Experts

Weights and Biases for better machine learning

Make the best outta your ML models

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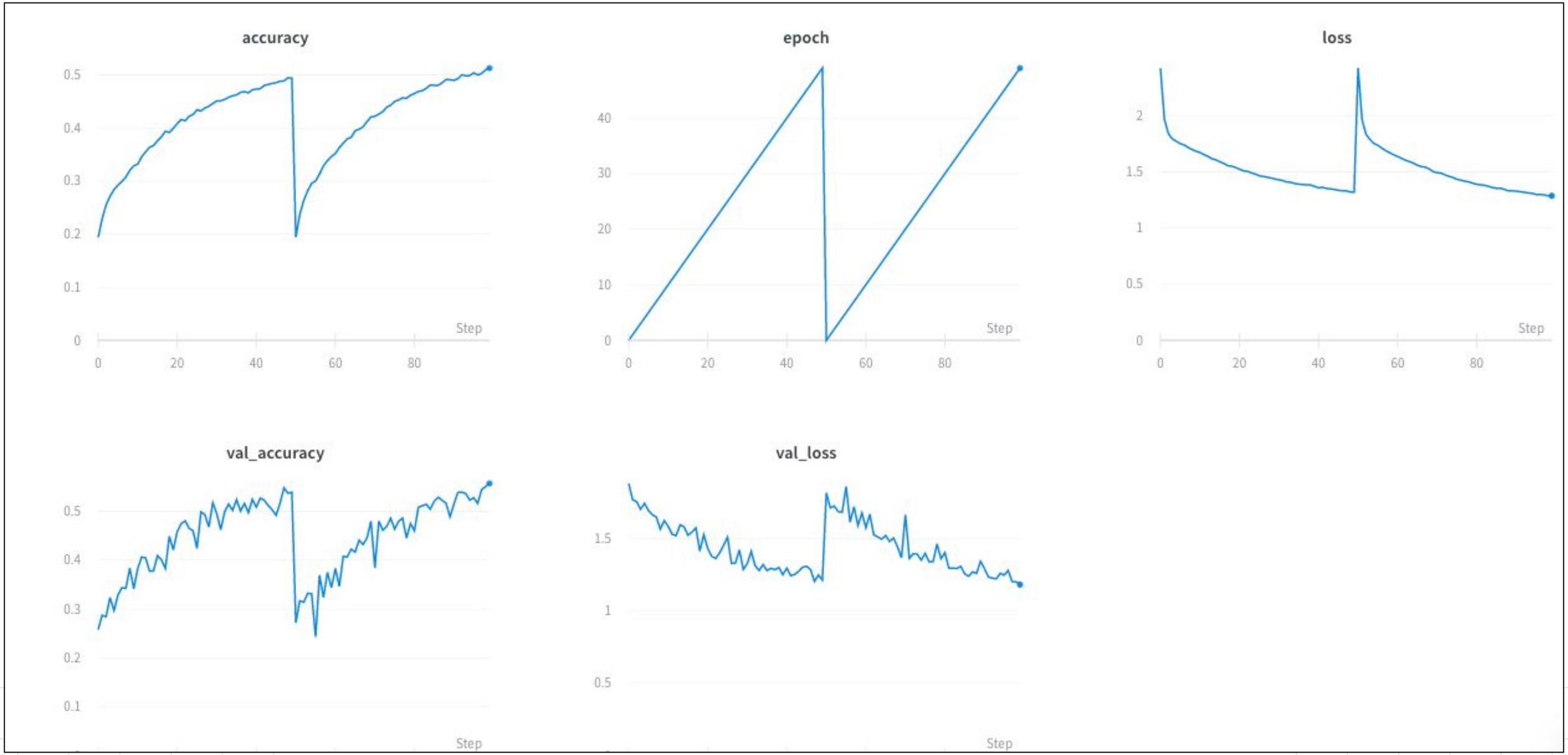
Machine learning involves rapid experimentation

