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Keras Community Day

TensorFlow Vietnam

Speaker

Phạm Đình Khánh

- Founder DataScienceWorld.Kan
- Senior AI consultant, Neurond Technology JSC
- Topic: Compete in Kaggle using KerasNLP

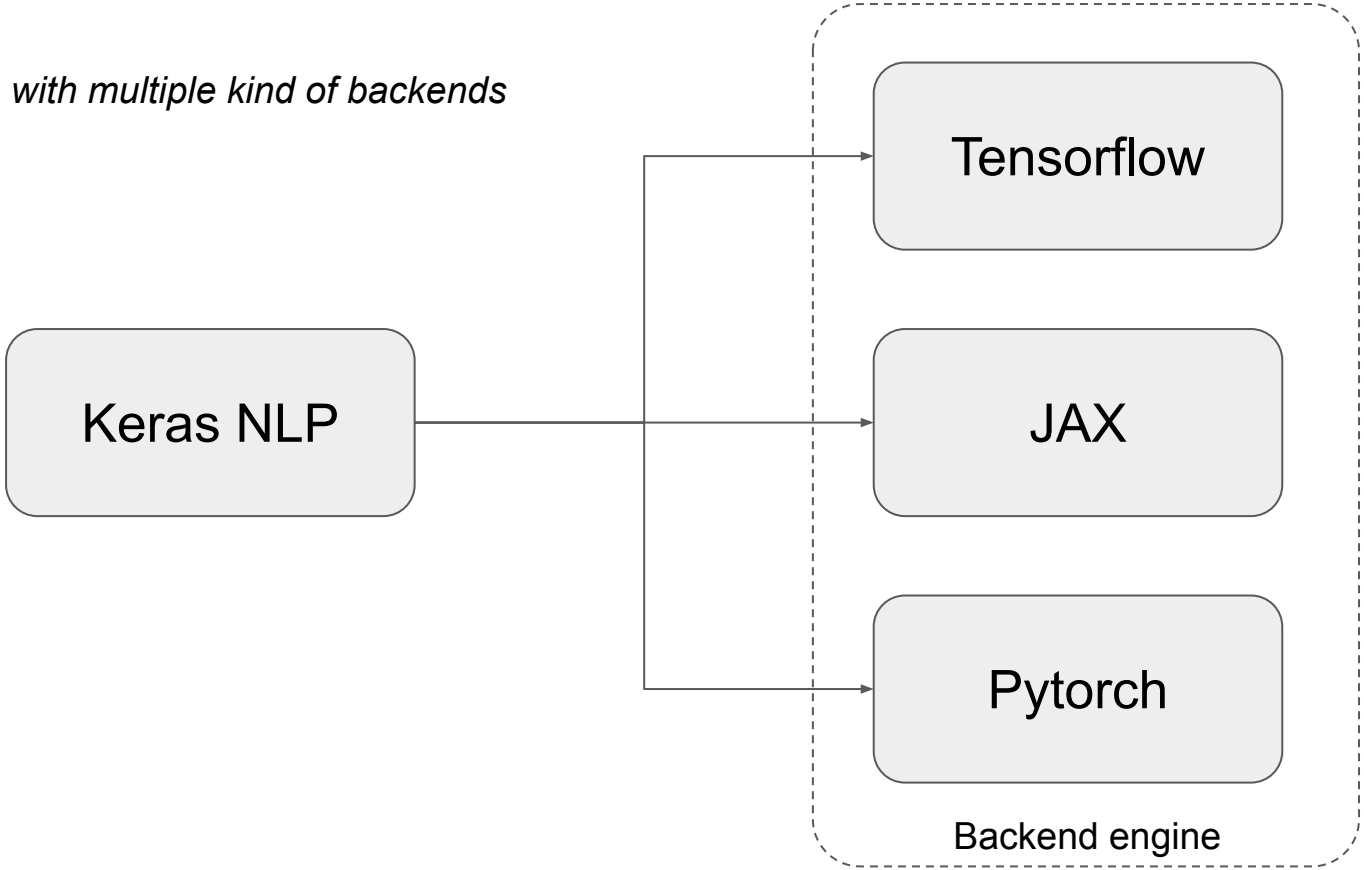
09 09 2023 | 14:30 - 17:30
Trung tâm Đổi mới Sáng tạo Quốc Gia

Agenda

- Introduce Keras NLP
- Why is Keras NLP important?
- Key Features of Keras NLP
- Use Cases
- Components of Keras NLP
- Getting Started
- Conclusion

