TF 2.0

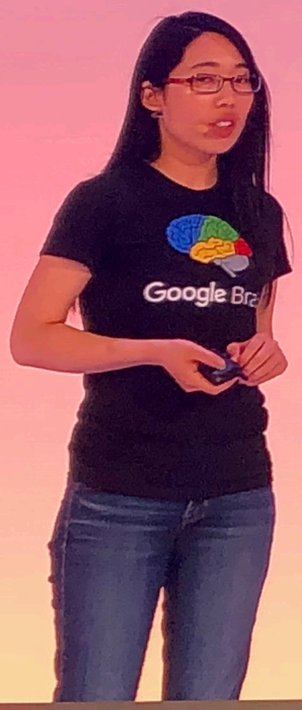
```
model = tf.keras.models.Sequential([
  tf.keras.layers.Flatten(input_shape=(28, 28)),
  tf.keras.layers.Dense(512, activation='relu'),
  tf.keras.layers.Dropout(0.2),
  tf.keras.layers.Dense(10, activation='softmax')
])
model.compile(optimizer='adam',
              loss='sparse_categorical_crossentropy',
              metrics=['accuracy'])

model.fit(x_train, y_train, epochs=5)
model.evaluate(x_test, y_test)
```

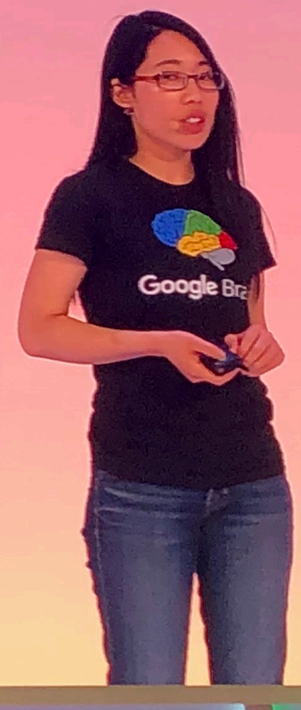
面向专家：自定义模型训练过程

```
model = MyModel()

# 定义 tf.GradientTape 来记录所有ops，用于梯度计算.
with tf.GradientTape() as tape:
  logits = model(images)
  loss_value = loss(logits, labels)

# 使用 tape 计算梯度.
grads = tape.gradient(loss_value, model.trainable_variables)

# 使用优化器进行模型优化.
optimizer.apply_gradients(zip(grads, model.trainable_variables))
```

分布式策略: 使用多个 GPU

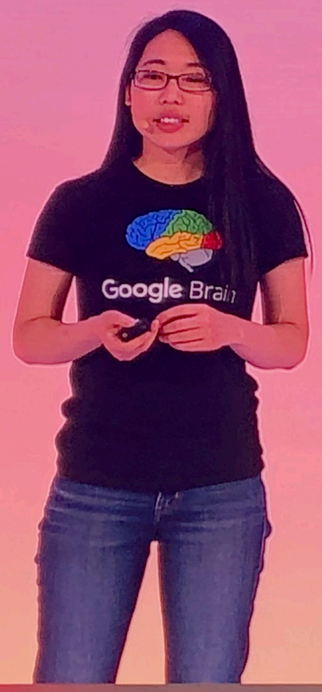
```
strategy = tf.distribute.MirroredStrategy()

with strategy.scope():
  model = tf.keras.models.Sequential([
      tf.keras.layers.Dense(64, input_shape=[10]),
      tf.keras.layers.Dense(64, activation='relu'),
      tf.keras.layers.Dense(10, activation='softmax')])

model.compile(optimizer='adam',
              loss='categorical_crossentropy',
              metrics=['accuracy'])
```

