 FMA
58 2019-10-14 01:59:04.041854: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1432] Found device 0 with
properties:
59 name: GeForce GTX 1080 Ti major: 6 minor: 1 memoryClockRate(GHz): 1.582
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60 pciBusID: 0000:82:00.0
61 totalMemory: 10.92GiB freeMemory: 10.76GiB
62 2019-10-14 01:59:04.041917: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1511] Adding visible gpu
devices: 0
63 2019-10-14 01:59:04.553057: I tensorflow/core/common_runtime/gpu/gpu_device.cc:982] Device interconnect
StreamExecutor with strength 1 edge matrix:
64 2019-10-14 01:59:04.553148: I tensorflow/core/common_runtime/gpu/gpu_device.cc:988] 0
65 2019-10-14 01:59:04.553168: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1001] 0: N
66 2019-10-14 01:59:04.553529: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1115] Created TensorFlow
device (/job:localhost/replica:0/task:0/device:GPU:0 with 10409 MB memory) -> physical GPU (device: 0,
name: GeForce GTX 1080 Ti, pci bus id: 0000:82:00.0, compute capability: 6.1)
67 - 7s - loss: 0.1140 - mean_squared_error: 0.1140 - val_loss: 0.0990 - val_mean_squared_error: 0.0990
68 epoch_end_callback epoch 0 lr 0.001
69 Epoch 2/1000
70 - 1s - loss: 0.0653 - mean_squared_error: 0.0653 - val_loss: 0.0755 - val_mean_squared_error: 0.0755
71 epoch_end_callback epoch 1 lr 0.001
72 Epoch 3/1000
73 - 1s - loss: 0.0539 - mean_squared_error: 0.0539 - val_loss: 0.0628 - val_mean_squared_error: 0.0628
74 epoch_end_callback epoch 2 lr 0.001
75 Epoch 4/1000
76 - 1s - loss: 0.0458 - mean_squared_error: 0.0458 - val_loss: 0.0541 - val_mean_squared_error: 0.0541
77 epoch_end_callback epoch 3 lr 0.001
78 Epoch 5/1000
79 - 1s - loss: 0.0396 - mean_squared_error: 0.0396 - val_loss: 0.0466 - val_mean_squared_error: 0.0466
80 epoch_end_callback epoch 4 lr 0.001
81 Epoch 6/1000
82 - 1s - loss: 0.0354 - mean_squared_error: 0.0354 - val_loss: 0.0439 - val_mean_squared_error: 0.0439
83 epoch_end_callback epoch 5 lr 0.001
84 Epoch 7/1000
85 - 1s - loss: 0.0337 - mean_squared_error: 0.0337 - val_loss: 0.0405 - val_mean_squared_error: 0.0405
86 epoch_end_callback epoch 6 lr 0.001
87 Epoch 8/1000
88 - 1s - loss: 0.0317 - mean_squared_error: 0.0317 - val_loss: 0.0350 - val_mean_squared_error: 0.0350
89 epoch_end_callback epoch 7 lr 0.001
90 Epoch 9/1000
91 - 1s - loss: 0.0284 - mean_squared_error: 0.0284 - val_loss: 0.0295 - val_mean_squared_error: 0.0295
92 epoch_end_callback epoch 8 lr 0.001
93 Epoch 10/1000
94 - 1s - loss: 0.0256 - mean_squared_error: 0.0256 - val_loss: 0.0245 - val_mean_squared_error: 0.0245
95
96 Epoch 00010: saving model to model/model_best.h5
97 epoch_end_callback epoch 9 lr 0.001
98 Epoch 11/1000
99 - 1s - loss: 0.0224 - mean_squared_error: 0.0224 - val_loss: 0.0216 - val_mean_squared_error: 0.0216
100 epoch_end_callback epoch 10 lr 0.001
101 Epoch 12/1000
102 - 1s - loss: 0.0192 - mean_squared_error: 0.0192 - val_loss: 0.0188 - val_mean_squared_error: 0.0188
103 epoch_end_callback epoch 11 lr 0.001