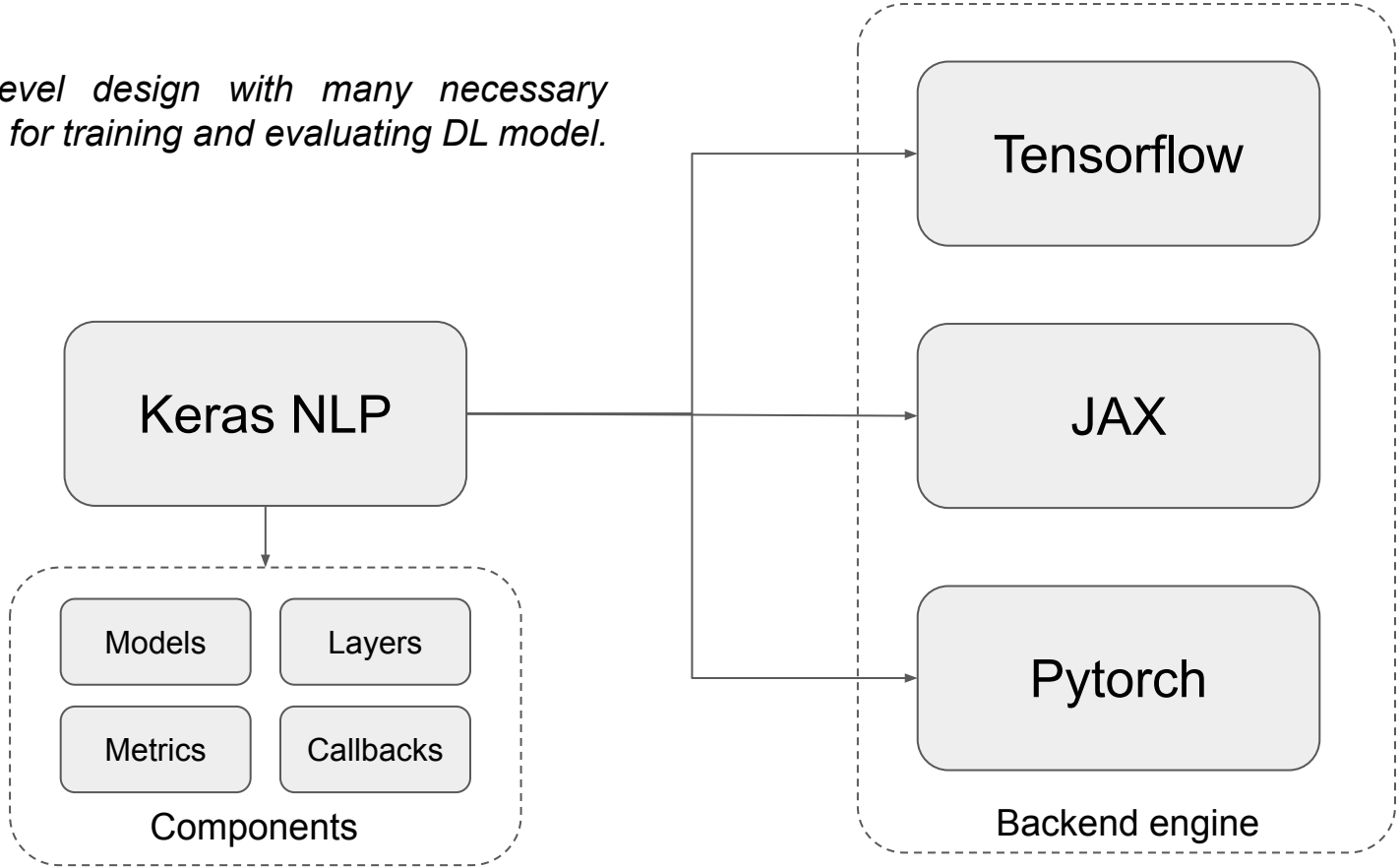
Introduce Keras NLP

1. *Adaptable with multiple kind of backends*



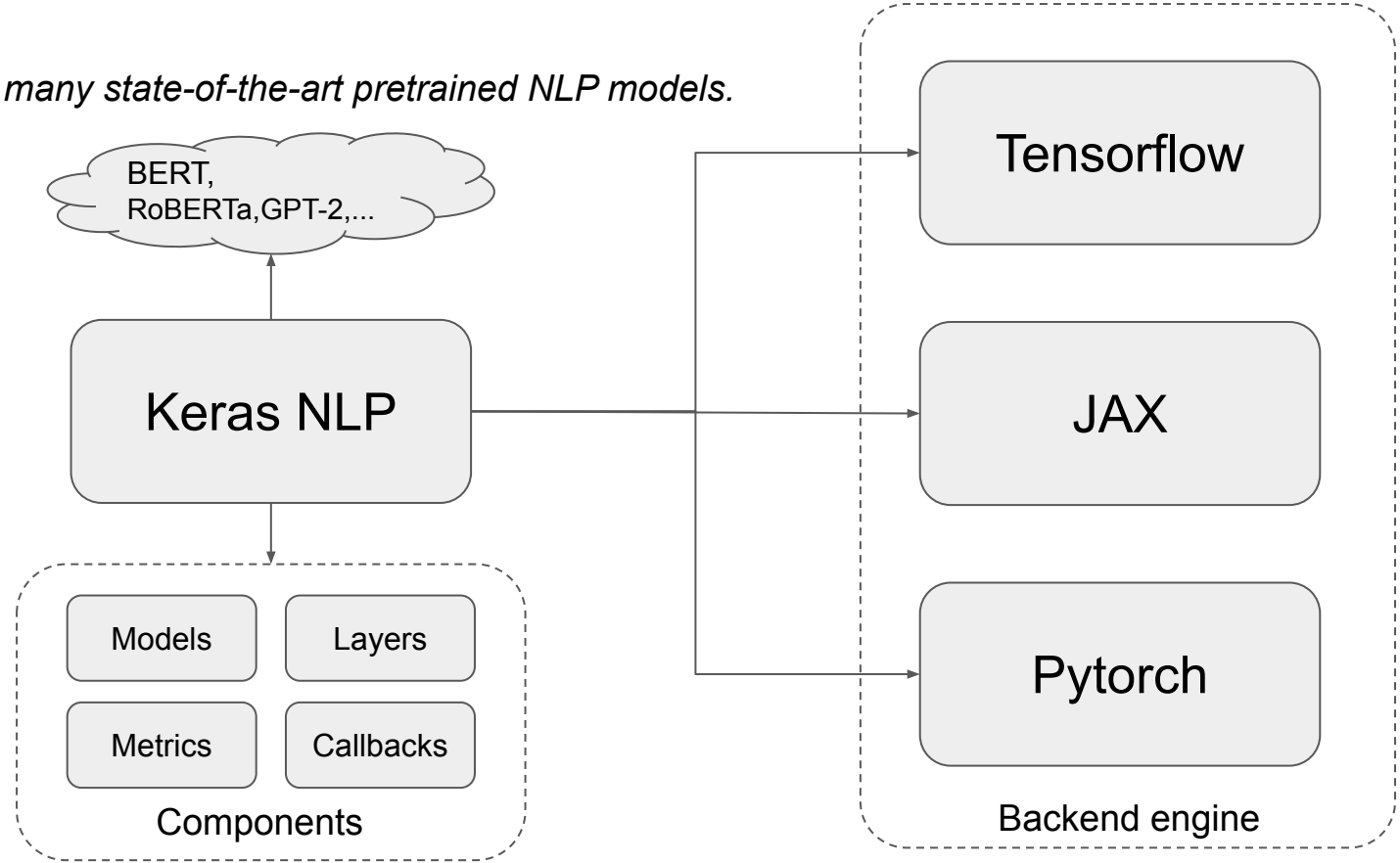
Introduce Keras NLP