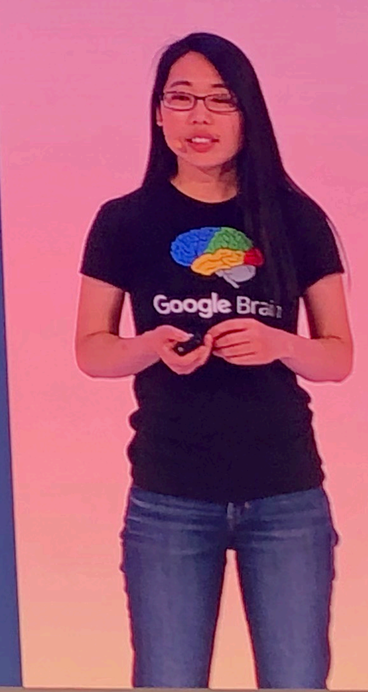


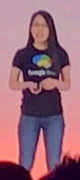


模型保存和恢复

```
model_file = tf.keras.models.save_model(
    model, '/path/to/model')

new_model = tf.keras.models.load_model(model_file)

new_model.summary()
```







TensorBoard SCALARS IMAGES GRAPHS DISTRIBUTIONS HISTOGRAMS

Horizontal axis

STEP RELATIVE WALL

Runs

Write a regex to filter runs

20190223-022505/train

20190223-022505/validation

20190223-022557/data

TOGGLE ALL RUNS

logs/fit

Filter tags (regular expressions supported)

dense_1

dense_1/bias_0 20190223-022505/train

dense_1/kernel_0 20190223

dense

dense/bias_0 20190223-022505/train

dense/kernel_0 20190223

Google Brain

Google Brain

TensorBoard SCALARS IMAGES GRAPHS DISTRIBUTIONS HISTOGRAMS

Histogram mode

OVERLAY OFFSET

Offset time axis

STEP RELATIVE WALL

Runs

Write a regex to filter runs

20190223-022505/train
20190223-022505/validation
20190223-022557/data

TOGGLE ALL RUNS

logs/fit

Filter tags (regular expressions supported)

dense_1

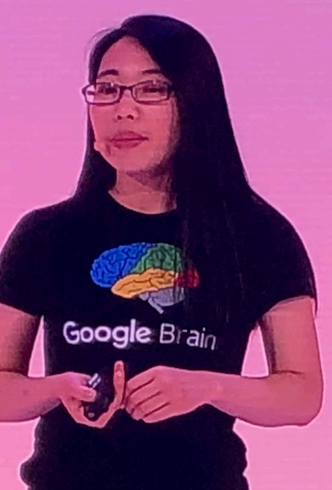
dense_1/bias_0 20190223-022505/train

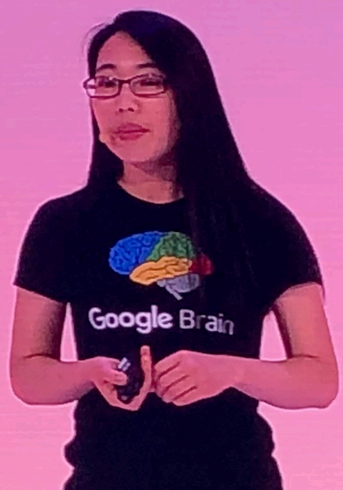
dense_1/kernel_0 20190223-0225

dense

dense/bias_0 20190223-022505/train

dense/kernel_0 20190223-0225





TensorBoard SCALARS IMAGES GRAPHS DISTRIBUTIONS HISTOGRAMS

Histogram mode

OVERLAY OFFSET

Offset time axis

STEP RELATIVE WALL

Runs

Write a regex to filter runs

- 20190223-022505/train
- 20190223-022505/validation
- 20190223-022557/data

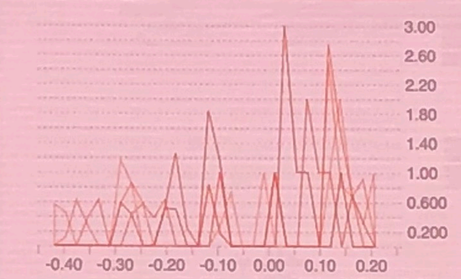
TOGGLE ALL RUNS

logs/fit

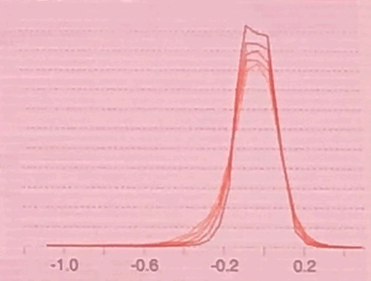
Filter tags (regular expressions supported)