104 Epoch 13/1000
105 - 1s - loss: 0.0189 - mean_squared_error: 0.0189 - val_loss: 0.0186 - val_mean_squared_error: 0.0186
106 epoch_end_callback epoch 12 lr 0.001
107 Epoch 14/1000
108 - 1s - loss: 0.0170 - mean_squared_error: 0.0170 - val_loss: 0.0167 - val_mean_squared_error: 0.0167
109 epoch_end_callback epoch 13 lr 0.001
110 Epoch 15/1000
111 - 1s - loss: 0.0164 - mean_squared_error: 0.0164 - val_loss: 0.0155 - val_mean_squared_error: 0.0155
112 epoch_end_callback epoch 14 lr 0.001
113 Epoch 16/1000
114 - 1s - loss: 0.0156 - mean_squared_error: 0.0156 - val_loss: 0.0152 - val_mean_squared_error: 0.0152
115 epoch_end_callback epoch 15 lr 0.001
116 Epoch 17/1000
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117 - 1s - loss: 0.0148 - mean_squared_error: 0.0148 - val_loss: 0.0144 - val_mean_squared_error: 0.0144
118 epoch_end_callback epoch 16 lr 0.001
119 Epoch 18/1000
120 - 1s - loss: 0.0139 - mean_squared_error: 0.0139 - val_loss: 0.0131 - val_mean_squared_error: 0.0131
121 epoch_end_callback epoch 17 lr 0.001
122 Epoch 19/1000
123 - 1s - loss: 0.0128 - mean_squared_error: 0.0128 - val_loss: 0.0129 - val_mean_squared_error: 0.0129
124 epoch_end_callback epoch 18 lr 0.001
125 Epoch 20/1000
126 - 1s - loss: 0.0131 - mean_squared_error: 0.0131 - val_loss: 0.0115 - val_mean_squared_error: 0.0115
127
128 Epoch 00020: saving model to model/model_best.h5
129 epoch_end_callback epoch 19 lr 0.001
130 Epoch 21/1000
131 - 1s - loss: 0.0117 - mean_squared_error: 0.0117 - val_loss: 0.0110 - val_mean_squared_error: 0.0110
132 epoch_end_callback epoch 20 lr 0.001
133 Epoch 22/1000
134 - 1s - loss: 0.0113 - mean_squared_error: 0.0113 - val_loss: 0.0104 - val_mean_squared_error: 0.0104
135 epoch_end_callback epoch 21 lr 0.001
136 Epoch 23/1000
137 - 1s - loss: 0.0107 - mean_squared_error: 0.0107 - val_loss: 0.0098 - val_mean_squared_error: 0.0098
138 epoch_end_callback epoch 22 lr 0.001
139 Epoch 24/1000
140 - 1s - loss: 0.0103 - mean_squared_error: 0.0103 - val_loss: 0.0087 - val_mean_squared_error: 0.0087
141 epoch_end_callback epoch 23 lr 0.001
142 Epoch 25/1000
143 - 1s - loss: 0.0107 - mean_squared_error: 0.0107 - val_loss: 0.0098 - val_mean_squared_error: 0.0098
144 epoch_end_callback epoch 24 lr 0.001
145 Epoch 26/1000
146 - 1s - loss: 0.0103 - mean_squared_error: 0.0103 - val_loss: 0.0082 - val_mean_squared_error: 0.0082
147 epoch_end_callback epoch 25 lr 0.001
148 Epoch 27/1000
149 - 1s - loss: 0.0097 - mean_squared_error: 0.0097 - val_loss: 0.0076 - val_mean_squared_error: 0.0076
150 epoch_end_callback epoch 26 lr 0.001
151 Epoch 28/1000
152 - 1s - loss: 0.0090 - mean_squared_error: 0.0090 - val_loss: 0.0076 - val_mean_squared_error: 0.0076
153 epoch_end_callback epoch 27 lr 0.001
154 Epoch 29/1000
155 - 1s - loss: 0.0087 - mean_squared_error: 0.0087 - val_loss: 0.0070 - val_mean_squared_error: 0.0070
156 epoch_end_callback epoch 28 lr 0.001
157 Epoch 30/1000
158 - 1s - loss: 0.0095 - mean_squared_error: 0.0095 - val_loss: 0.0064 - val_mean_squared_error: 0.0064
159
