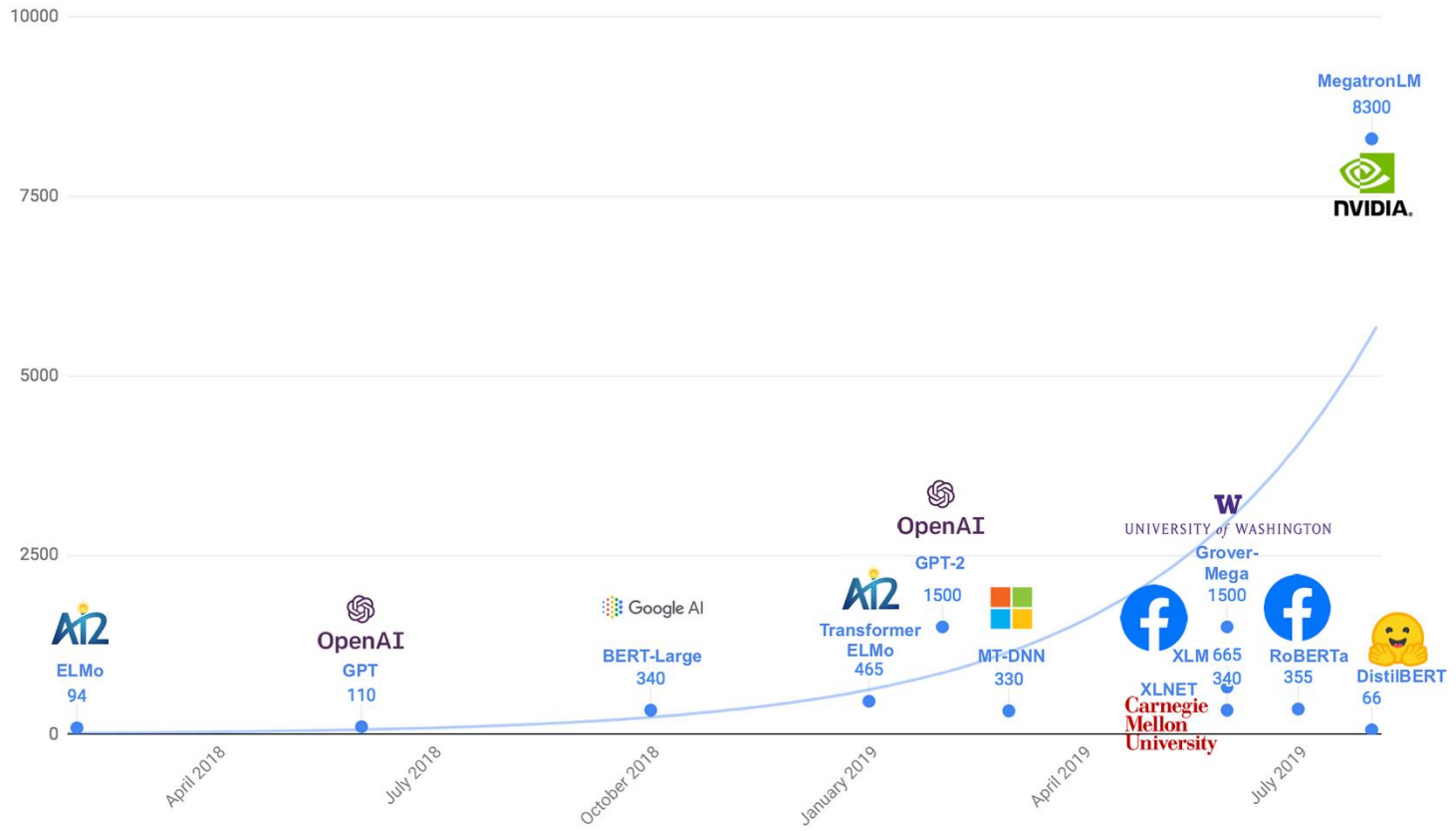
Part 3: Fine-Tuning a Language Model

SUMMER 2025 STARTER-AI HANDS-ON WORKSHOP SERIES

The University of Texas Rio Grande Valley



By the way… Google's GLaM model reportedly has 1.2T parameters

Fine-Tuning

Fine-tuning involves taking a pretrained model and training it for a specialized task