- Lots of experiments, some of them are good, not all of them

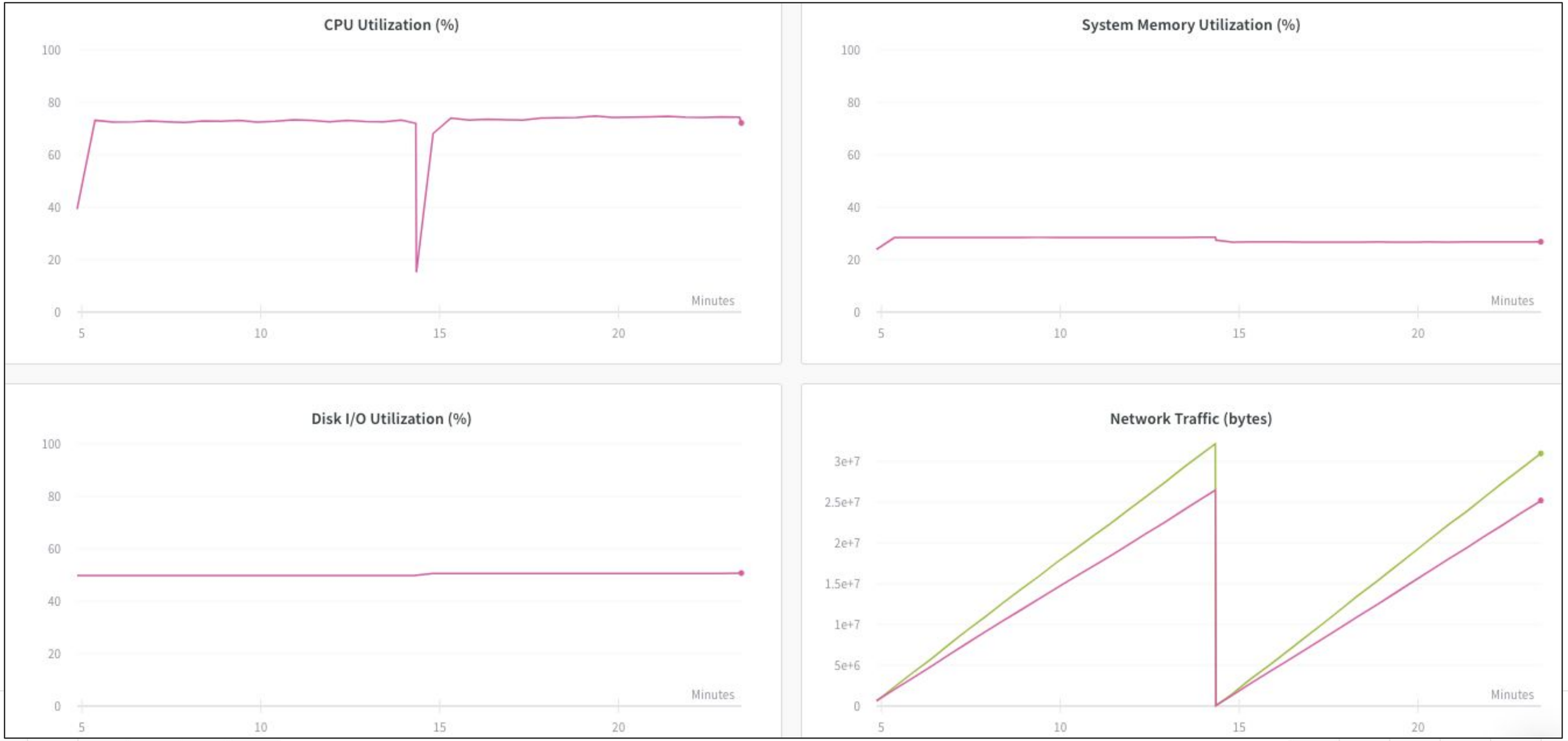
Machine learning involves rapid experimentation

- Same boilerplate code to
  - Generate plots (TensorBoard but customization is a bit more involved)


accuracy
0.5
0.4
0.3
0.2
0.1
0
Step
0
20
40
60
80
epoch
40
30
20
10
0
Step
0
20
40
60
80
loss
2
1.5
1
0.5
0
Step
0
20
40
60
80
val_accuracy
0.5
0.4
0.3
0.2
0.1
Step
val_loss
1.5
1
0.5
Step

