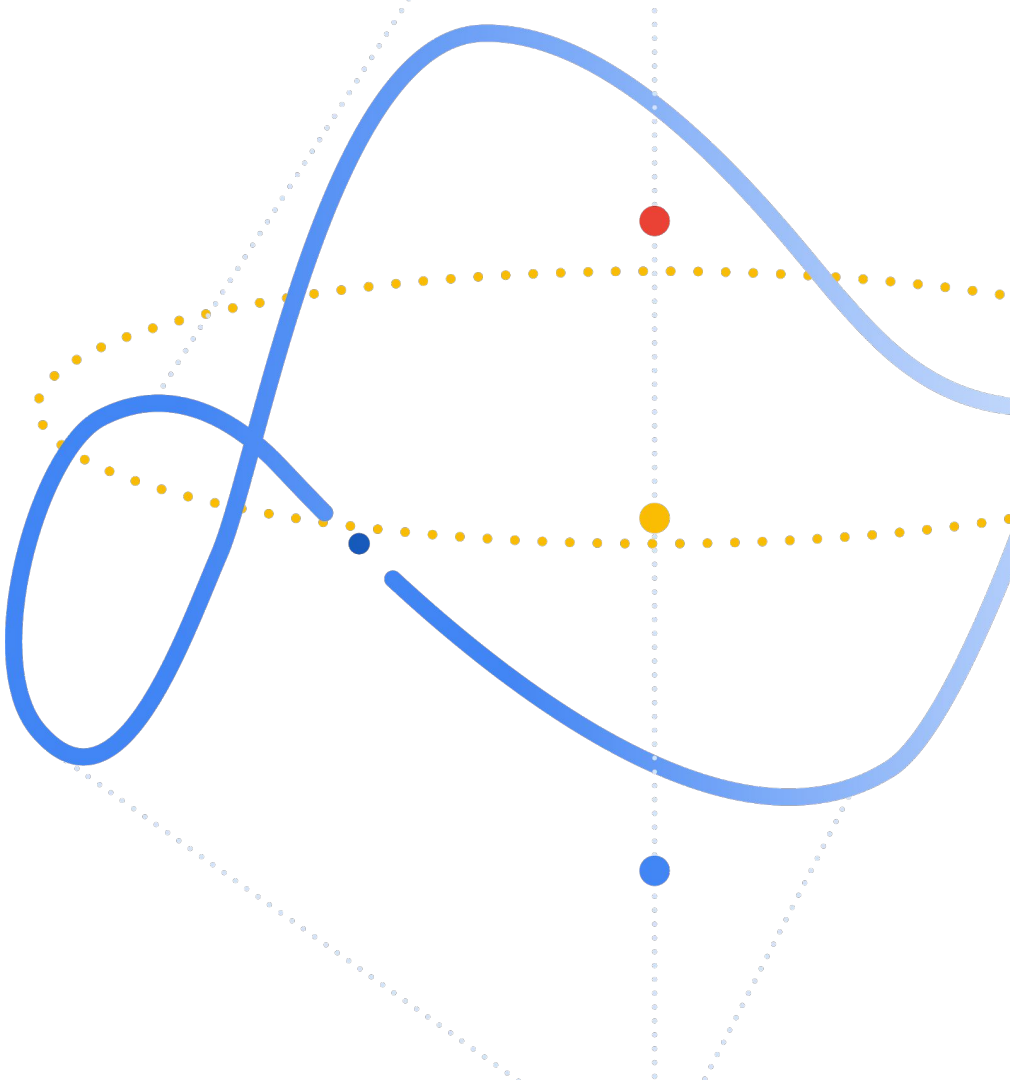
Deep Dive in NLP with Tensorflow 2.x



https://bit.ly/tfug-presentation

Abhishek Kumar, GDE-ML

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Lead Data Science Team @ Publicis Sapient, India

Masters – University of California, Berkeley

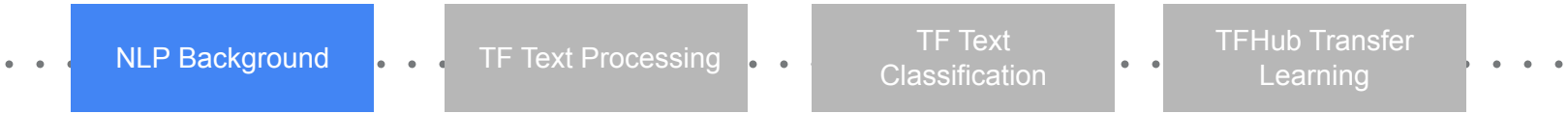
Google Developers Expert – Machine Learning

Pluralsight Author

Speaker – Strata Data, O'Reilly AI Conf , ODSC

Menti.com and use code **43 99 65**

Workshop - Plan



What is NLP ?