dense_1

dense_1/bias_0 20190223-022505/train

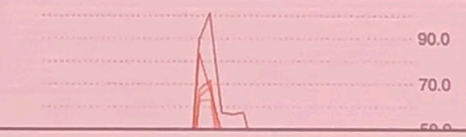


dense_1/kernel_0 20190223-0225

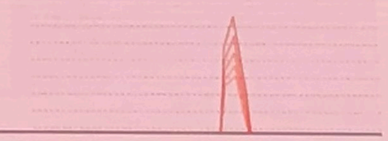


dense

dense/bias_0 20190223-022505/train



dense/kernel_0 20190223-0225



TensorBoard SCALARS IMAGES GRAPHS DISTRIBUTIONS HISTOGRAMS

Show data download links

Ignore outliers in chart scaling

Tooltip sorting method: default

Smoothing

0.6

Horizontal Axis

STEP RELATIVE WALL

Runs

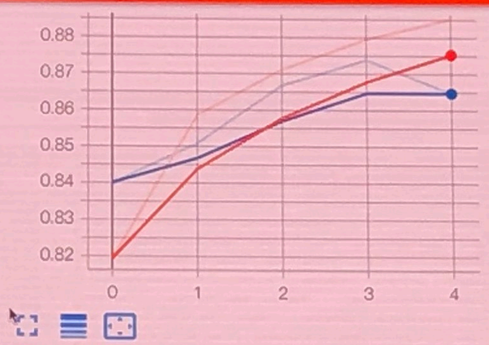
Write a regex to filter runs

20190223-022505/train

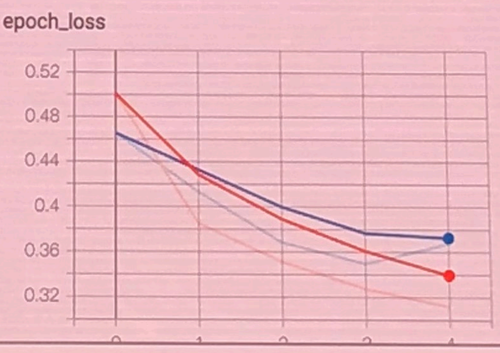
20190223-022505/validation

TOGGLE ALL RUNS

logs/fit



epoch_loss



TensorBoard SCALARS IMAGES GRAPHS DISTRIBUTIONS HISTOGRAMS

Show actual image size

Filter tags (regular expressions supported)

