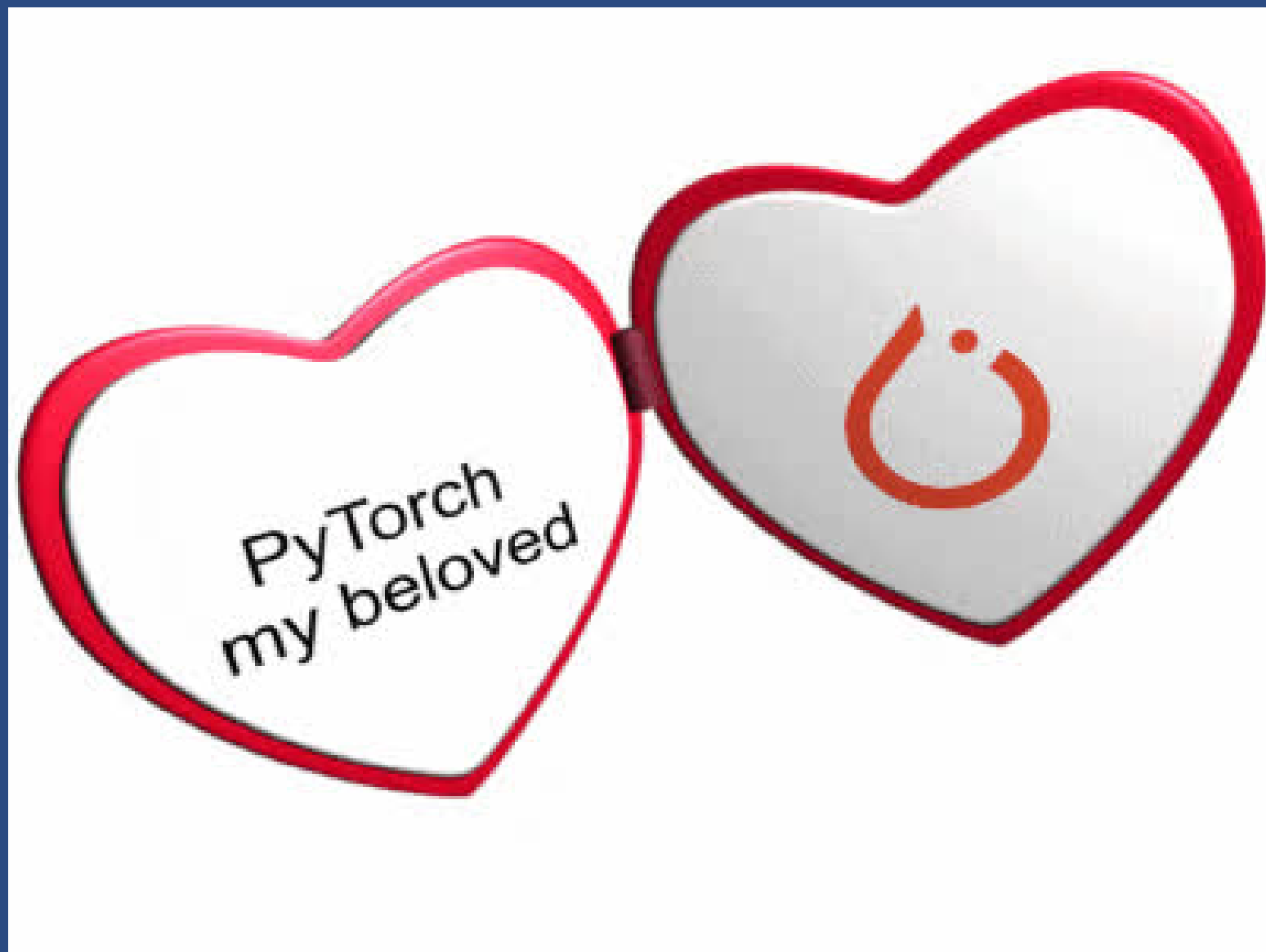




Open-source AI

Le Tuan Huy Nguyen



Libraries

Deep Learning Libraries

- PyTorch
- TensorFlow
- Keras

Other useful libraries

- Data processing: Pandas
- Plotting: matplotlib, seaborn

```
[1]: from fastai.vision.all import *
from PIL import Image

[ ]: path = untar_data(URLs.PETS)

[3]: files = get_image_files(path/"images")

[4]: def label_func(f): return f[0].isupper()

[5]: dls = ImageDataLoaders.from_name_func(path, files, label_func, item_tfms=Resize(224))

[16]: learn = vision_learner(dls, resnet18, metrics=error_rate)
learn.fine_tune(1)
```

epoch	train_loss	valid_loss	error_rate	time
0	0.182789	0.046575	0.012855	00:09

epoch	train_loss	valid_loss	error_rate	time
0	0.042533	0.027908	0.009472	00:11

```
[17]: dog_img = Image.open('ressources/dog.jpg')
dog_img
```

```
[17]:
```



```
[26]: preds, choice, chances = learn.predict(dog_img.copy())
print(f"Is this a cat? {preds}")
print(f"Probability that it is a dog: {chances[choice] * 100} %")
```

```
Is this a cat? False
Probability that it is a dog: 99.99971008300781 %
```