160 Epoch 00030: saving model to model/model_best.h5
161 epoch_end_callback epoch 29 lr 0.001
162 Epoch 31/1000
163 - 1s - loss: 0.0078 - mean_squared_error: 0.0078 - val_loss: 0.0061 - val_mean_squared_error: 0.0061
164 epoch_end_callback epoch 30 lr 0.001
165 Epoch 32/1000
166 - 1s - loss: 0.0082 - mean_squared_error: 0.0082 - val_loss: 0.0060 - val_mean_squared_error: 0.0060
167 epoch_end_callback epoch 31 lr 0.001
168 Epoch 33/1000
169 - 1s - loss: 0.0083 - mean_squared_error: 0.0083 - val_loss: 0.0055 - val_mean_squared_error: 0.0055
170 epoch_end_callback epoch 32 lr 0.001
171 Epoch 34/1000
172 - 1s - loss: 0.0078 - mean_squared_error: 0.0078 - val_loss: 0.0053 - val_mean_squared_error: 0.0053
173 epoch_end_callback epoch 33 lr 0.001
174 Epoch 35/1000
175 - 1s - loss: 0.0075 - mean_squared_error: 0.0075 - val_loss: 0.0055 - val_mean_squared_error: 0.0055
176 epoch_end_callback epoch 34 lr 0.001
177 Epoch 36/1000
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178 - 1s - loss: 0.0071 - mean_squared_error: 0.0071 - val_loss: 0.0053 - val_mean_squared_error: 0.0053
179 epoch_end_callback epoch 35 lr 0.001
180 Epoch 37/1000
181 - 1s - loss: 0.0074 - mean_squared_error: 0.0074 - val_loss: 0.0050 - val_mean_squared_error: 0.0050
182 epoch_end_callback epoch 36 lr 0.001
183 Epoch 38/1000
184 - 1s - loss: 0.0067 - mean_squared_error: 0.0067 - val_loss: 0.0054 - val_mean_squared_error: 0.0054
185 epoch_end_callback epoch 37 lr 0.001
186 Epoch 39/1000
187 - 1s - loss: 0.0070 - mean_squared_error: 0.0070 - val_loss: 0.0045 - val_mean_squared_error: 0.0045
188 epoch_end_callback epoch 38 lr 0.001
189 Epoch 40/1000
190 - 1s - loss: 0.0067 - mean_squared_error: 0.0067 - val_loss: 0.0049 - val_mean_squared_error: 0.0049
191
192 Epoch 0040: saving model to model/model_best.h5
193 epoch_end_callback epoch 39 lr 0.001
194 Epoch 41/1000
195 - 1s - loss: 0.0071 - mean_squared_error: 0.0071 - val_loss: 0.0050 - val_mean_squared_error: 0.0050
196 epoch_end_callback epoch 40 lr 0.001
197 Epoch 42/1000
198 - 1s - loss: 0.0066 - mean_squared_error: 0.0066 - val_loss: 0.0049 - val_mean_squared_error: 0.0049
199 epoch_end_callback epoch 41 lr 0.001
200 Epoch 43/1000
201 - 1s - loss: 0.0061 - mean_squared_error: 0.0061 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
202 epoch_end_callback epoch 42 lr 0.001
203 Epoch 44/1000
204 - 1s - loss: 0.0065 - mean_squared_error: 0.0065 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
205 epoch_end_callback epoch 43 lr 0.001
206 Epoch 45/1000
207 - 1s - loss: 0.0066 - mean_squared_error: 0.0066 - val_loss: 0.0052 - val_mean_squared_error: 0.0052
208 epoch_end_callback epoch 44 lr 0.001
209 Epoch 46/1000
210 - 1s - loss: 0.0062 - mean_squared_error: 0.0062 - val_loss: 0.0042 - val_mean_squared_error: 0.0042
211 epoch_end_callback epoch 45 lr 0.001
212 Epoch 47/1000
213 - 1s - loss: 0.0057 - mean_squared_error: 0.0057 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
214 epoch_end_callback epoch 46 lr 0.001
215 Epoch 48/1000