Brightness adjustment

RESET

Contrast adjustment

RESET

Runs

Write a regex to filter runs

- 20190223-022505/train
- 20190223-022505/validation
- 20190223-022557/data

TOGGLE ALL RUNS

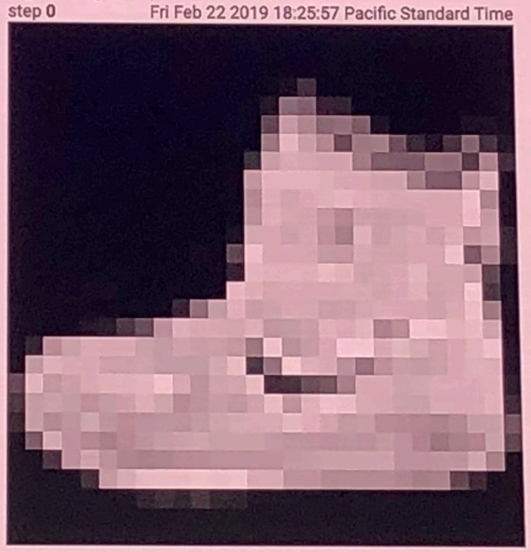
logs/fit

Training example 0: Ankle boot

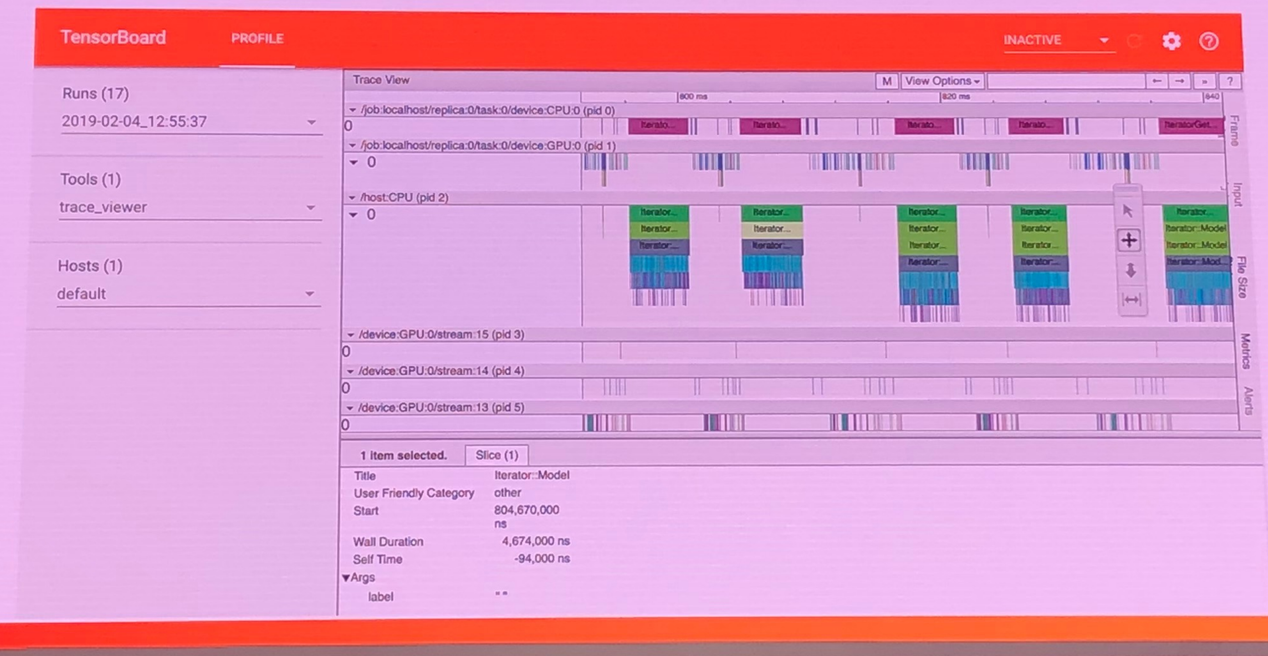
Training example 0: Ankle boot 20190223-022557/data

tag: Training example 0: Ankle boot

step 0 Fri Feb 22 2019 18:25:57 Pacific Standard Time



模型性能分析


TensorBoard
PROFILE
INACTIVE
Runs (17)
2019-02-04_12:55:37
Tools (1)
trace_viewer
Hosts (1)
default
Trace View
M
View Options
800 ms
820 ms
840
/job:localhost/replica:0/task:0/device:CPU:0 (pid 0)
/job:localhost/replica:0/task:0/device:GPU:0 (pid 1)
/host:CPU (pid 2)
/device:GPU:0/stream:15 (pid 3)
/device:GPU:0/stream:14 (pid 4)
/device:GPU:0/stream:13 (pid 5)
Frame
Input
File Size
Metrics
Alerts
1 item selected.
Slice (1)
Title
Iterator::Model
User Friendly Category
other
Start
804,670,000 ns
Wall Duration
4,674,000 ns
Self Time
-94,000 ns
Args
label