Open-source Datasets

Publicly available datasets can be found on:

- Kaggle
- Huggingface

kaggle



Hugging Face



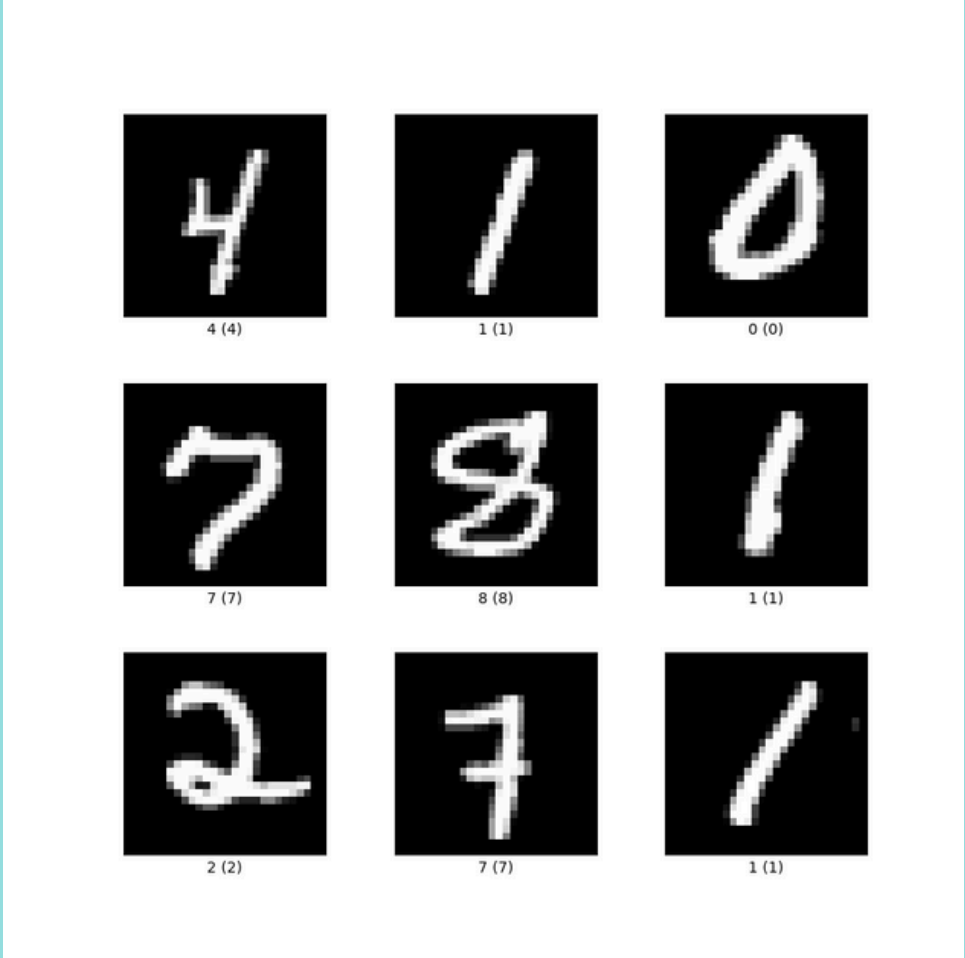


Image classification

ham	Goodo! Yes we must speak friday - egg-potato ratio for tortilla needed!
ham	Hmm...my uncle just informed me that he's paying the school directly. So pls buy food.
spam	PRIVATE! Your 2004 Account Statement for 07742676969 shows 786 unredeemed Bonus Points. To claim cal...
spam	URGENT! Your Mobile No. was awarded £2000 Bonus Caller Prize on 5/9/03 This is our final try to cont...