2. A high-level design with many necessary components for training and evaluating DL model.



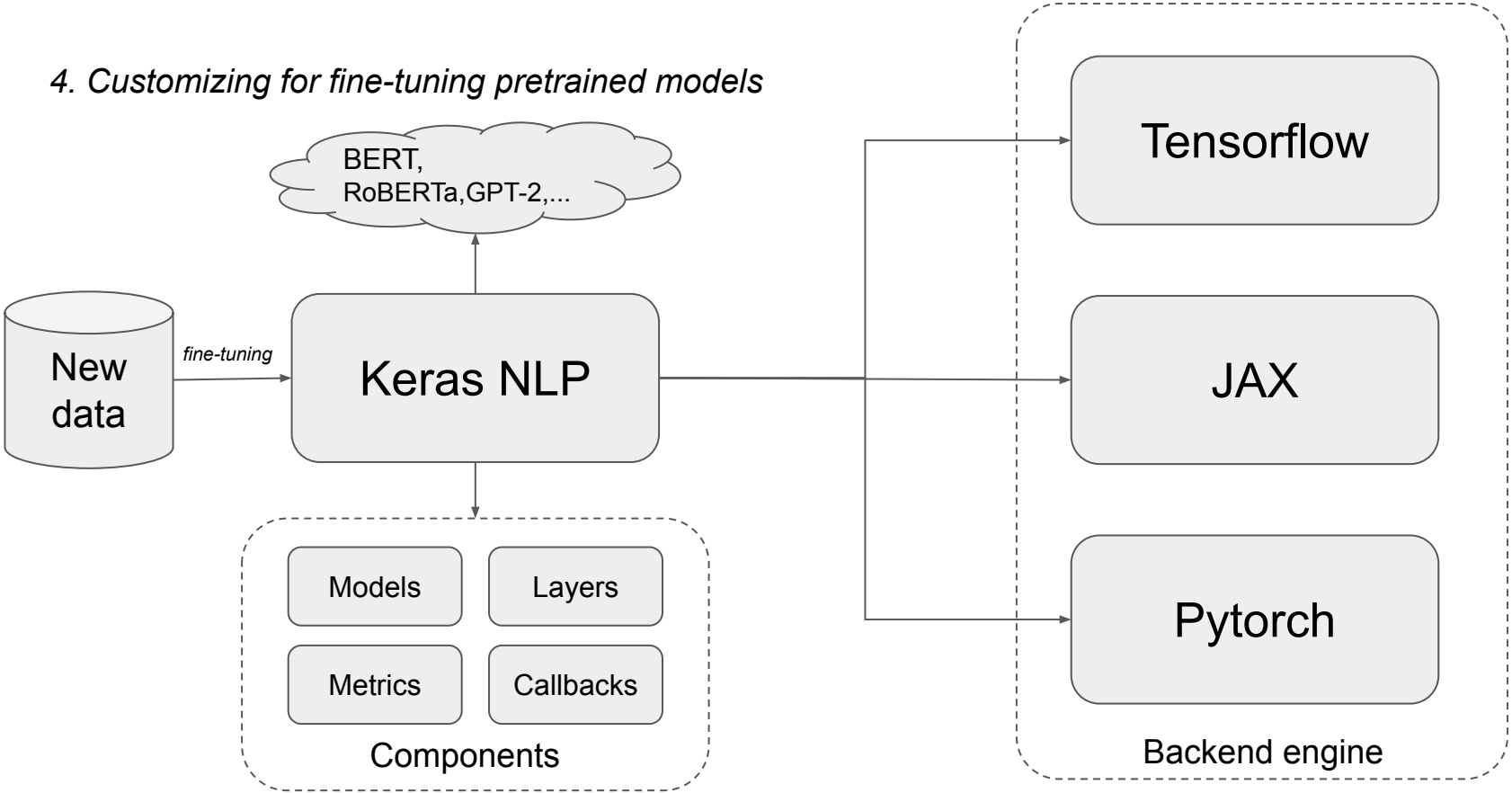
Introduce Keras NLP

3. Including many state-of-the-art pretrained NLP models.