216 - 1s - loss: 0.0061 - mean_squared_error: 0.0061 - val_loss: 0.0042 - val_mean_squared_error: 0.0042
217 epoch_end_callback epoch 47 lr 0.001
218 Epoch 49/1000
219 - 1s - loss: 0.0064 - mean_squared_error: 0.0064 - val_loss: 0.0042 - val_mean_squared_error: 0.0042
220 epoch_end_callback epoch 48 lr 0.001
221 Epoch 50/1000
222 - 1s - loss: 0.0058 - mean_squared_error: 0.0058 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
223
224 Epoch 0050: saving model to model/model_best.h5
225 epoch_end_callback epoch 49 lr 0.001
226 Epoch 51/1000
227 - 1s - loss: 0.0062 - mean_squared_error: 0.0062 - val_loss: 0.0045 - val_mean_squared_error: 0.0045
228 epoch_end_callback epoch 50 lr 0.001
229 Epoch 52/1000
230 - 1s - loss: 0.0054 - mean_squared_error: 0.0054 - val_loss: 0.0049 - val_mean_squared_error: 0.0049
231 epoch_end_callback epoch 51 lr 0.001
232 Epoch 53/1000
233 - 1s - loss: 0.0056 - mean_squared_error: 0.0056 - val_loss: 0.0040 - val_mean_squared_error: 0.0040
234 epoch_end_callback epoch 52 lr 0.001
235 Epoch 54/1000
236 - 1s - loss: 0.0060 - mean_squared_error: 0.0060 - val_loss: 0.0040 - val_mean_squared_error: 0.0040
237 epoch_end_callback epoch 53 lr 0.001
238 Epoch 55/1000
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239 - 1s - loss: 0.0053 - mean_squared_error: 0.0053 - val_loss: 0.0037 - val_mean_squared_error: 0.0037
240 epoch_end_callback epoch 54 lr 0.001
241 Epoch 56/1000
242 - 1s - loss: 0.0055 - mean_squared_error: 0.0055 - val_loss: 0.0046 - val_mean_squared_error: 0.0046
243 epoch_end_callback epoch 55 lr 0.001
244 Epoch 57/1000
245 - 1s - loss: 0.0055 - mean_squared_error: 0.0055 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
246 epoch_end_callback epoch 56 lr 0.001
247 Epoch 58/1000
248 - 1s - loss: 0.0056 - mean_squared_error: 0.0056 - val_loss: 0.0045 - val_mean_squared_error: 0.0045
249 epoch_end_callback epoch 57 lr 0.001
250 Epoch 59/1000
251 - 1s - loss: 0.0058 - mean_squared_error: 0.0058 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
252 epoch_end_callback epoch 58 lr 0.001
253 Epoch 60/1000
254 - 1s - loss: 0.0050 - mean_squared_error: 0.0050 - val_loss: 0.0061 - val_mean_squared_error: 0.0061
255
256 Epoch 00060: saving model to model/model_best.h5
257 epoch_end_callback epoch 59 lr 0.001
258 Epoch 61/1000
259 - 1s - loss: 0.0054 - mean_squared_error: 0.0054 - val_loss: 0.0039 - val_mean_squared_error: 0.0039
260 epoch_end_callback epoch 60 lr 0.001
261 Epoch 62/1000
262 - 1s - loss: 0.0051 - mean_squared_error: 0.0051 - val_loss: 0.0037 - val_mean_squared_error: 0.0037
263 epoch_end_callback epoch 61 lr 0.001
264 Epoch 63/1000
265 - 1s - loss: 0.0055 - mean_squared_error: 0.0055 - val_loss: 0.0041 - val_mean_squared_error: 0.0041
266 epoch_end_callback epoch 62 lr 0.001
267 Epoch 64/1000
268 - 1s - loss: 0.0054 - mean_squared_error: 0.0054 - val_loss: 0.0039 - val_mean_squared_error: 0.0039
269 epoch_end_callback epoch 63 lr 0.001
270 Epoch 65/1000
271 - 1s - loss: 0.0053 - mean_squared_error: 0.0053 - val_loss: 0.0040 - val_mean_squared_error: 0.0040