- Many language models are pretrained on massive amounts of text data
- Imagine them as being very good at English – now they just need to learn a specific task

Here, we will use a relatively small language model, DistilBERT (2019)

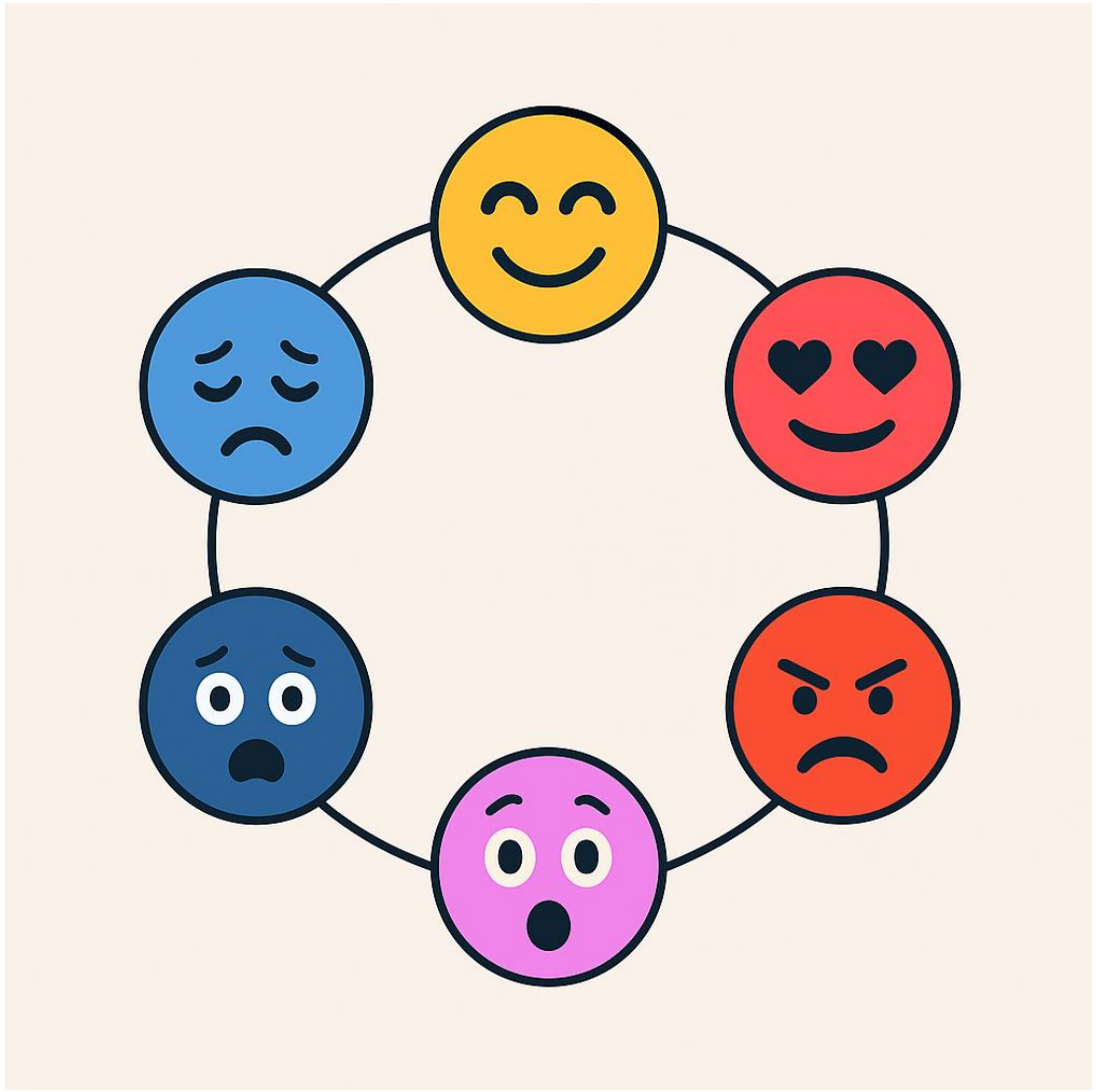
- It is "distilled" from a large model (BERT)
- *only* 66 million parameters

DistilBERT details

Workflow (Simple!)