Machine learning involves rapid experimentation

- Same boilerplate code to
  - Monitor system metrics like CPU & GPU usage, memory footprint, and so on


CPU Utilization (%)
100
80
60
40
20
0
Minutes
5
10
15
20
System Memory Utilization (%)
100
80
60
40
20
0
Minutes
5
10
15
20
Disk I/O Utilization (%)
100
80
60
40
20
0
Minutes
5
10
15
20
Network Traffic (bytes)
3e+7
2.5e+7
2e+7
1.5e+7
1e+7
5e+6
0
Minutes
5
10
15
20

Machine learning involves rapid experimentation

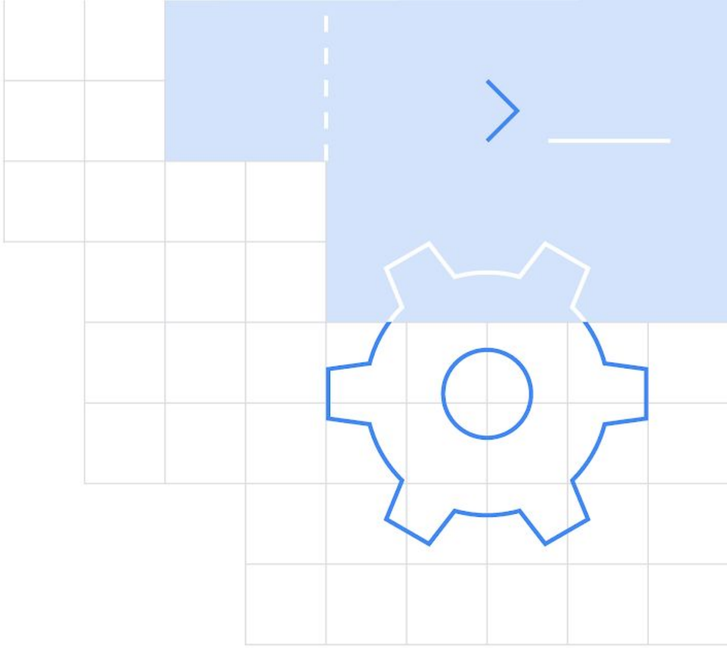
- Same boilerplate code to
  - Save the best model weights

Machine learning involves rapid experimentation

- Same boilerplate code to
  - Save the best model weights
  - Analyze the prediction dynamics of a model
  -

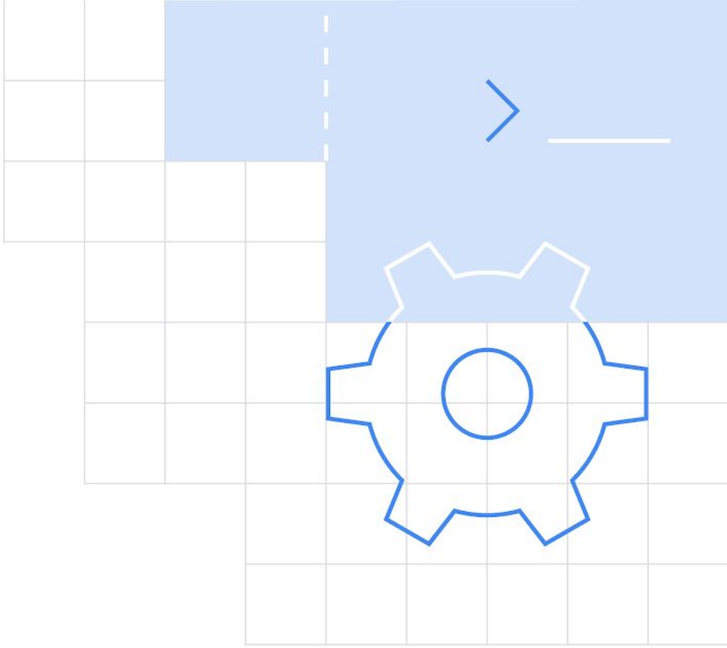

Happy
Neutral
Happy
Neutral
Fear

What if all of these could be done by ...