Natural Language Processing

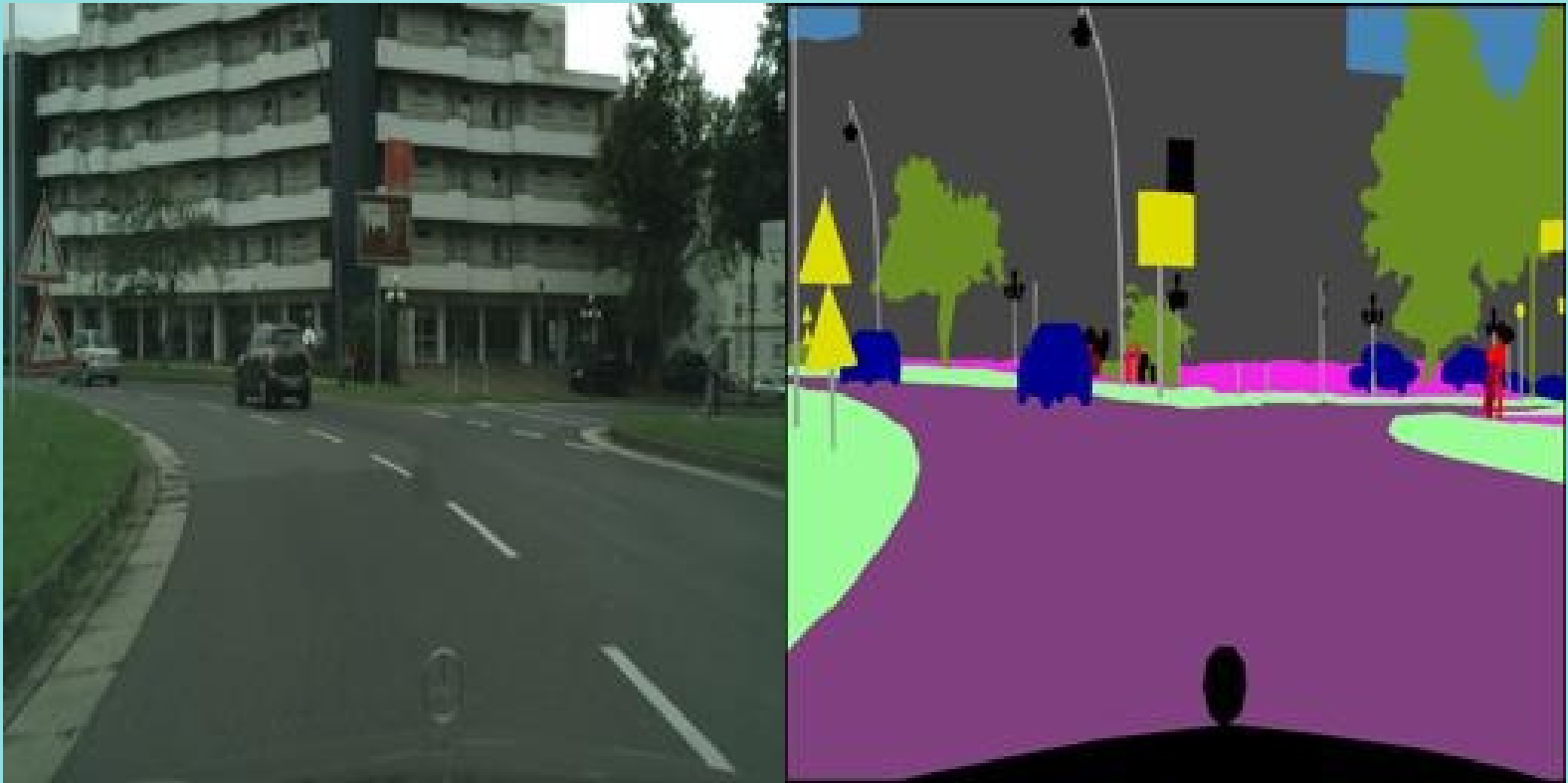


Image segmentation

```
[3]: from datasets import load_dataset
```

```
[ ]: dsd = load_dataset('ylecun/mnist')
```

```
[9]: dsd['train']['image'][0]
```

```
[9]: 
```

```
[10]: dsd['train']['label'][0]
```

```
[10]: 5
```



Hugging Face

Open Source Models



Image Generation:

Stability AI's Stable Diffusion

Large Language Models:

Meta's LLaMA

Speech To Text:

OpenAI's Whisper



Stable Diffusion

LLaMA
by  **Meta**



Whisper


```
[ ]: from diffusers import DiffusionPipeline

pipe = DiffusionPipeline.from_pretrained("stable-diffusion-v1-5/stable-diffusion-v1-5")
pipe = pipe.to('cuda')

prompt = "Horse on a skateboard, high quality 8k"
image = pipe(prompt).images[0]

17]: image.show()
```



```
•[23]: from transformers import pipeline

messages = [
    {"role": "user", "content": "What are you?"},
]
pipe = pipeline("text-generation", model="HuggingFaceTB/SmolLM-360M-Instruct", device="cuda")
ans = pipe(messages)

[28]: print(ans[0]['generated_text'][-1]['content'])

I'm a digital AI assistant, designed to provide information, answer questions, and assist with tasks.
```


**Thanks for
listening!**

