

# Exploring Blend of Transfer and Meta Learning Techniques in Natural Language Processing

B.Tech Computer Science & Engineering  
Maharaja Agrasen Institute of Technology  
(GGSIPU)

Team Blitzkrieg

Member 1: Vasudev Awatramani 36714802716

Member 2: Meghansh Goel 05914802716

## ABSTRACT

Natural language processing (NLP) is one of the most prominent technologies of the information age. Understanding complex language utterances is also a crucial part of artificial intelligence. Applications of NLP are everywhere because people communicate almost everything in language: web search, advertisement, emails, customer service, language translation, radiology reports, etc. There are a great variety of underlying tasks and machine learning models powering NLP applications. Recently, deep learning approaches have obtained very high performance across many different NLP applications (The year 2018 has been designated as "The Year of Natural Language Processing"). These models can often be trained with a single end-to-end model and do not require traditional, task-specific feature engineering. Therefore, NLP researchers are presently having their "ImageNet moment" as once Computer Vision researchers did.

In practice, very few practitioners train an entire Network from scratch (with random initialization), because it is relatively rare to have a dataset of sufficient size. Instead, it is prevalent to pretrain a Neural Network on a very large dataset and then use the network either as an initialization or a fixed feature extractor for the task of interest. Widely utilised in the field of computer vision, we extend the intuition of Transfer Learning to Natural Language Processing. BERT (Bidirectional Encoder Representations from Transformers) is a recent paper published by researchers at Google AI Language. BERT's key technical innovation is applying the bidirectional training of Transformer, a popular attention model, to language modelling. This is in contrast to previous efforts which looked at a text sequence either from left to right or combined left-to-right and right-to-left training. This bidirectionally trained language model has a deeper sense of language context and flows than single-direction language models. Henceforth, we employ BERT as a feature extractor for our NLP pipeline.

(8800896376  
vasudev.w13@gmail.com)

(9968966663  
meghansh.work@gmail.com)

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(Dr. P. S. J. A.)