Experts


model.fit(X_train, y_train,
validation_data=(...),
epochs=...,
callbacks=[WandbCallback(validation_data=(...),
data_type="image", labels=...)]
)



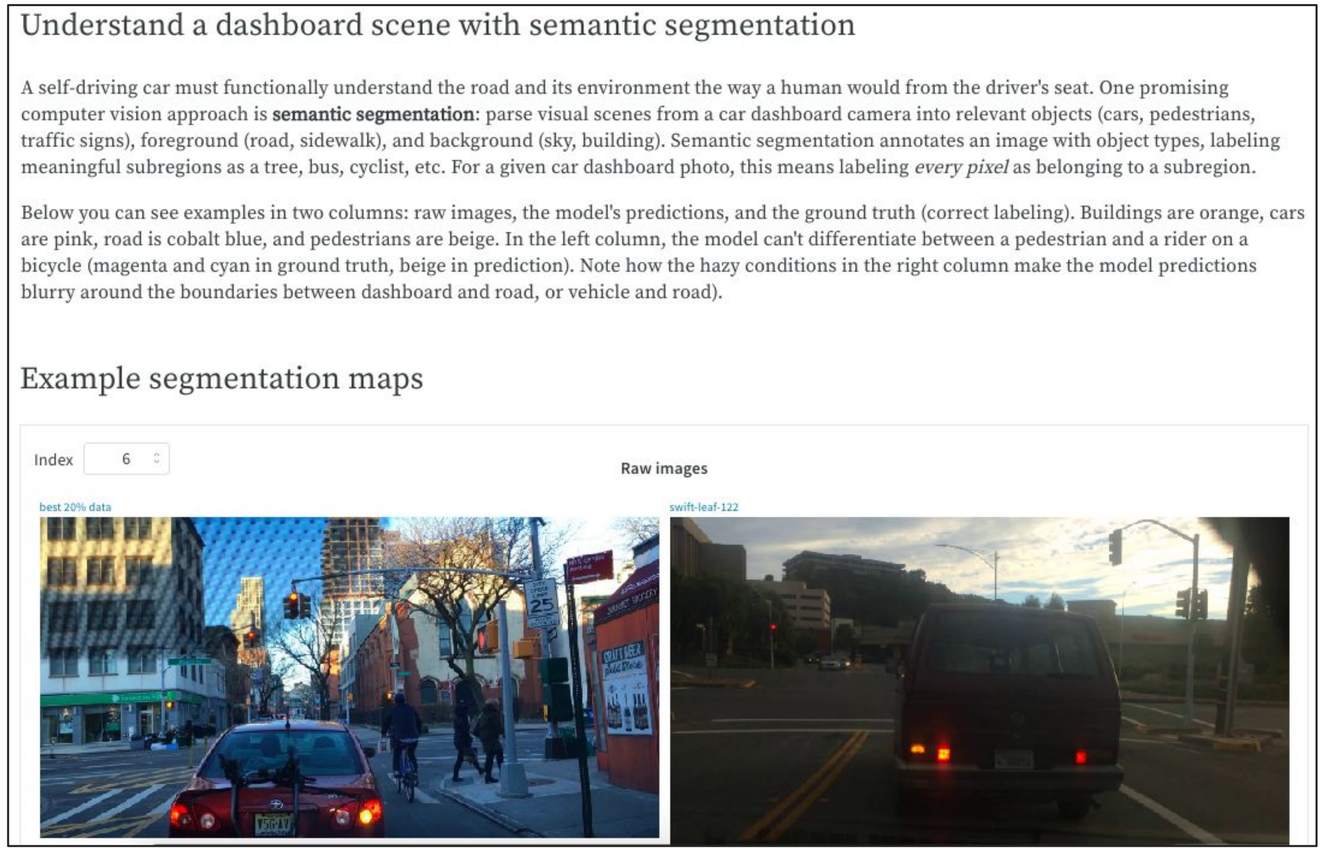
And ***done!***

http://bit.ly/wandb_demo

Experts

But that’s not all!