272
273 Epoch 00065: ReduceLROnPlateau reducing learning rate to 0.00010000000475.
274 epoch_end_callback epoch 64 lr 0.001
275 Epoch 66/1000
276 - 1s - loss: 0.0050 - mean_squared_error: 0.0050 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
277 epoch_end_callback epoch 65 lr 0.0001000000005
278 Epoch 67/1000
279 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
280 epoch_end_callback epoch 66 lr 0.0001000000005
281 Epoch 68/1000
282 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
283 epoch_end_callback epoch 67 lr 0.0001000000005
284 Epoch 69/1000
285 - 1s - loss: 0.0052 - mean_squared_error: 0.0052 - val_loss: 0.0046 - val_mean_squared_error: 0.0046
286 epoch_end_callback epoch 68 lr 0.0001000000005
287 Epoch 70/1000
288 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0043 - val_mean_squared_error: 0.0043
289
290 Epoch 00070: saving model to model/model_best.h5
291 epoch_end_callback epoch 69 lr 0.0001000000005
292 Epoch 71/1000
293 - 1s - loss: 0.0050 - mean_squared_error: 0.0050 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
294 epoch_end_callback epoch 70 lr 0.0001000000005
295 Epoch 72/1000
296 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0045 - val_mean_squared_error: 0.0045
297 epoch_end_callback epoch 71 lr 0.0001000000005
298 Epoch 73/1000
299 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
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300 epoch_end_callback epoch 72 lr 0.000100000005
301 Epoch 74/1000
302   - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0044 - val_mean_squared_error: 0.0044
303 epoch_end_callback epoch 73 lr 0.000100000005
304 Epoch 75/1000
305   - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0046 - val_mean_squared_error: 0.0046
306
307 Epoch 00075: ReduceLROnPlateau reducing learning rate to 1.0000000475e-05.
308 epoch_end_callback epoch 74 lr 0.000100000005
309 Epoch 76/1000
310   - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
311 epoch_end_callback epoch 75 lr 1.0000001e-05
312 Epoch 77/1000
313   - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
314 epoch_end_callback epoch 76 lr 1.0000001e-05
315 Epoch 78/1000
316   - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
317 epoch_end_callback epoch 77 lr 1.0000001e-05
318 Epoch 79/1000
319   - 1s - loss: 0.0041 - mean_squared_error: 0.0041 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
320 epoch_end_callback epoch 78 lr 1.0000001e-05
321 Epoch 80/1000
322   - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
323
324 Epoch 00080: saving model to model/model_best.h5
325 epoch_end_callback epoch 79 lr 1.0000001e-05
326 Epoch 81/1000
327   - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
328 epoch_end_callback epoch 80 lr 1.0000001e-05
329 Epoch 82/1000
330   - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
331 epoch_end_callback epoch 81 lr 1.0000001e-05
332 Epoch 83/1000
333   - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
334 epoch_end_callback epoch 82 lr 1.0000001e-05
335 Epoch 84/1000
336   - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
337 epoch_end_callback epoch 83 lr 1.0000001e-05
338 Epoch 85/1000
339   - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
340
341 Epoch 00085: ReduceLROnPlateau reducing learning rate to 1.00000006569e-06.
342 epoch_end_callback epoch 84 lr 1.0000001e-05
343 Epoch 86/1000
344   - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
345 epoch_end_callback epoch 85 lr 1.0000001e-06
346 Epoch 87/1000
347   - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
348 epoch_end_callback epoch 86 lr 1.0000001e-06
349 Epoch 88/1000
350   - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
351 epoch_end_callback epoch 87 lr 1.0000001e-06
352 Epoch 89/1000
353   - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
354 epoch_end_callback epoch 88 lr 1.0000001e-06
355 Epoch 90/1000
356   - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
357
358 Epoch 00090: saving model to model/model_best.h5
359 epoch_end_callback epoch 89 lr 1.0000001e-06
360 Epoch 91/1000
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361 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
362 epoch_end_callback epoch 90 lr 1.0000001e-06
363 Epoch 92/1000
364 - 1s - loss: 0.0050 - mean_squared_error: 0.0050 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