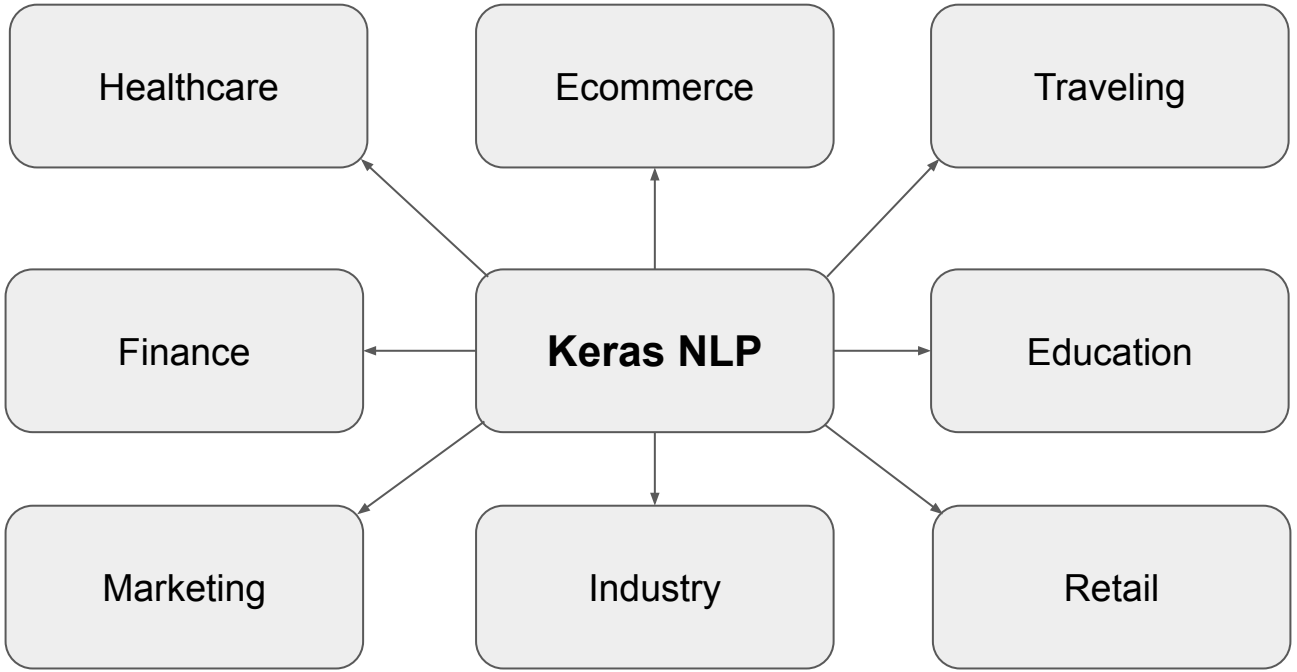
Introduce Keras NLP

4. Customizing for fine-tuning pretrained models



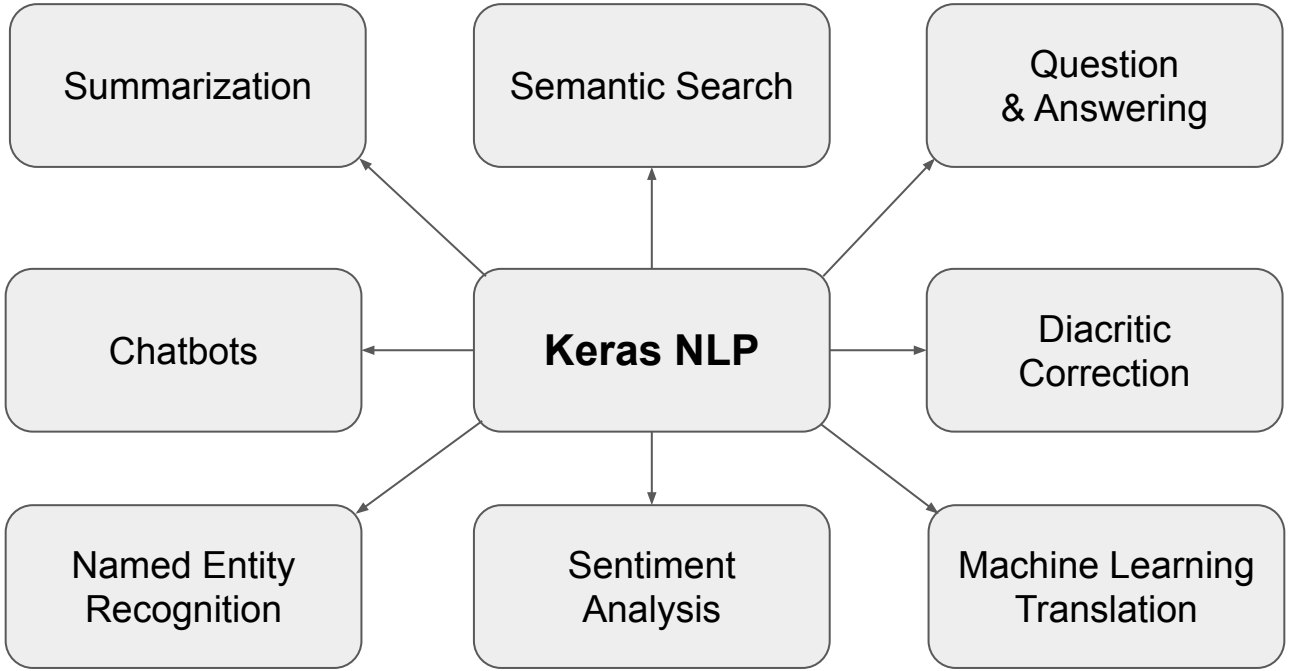
Why Keras NLP is important