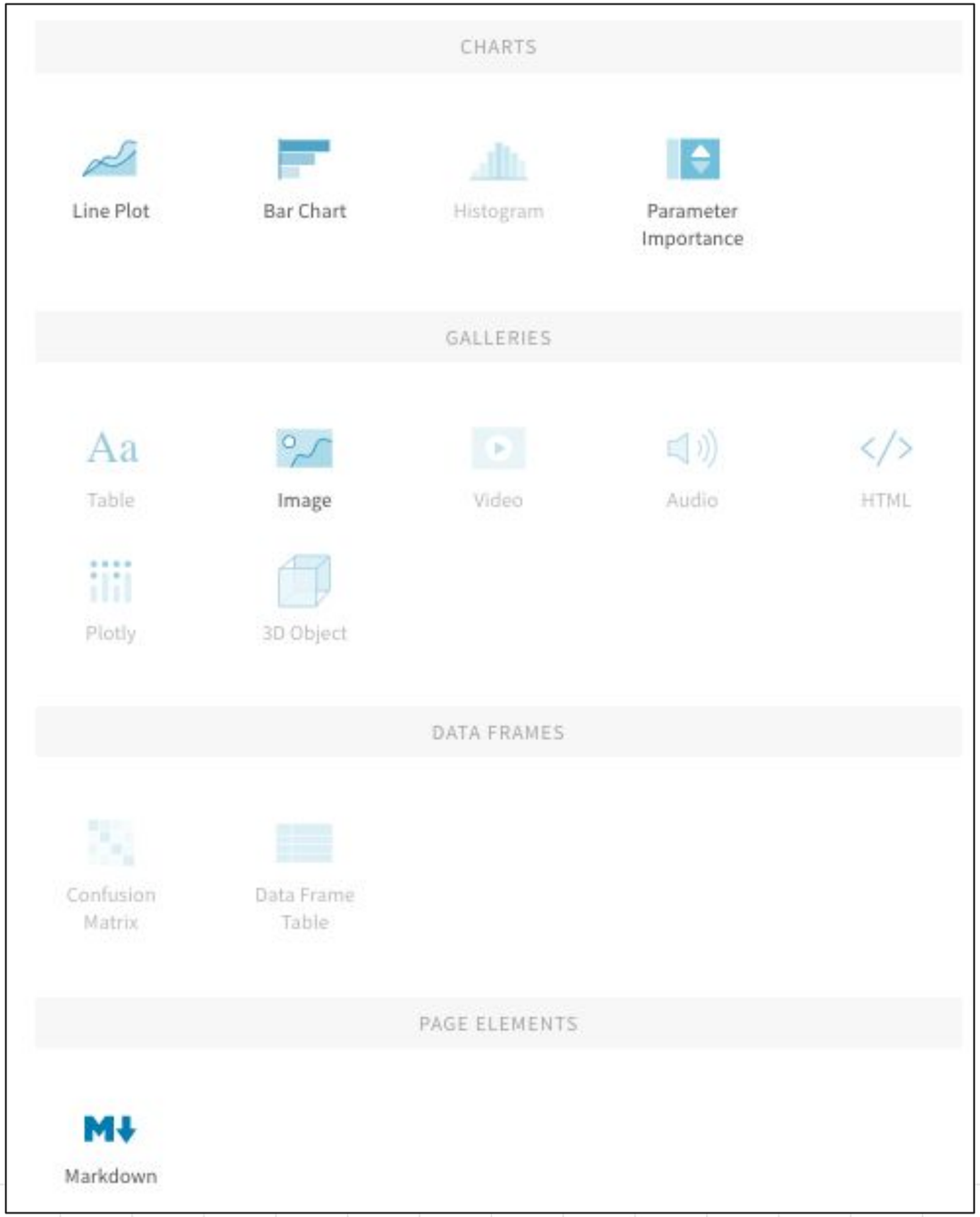
- Create astounding reports!



http://bit.ly/self-driving-wandb

But that’s not all!