NLP is an approach to process, analyze and understand large amount of text data.

https://www.gartner.com/smarterwithgartner/gartner-top-10-data-analytics-trends/

Top Applications of NLP

- Machine translation
- Speech Recognition
- Question Answering
- Text summarization
- Text Classification

$26.4B

Global NLP Market by 2024

80%

Of global data by 2025 will be unstructured - IDC

https://openarticlesubmission.com/natural-language-processing-market-projected-to-grow-26-4-billion-by-2024/
https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf

https://www.gartner.com/smarterwithgartner/gartner-top-10-data-analytics-trends/

Text Modeling

IMDB Review

A big disappointment for what was touted as an incredible film. Incredibly bad. Very pretentious. It would be nice if just once someone would create a high profile role

Bag-of-words

Individual words are important

IMDB Review

A **big disappointment** for what was touted as an **incredible** film. **Incredibly bad**. Very **pretentious**. It would be **nice if** just once someone would create a high profile role

Word	Count	TF-IDF
Big	..	..
Disappointment	..	..
Incredible	..	..
Bad	..	..
Pretentious	..	..
Nice	..	..

Missing Context

Word Embedding

Use corpus context to create dense word representation

IMDB Review

A **big disappointment** for what was touted as an **incredible** film. **Incredibly bad**. Very **pretentious**. It would be **nice if** just once someone would create a high profile role

Word	Word2Vec	FastText
Big	..	..
Disappointment	..	..
Incredible	..	..
Bad	..	..
Pretentious	..	..
Nice	..	..

Only Word Level .. But how to model beyond “Word Meaning”

Text as Sequence Modeling through Deep Learning

Modeling spatial relationship

IMDB Review

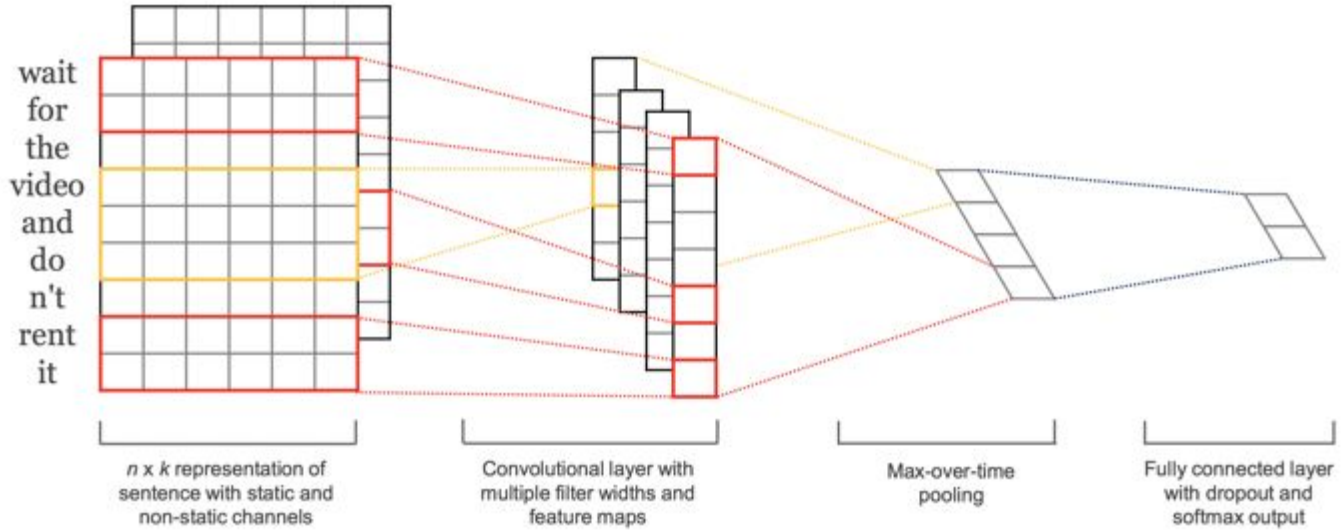
A **big disappointment** for what was touted as an **incredible** film. **Incredibly bad**. Very **pretentious**. It would be **nice if** just once someone would create a high profile role

Text as sequence modeling through deep learning

Use spatial patterns

Approaches : CNN, LSTM, Transformers etc.