The NLP’s potential in multiple-disciplines



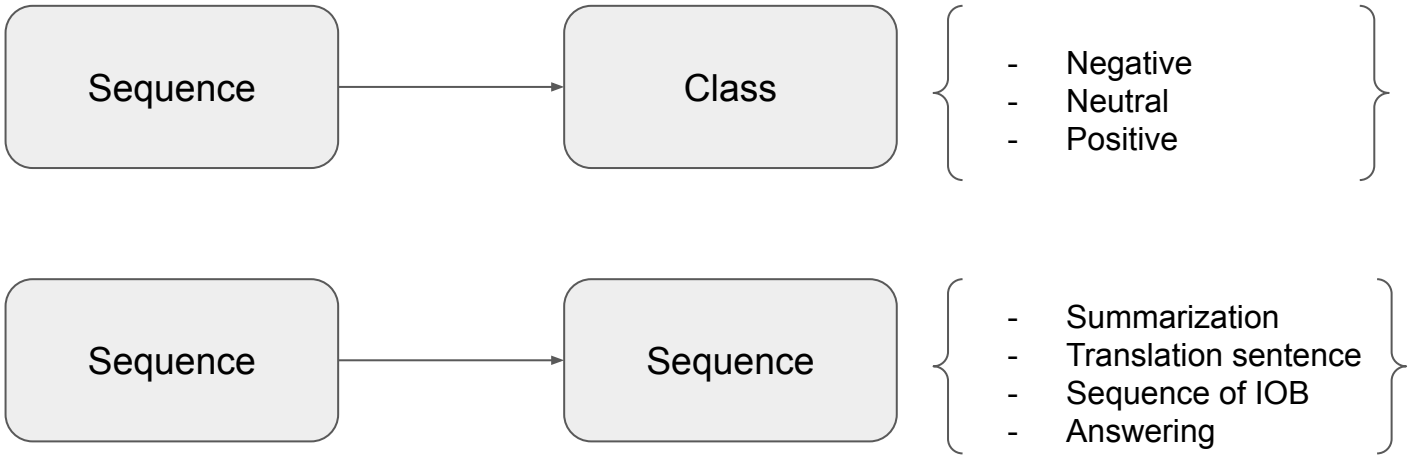
Why Keras NLP is important

Practical NLP matters



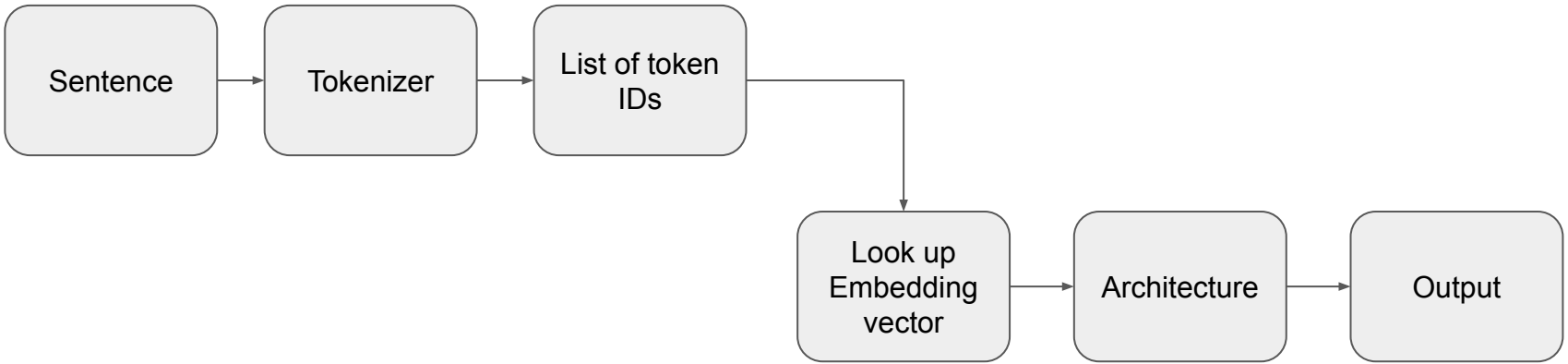
Key Features of Keras NLP

There are many kind of NLP problems. However, it can be classified into two main stereotypes



Key Features of Keras NLP

A procedure of training and inferencing one NLP problem.