- Customize the data generated by Weights and Biases.


CHARTS
Line Plot
Bar Chart
Histogram
Parameter Importance
GALLERIES
Table
Image
Video
Audio
HTML
Plotly
3D Object
DATA FRAMES
Confusion Matrix
Data Frame Table
PAGE ELEMENTS
Markdown

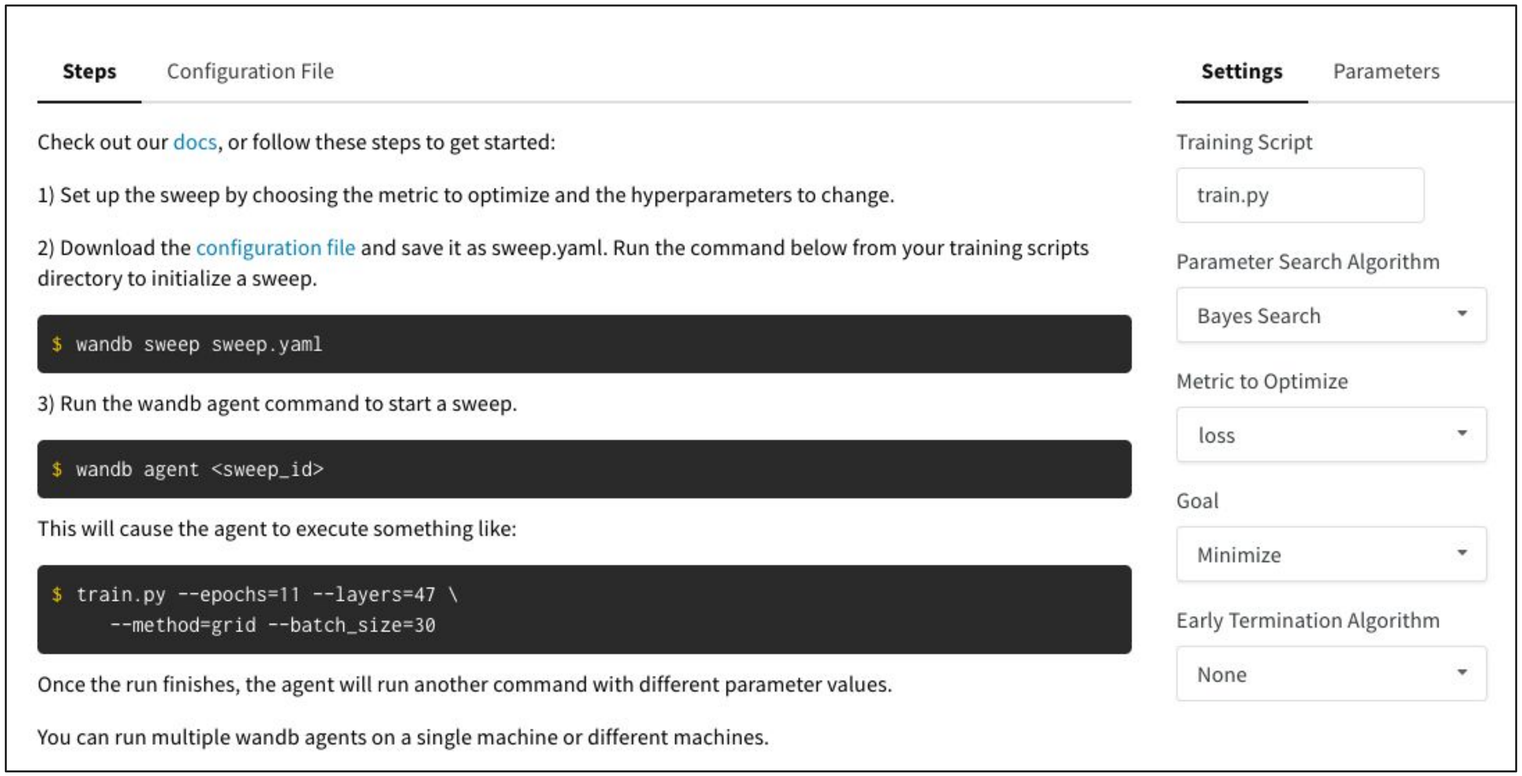
But that's not all!

