

Intro to deep learning

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Lecture 3: First experience with the Hugging Face



What you will learn in this lecture

- How to use the Hugging Face models library
- How to define specific tasks
- How to do first predictions with pretrained models

Example input

```
text = """Dear Amazon, last week I ordered an Optimus Prime action figure from your online store in Germany. Unfortunately, when I opened the package, I discovered to my horror that I had been sent an action figure of Megatron instead! As a lifelong enemy of the Decepticons, I hope you can understand my dilemma. To resolve the issue, I demand an exchange of Megatron for the Optimus Prime figure I ordered. Enclosed are copies of my records concerning this purchase. I expect to hear from you soon. Sincerely, Bumblebee."""
```

- Does the text have a negative or positive connotation?
- What people/objects are named in the text?
- What are main points of the text?
- What if we need a translation of the text?

Text classification (sentiment analysis)

```
>>> from transformers import pipeline
>>> classifier = pipeline(task="text-classification")
>>> sentiments = classifier(text)
>>> sentiments
[{'label': 'NEGATIVE', 'score': 0.9015460014343262}]
```

- Call a `pipeline` with the task `"text-classification"`
- A task-specific default model is used, but you can define your model!
- The results are a list of predictions with confidence scores.

Named entity recognition (ner)

```
>>> ner_tagger = pipeline(  
... task="ner", aggregation_strategy="simple"  
... )  
>>> entities = ner_tagger(text)  
>>> entities # truncated output  
[{'entity_group': 'ORG',  
  'score': 0.9411546,  
  'word': 'amazon',  
  'start': 5,  
  'end': 11},  
 {'entity_group': 'MISC',  
  'score': 0.9315696,  
  'word': 'optimus prime',  
  'start': 36,  
  'end': 49},]
```

- The task key is `"ner"`
- Additional arguments to define the pipeline
- The output is a list of dictionaries with recognized entities

Question answering

```
>>> reader = pipeline(task="question-answering")
>>> question = "What does the customer want?"
>>> answers = reader(question=question, context=text)
>>> answers
{'score': 0.6312923431396484,
 'start': 335,
 'end': 358,
 'answer': 'an exchange of Megatron'}
```

- The task key is `"question-answering"`
- Define your question(s) as a string (or list of strings)
- Pass your question and the text as a context to the pipeline
- The output is a list of dictionaries with answers to questions

Summarization

```
>>> summarizer = pipeline(task="summarization")
>>> summaries = summarizer(
...     text,
...     max_length=45,
...     min_length=45,
...     clean_up_tokenization_spaces=True
... )
>>> summaries
[{"summary_text": "Amazon's Optimus Prime action figure\ Wassent to a German online store in Germany. Bumblebee\ asks for an exchange of Megatron for the Optimus Prime\ figure he ordered. He expects to hear from you soon."}]
```

- The task key is `"summarization"`
- Summarize the text using additional arguments
- The output is a list of dictionaries with short summaries of the input text

Translation

```
>>> translator = pipeline(task="translation_en_to_de")
>>> translations = translator(
...     text,
...     clean_up_tokenization_spaces=True,
...     min_length=50
... )
>>> translations
[{"translation_text": "Sehr geehrter Amazon,\nletzte Woche habe ich eine Optimus Prime Action\nFigur aus Ihrem Online-Shop in Deutschland bestellt.\nLeider, als ich das Paket öffnete, entdeckte ich zu\meinem Entsetzen, dass ich stattdessen eine Action\nFigur von Megatron geschickt worden war! Als\nlebenslanger Feind der Decepticons, Ich hoffe,\nSie können mein Dilemma verstehen. Um das Problem\nzu lösen, Ich fordere einen Austausch von Megatron\nfür die Optimus Prime Figur habe ich bestellt."}]
```

- The task key is `"translation_xx_to_yy"`
- Translate your text using additional arguments
- The output is a list of dictionaries with the translated text