Key Features of Keras NLP

Essential features of Keras NLP

- Support wide range of Pre-trained models
- Tokenization and word embedding
- Transfer learning models
- Training Sentence Embedding
- LoRA Adapter fine-tuning.
- Model quantization.
- Distributed data parallel training.

Preset name	Model	Parameters	Description
albert_base_en_uncased	ALBERT	11.68M	12-layer ALBERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
albert_large_en_uncased	ALBERT	17.68M	24-layer ALBERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
albert_extra_large_en_uncased	ALBERT	58.72M	24-layer ALBERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
albert_extra_extra_large_en_uncased	ALBERT	222.60M	12-layer ALBERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
bert_tiny_en_uncased	BERT	4.39M	2-layer BERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
bert_small_en_uncased	BERT	28.76M	4-layer BERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
bert_medium_en_uncased	BERT	41.37M	8-layer BERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
bert_base_en_uncased	BERT	109.48M	12-layer BERT model where all input is lowercased. Trained on English Wikipedia + BooksCorpus. Model Card
bert_base_en	BERT	108.31M	12-layer BERT model where case is maintained. Trained on English Wikipedia + BooksCorpus. Model Card
bert_base_zh	BERT	102.27M	12-layer BERT model. Trained on Chinese Wikipedia. Model Card

Keras NLP models

Use cases

Essential features of Keras NLP

- GPT-2 text generation
- Parameter-efficient fine-tuning of GPT-2 with LoRA
- Semantic Similarity
- Sentence embeddings using Siamese RoBERTa-networks
- Data Parallel Training
- English-to-Spanish translation
- GPT text generation from scratch
- Text Classification using FNet

Keras Examples

Components of Keras NLP

Tokenizer : keras_nlp.models.XXTokenizer

Converts raw bytes of a strings to token ids of tf.RaggedTensors .

Usage

tokenizer = keras_nlp.models.RobertaTokenizer.from_preset("roberta_base_en")

Source

Components of Keras NLP

Preprocessor : keras_nlp.models.XXPreprocessor

Converts strings to a dictionary of preprocessed tensors consumed by the backbone

Usage

```
preprocessor = keras_nlp.models.BertPreprocessor.from_preset(
    "bert_tiny_en_uncased",
    sequence_length=512,
)
```

Source

Components of Keras NLP

Backbone : keras_nlp.models.XXBackbone

Converts preprocessed tensors to dense features.

Usage

backbone = keras_nlp.models.BertBackbone.from_preset("bert_tiny_en_uncased")

Source

Components of Keras NLP

Task : keras_nlp.models.XXClassifier

Task models combine string preprocessing and the backbone model with task-specific Layers to solve a problem such as sentence classification, token classification, or text generation.

Usage

```
classifier = keras_nlp.models.BertClassifier.from_preset(
    "bert_tiny_en_uncased",
    num_classes=2,
)
```

Source

About Kaggle

- Kaggle is a data science competition platform and online community of data scientists and machine practitioners.
- Kaggle enables users to find and publish datasets, explore and build models , share code and engage in insightful discussions around Data Science.
- As of July 2023 , Kaggle has 14 million registered users.

Source1Source2

Getting Started

In this example we will start with a KerasNLP kaggle example.

- Target: classifying *Quora Insincere Questions* .
- Adjusting the number of output of pre-trained backbone RoBERTa for classification task.
- Improving model accuracy by `MultiSegmentPacker` .
- Easily training model and visualization.

KerasNLP Kaggle - Usha Rengaraju - 3X Kaggle GrandMaster

Conclusion

These are the key points drawn from this sharing.

- Keras NLP is a library based on Keras to training NLP models.
- It provides high-level layers that facilitates training deep learning models.
- Provides a wide range of SOTA pretrained NLP models.
- Able to run on multiple engines: Tensorflow, Pytorch, JAX.
- Distributed parallel training on multiple GPUs, TPUs.
- Keras NLP is suitable to quickly implement models without coding architectures from scratch.
- Fine-tuning models for variety of NLP tasks.

Reference

KerasNLP Documentation
Keras: Deep Learning Made Easier - Divya Sreepathihalli
Applied ML with KerasCV and KerasNLP - YouTube
How to Win a Kaggle Competition
Essay: Competition Cards & Recent NLP competitions

Q&A

Thank you