365 epoch_end_callback epoch 91 lr 1.0000001e-06
366 Epoch 93/1000
367 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
368 epoch_end_callback epoch 92 lr 1.0000001e-06
369 Epoch 94/1000
370 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
371 epoch_end_callback epoch 93 lr 1.0000001e-06
372 Epoch 95/1000
373 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
374
375 Epoch 00095: ReduceLROnPlateau reducing learning rate to 1e-06.
376 epoch_end_callback epoch 94 lr 1.0000001e-06
377 Epoch 96/1000
378 - 1s - loss: 0.0051 - mean_squared_error: 0.0051 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
379 epoch_end_callback epoch 95 lr 1e-06
380 Epoch 97/1000
381 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
382 epoch_end_callback epoch 96 lr 1e-06
383 Epoch 98/1000
384 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
385 epoch_end_callback epoch 97 lr 1e-06
386 Epoch 99/1000
387 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
388 epoch_end_callback epoch 98 lr 1e-06
389 Epoch 100/1000
390 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
391
392 Epoch 00100: saving model to model/model_best.h5
393 epoch_end_callback epoch 99 lr 1e-06
394 Epoch 101/1000
395 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
396 epoch_end_callback epoch 100 lr 1e-06
397 Epoch 102/1000
398 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
399 epoch_end_callback epoch 101 lr 1e-06
400 Epoch 103/1000
401 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
402 epoch_end_callback epoch 102 lr 1e-06
403 Epoch 104/1000
404 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
405 epoch_end_callback epoch 103 lr 1e-06
406 Epoch 105/1000
407 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
408 epoch_end_callback epoch 104 lr 1e-06
409 Epoch 106/1000
410 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
411 epoch_end_callback epoch 105 lr 1e-06
412 Epoch 107/1000
413 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
414 epoch_end_callback epoch 106 lr 1e-06
415 Epoch 108/1000
416 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
417 epoch_end_callback epoch 107 lr 1e-06
418 Epoch 109/1000
419 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
420 epoch_end_callback epoch 108 lr 1e-06
421 Epoch 110/1000
```

File - run

```
422 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
423
424 Epoch 00110: saving model to model/model_best.h5
425 epoch_end_callback epoch 109 lr 1e-06
426 Epoch 111/1000
427 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
428 epoch_end_callback epoch 110 lr 1e-06
429 Epoch 112/1000
430 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
431 epoch_end_callback epoch 111 lr 1e-06
432 Epoch 113/1000
433 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
434 epoch_end_callback epoch 112 lr 1e-06
435 Epoch 114/1000
436 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
437 epoch_end_callback epoch 113 lr 1e-06
438 Epoch 115/1000
439 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
440 epoch_end_callback epoch 114 lr 1e-06
441 Epoch 116/1000
442 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
443 epoch_end_callback epoch 115 lr 1e-06
444 Epoch 117/1000
445 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
446 epoch_end_callback epoch 116 lr 1e-06
447 Epoch 118/1000
448 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
449 epoch_end_callback epoch 117 lr 1e-06
450 Epoch 119/1000
451 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
452 epoch_end_callback epoch 118 lr 1e-06
453 Epoch 120/1000
454 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
455
456 Epoch 00120: saving model to model/model_best.h5
457 epoch_end_callback epoch 119 lr 1e-06
458 Epoch 121/1000
459 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
460 epoch_end_callback epoch 120 lr 1e-06
461 Epoch 122/1000
462 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
463 epoch_end_callback epoch 121 lr 1e-06
464 Epoch 123/1000
465 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
466 epoch_end_callback epoch 122 lr 1e-06
467 Epoch 124/1000
468 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
469 epoch_end_callback epoch 123 lr 1e-06
470 Epoch 125/1000
471 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
472 epoch_end_callback epoch 124 lr 1e-06
473 Epoch 126/1000
474 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