- Get a tabular summary of your experiments.

Name (10 visualized)	State	Notes	User	Tags	Created	Runtime	Sweep	accuracy	epoch	loss	val_accu…	val_loss
mini-vgg-wo-data-aug-sgd-lsuv	finished	Add notes	saya…		6d ago	3m 10s	-	0.607	49	1.044	0.4497	1.553
mini-vgg-prog-channels-wda-lsuv	finished	Add notes	saya…		6d ago	2m 31s	-	0.5504	49	1.181	0.4351	1.532
mini-vgg-prog-channels-wo_da	finished	Add notes	saya…		6d ago	2m 23s	-	0.5016	49	1.291	0.4407	1.488
mini-vgg-prog-channels-2	finished	Add notes	saya…		6d ago	7m 52s	-	0.3934	49	1.552	0.4007	1.556
mini-vgg-prog-channels	finished	Add notes	saya…		6d ago	2m 53s	-	0.3283	17	1.67	0.3362	1.683
mini-vgg-net-daug-sgd-clr	finished	Add notes	saya…		6d ago	6m 38s	-	0.3129	37	1.791	0.3566	1.655
mini-vgg-net-da-sgd	finished	Add notes	saya…		6d ago	9m 7s	-	0.5129	49	1.287	0.5572	1.183
mini-vgg-net	finished	Add notes	saya…		6d ago	1m 26s	-	0.7534	10	0.6755	0.5493	1.479
miniinception-net	finished	Add notes	saya…		6d ago	8m 45s	-	0.8818	12	0.3208	0.501	1.79

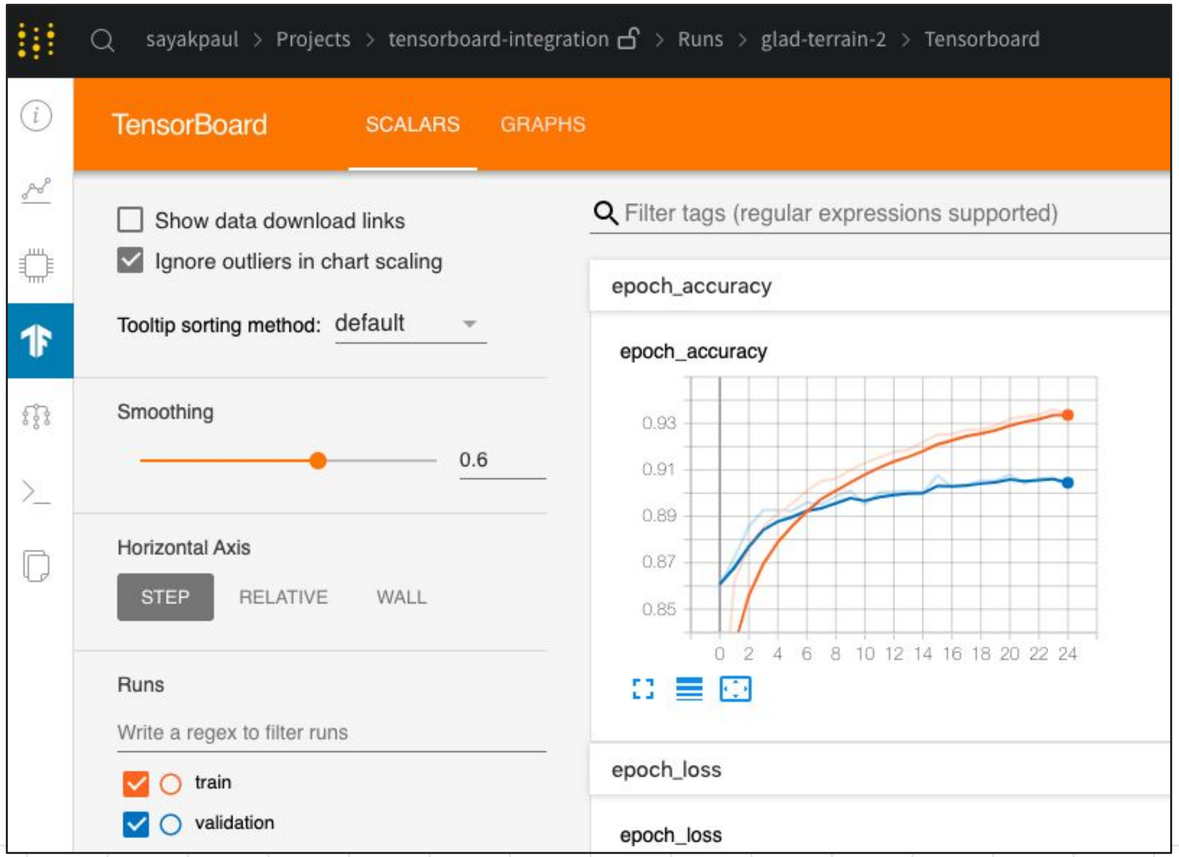
But that's not all!