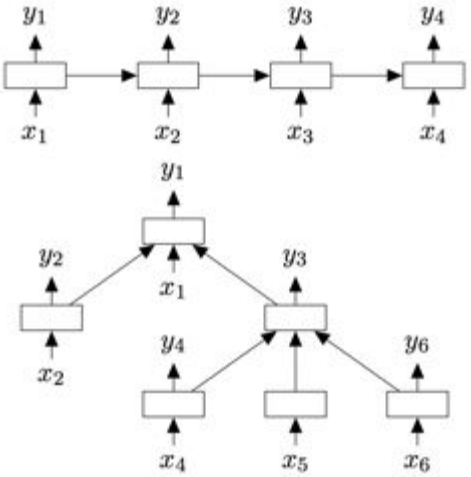
Convolutional Neural Networks



Convolutional neural networks for sentence classification, Yoon Kim (2014)

LSTM (Long Short Term Memory)

Improved Semantic Representations From Tree-Structured Long Short-Term Memory Networks, Tai et.al 2015



Chain-structured LSTM

Tree-structured LSTM

https://arxiv.org/pdf/1503.00075.pdf

O'REILLY®
Artificial Intelligence
Conference

PRESENTED WITH intel AI

Industrialized capsule networks for text analytics

Vijay Agneeswaran (Walmart Labs), *Abhishek Kumar* (Publicis Sapient)

http://bit.ly/aiconf2019

And the NLP world exploded .....

Transformers

Attention Is All You Need

Ashish Vaswani* Google Brain avaswani@google.com

Noam Shazeer* Google Brain noam@google.com

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Jakob Uszkoreit* Google Research usz@google.com

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Łukasz Kaiser* Google Brain lukaszkaiser@google.com

Illia Polosukhin* ‡ illia.polosukhin@gmail.com

BERT, RoBERT, DistillBERT ...

BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding

Jacob Devlin **Ming-Wei Chang** **Kenton Lee** **Kristina Toutanova**
Google AI Language
{jacobdevlin,mingweichang,kentonl,kristout}@google.com

Open AI : GPT, GPT-2, GPT-3

Language Models are Unsupervised Multitask Learners

Alec Radford *[1] **Jeffrey Wu** *[1] **Rewon Child**[1] **David Luan**[1] **Dario Amodei** **[1] **Ilya Sutskever** **[1]

HUGGING FACE

On a mission to solve NLP,
one commit at a time.