1. Tokenize Dataset
2. Load the pretrained model with new layer for classification
3. Train on new data
4. Evaluate!

Hugging Face will provide the pretrained model and give us a Trainer class that will help make training more streamlined



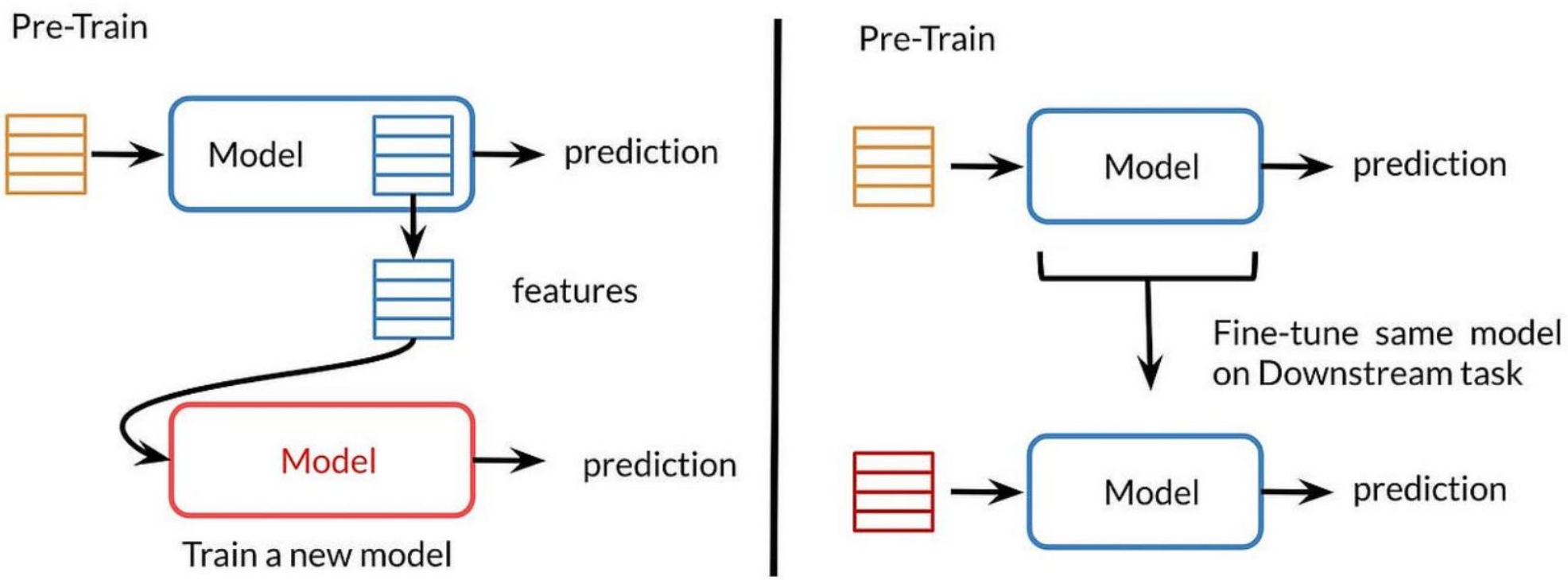
Capstone

After you complete Notebook 3a, continue on to Notebook 3b, which contains some challenges and expands our task to classifying the emotional content of statements

Let's Start Training!

IT WILL TAKE SOME TIME, SO WE WILL DISCUSS MORE ONCE THE MODEL STARTS LEARNING...

Fine-Tuning and Transfer Learning



Comparison with zero-shot model classification

Some models are trained using a different strategy – Natural Language Inference, that allows for learning robust relationships between ideas

Instead of asking a model – “is this statement positive or negative?”

We give the model a statement and a hypothesis, and the model then predicts if the hypothesis entails (true), contradicts (false) or is neutral for the statement

Example: ” Does the sentence ‘This place was incredible!’ entail the label ‘positive’? ”

Next Steps

Fine-tuning is extremely powerful, and hopefully you see it can be pretty easy.

Find a project you like and try it out! It might just take an afternoon if you have a dataset.

Hugging Face Datasets have a lot of cool options

- Sarcasm, tweets, news, code, all kinds of dialogue, etc.

There are also many more pretrained models you can try with Hugging Face Models

- Image processing
- Generative models of all flavors
- Multimodal models

You can pretty easily use the workflow we have here to extend into your next project with the *Trainer* object and dataloaders we have explored.

Thank you!

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