475 epoch_end_callback epoch 125 lr 1e-06
476 Epoch 127/1000
477 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
478 epoch_end_callback epoch 126 lr 1e-06
479 Epoch 128/1000
480 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
481 epoch_end_callback epoch 127 lr 1e-06
482 Epoch 129/1000
```



File - run

```
483 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
484 epoch_end_callback epoch 128 lr 1e-06
485 Epoch 130/1000
486 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
487
488 Epoch 00130: saving model to model/model_best.h5
489 epoch_end_callback epoch 129 lr 1e-06
490 Epoch 131/1000
491 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
492 epoch_end_callback epoch 130 lr 1e-06
493 Epoch 132/1000
494 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
495 epoch_end_callback epoch 131 lr 1e-06
496 Epoch 133/1000
497 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
498 epoch_end_callback epoch 132 lr 1e-06
499 Epoch 134/1000
500 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
501 epoch_end_callback epoch 133 lr 1e-06
502 Epoch 135/1000
503 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
504 epoch_end_callback epoch 134 lr 1e-06
505 Epoch 136/1000
506 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
507 epoch_end_callback epoch 135 lr 1e-06
508 Epoch 137/1000
509 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
510 epoch_end_callback epoch 136 lr 1e-06
511 Epoch 138/1000
512 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
513 epoch_end_callback epoch 137 lr 1e-06
514 Epoch 139/1000
515 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
516 epoch_end_callback epoch 138 lr 1e-06
517 Epoch 140/1000
518 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
519
520 Epoch 00140: saving model to model/model_best.h5
521 epoch_end_callback epoch 139 lr 1e-06
522 Epoch 141/1000
523 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
524 epoch_end_callback epoch 140 lr 1e-06
525 Epoch 142/1000
526 - 1s - loss: 0.0049 - mean_squared_error: 0.0049 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
527 epoch_end_callback epoch 141 lr 1e-06
528 Epoch 143/1000
529 - 1s - loss: 0.0043 - mean_squared_error: 0.0043 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
530 epoch_end_callback epoch 142 lr 1e-06
531 Epoch 144/1000
532 - 1s - loss: 0.0052 - mean_squared_error: 0.0052 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
533 epoch_end_callback epoch 143 lr 1e-06
534 Epoch 145/1000
535 - 1s - loss: 0.0046 - mean_squared_error: 0.0046 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
536 epoch_end_callback epoch 144 lr 1e-06
537 Epoch 146/1000
538 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
539 epoch_end_callback epoch 145 lr 1e-06
540 Epoch 147/1000
541 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
542 epoch_end_callback epoch 146 lr 1e-06
543 Epoch 148/1000
```

File - run

```
544 - 1s - loss: 0.0047 - mean_squared_error: 0.0047 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
545 epoch_end_callback epoch 147 lr 1e-06
546 Epoch 149/1000
547 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
548 epoch_end_callback epoch 148 lr 1e-06
549 Epoch 150/1000
550 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
551
552 Epoch 00150: saving model to model/model_best.h5
553 epoch_end_callback epoch 149 lr 1e-06
554 Epoch 151/1000
555 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
556 epoch_end_callback epoch 150 lr 1e-06
557 Epoch 152/1000
558 - 1s - loss: 0.0044 - mean_squared_error: 0.0044 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
559 epoch_end_callback epoch 151 lr 1e-06
560 Epoch 153/1000
561 - 1s - loss: 0.0048 - mean_squared_error: 0.0048 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
562 epoch_end_callback epoch 152 lr 1e-06
563 Epoch 154/1000
564 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
565 epoch_end_callback epoch 153 lr 1e-06
566 Epoch 155/1000
567 - 1s - loss: 0.0045 - mean_squared_error: 0.0045 - val_loss: 0.0047 - val_mean_squared_error: 0.0047
568 epoch_end_callback epoch 154 lr 1e-06
569 Epoch 00155: early stopping
570 #####show result#####
571 history.png has been saved!
572 #####model evaluate#####
573 load the trained model
574 results test_loss: 0.004696193151175976
575 results test_mean_squared_error: 0.004696193151175976
576
577 Process finished with exit code 0
578
```