Workshop - Plan

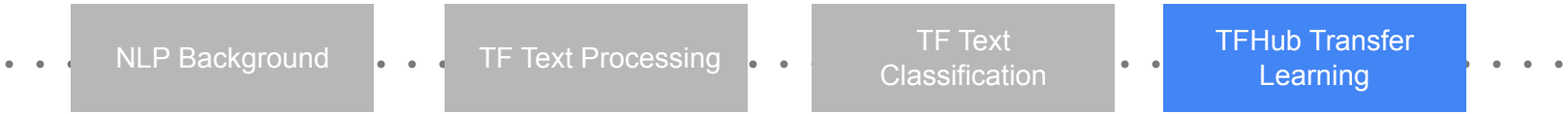
Demo : Basic NLP with TF2.x

https://bit.ly/tfug-01

Demo : Text Classification with TF2.x

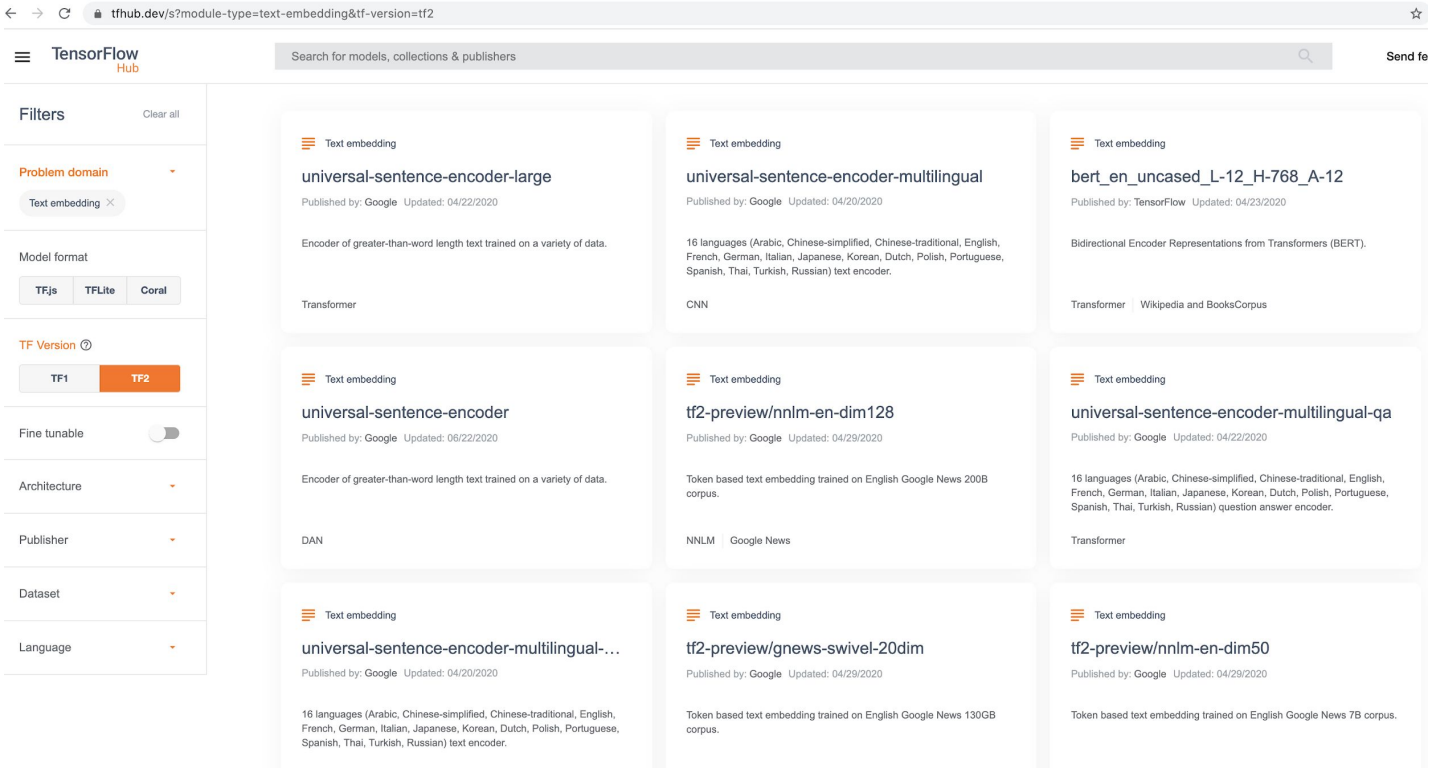
https://bit.ly/tfug-02

Workshop - Plan



Tensorflow Hub

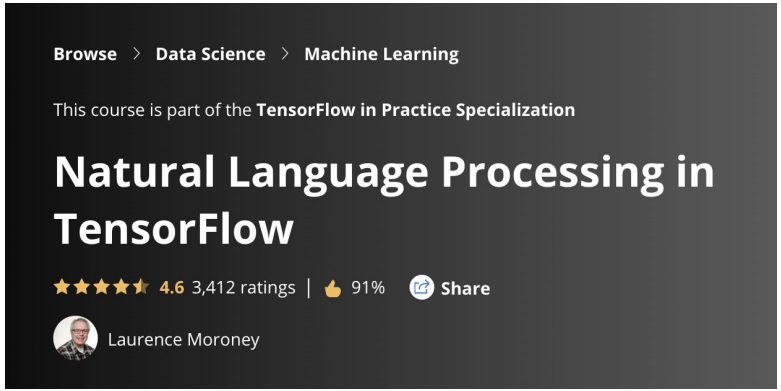
https://tfhub.dev/

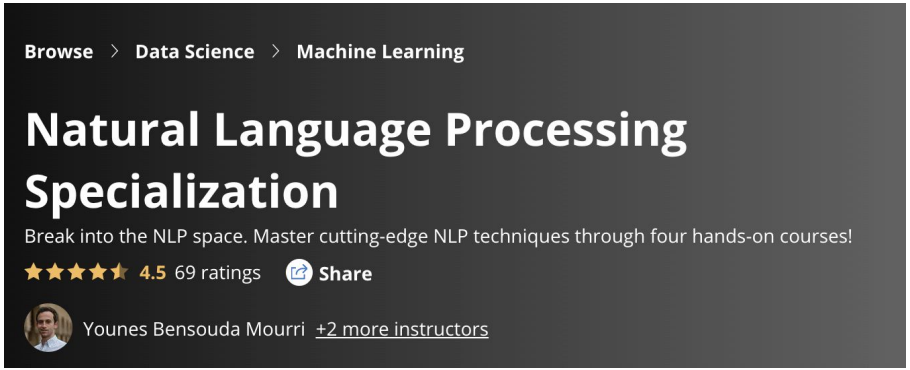


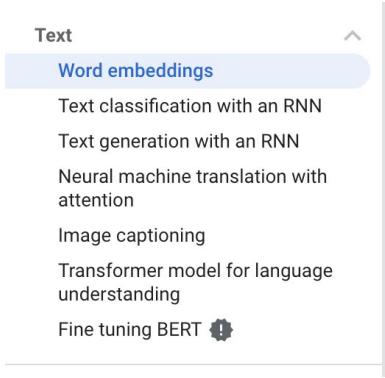
Demo : NLP with TFHub

https://bit.ly/tfug-03

Resources







https://www.tensorflow.org/tutorials/text/word_embeddings

Thank You