- Seamless hyperparameter tuning!



But that’s not all!

- Get your TensorBoard hosted automatically.



But that’s not all!

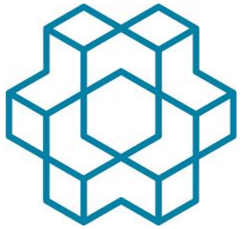
- Prediction dynamics for different input modalities.

text

Step 18

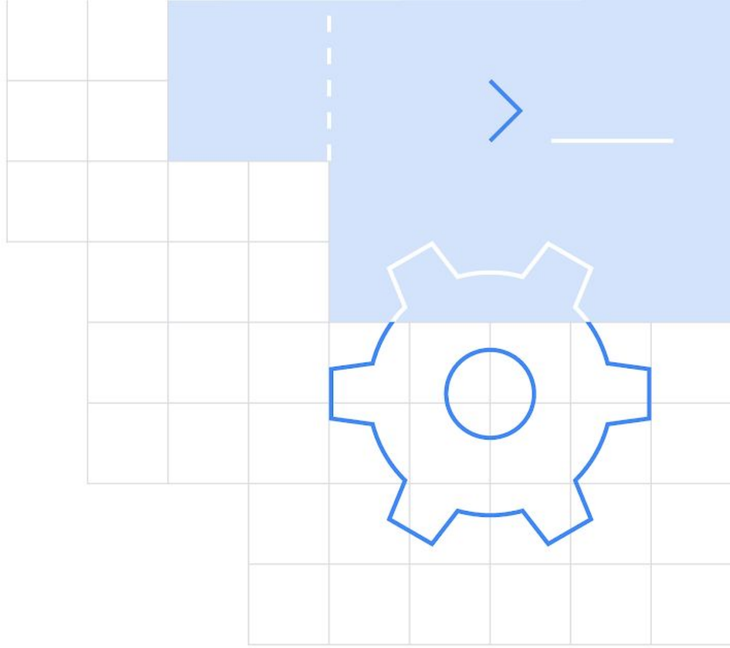
Text ▲	Predicted Label	True Label
"BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding"	["cs.CL: 99.21%","cs.LG: 21.01%"]	"cs.CL"
"MultiFiT: Efficient Multi-lingual Language Model Fine-tuning"	["cs.CL: 99.84%","cs.LG: 4.30%"]	"cs.CL, cs.LG"
"On the Variance of the Adaptive Learning Rate and Beyond"	["cs.LG: 91.80%","stat.ML: 88.42%"]	"cs.LG, stat.ML"

Works with all of these



It’s not framework-limited

- **Mask R-CNN** semantic segmentation
- Visualizing 3D Bounding Boxes



Get started!

- `pip install wandb`
- https://www.wandb.com/articles

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