



# The importance of fillers for text representations of speech transcripts.

Oral Presentation at WACAI 2021

Tanvi Dinkar<sup>✳️🌸</sup>, Pierre Colombo<sup>✳️🌸🌼</sup>  
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Jorge Cham, [www.phdcomics.com](http://www.phdcomics.com)

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# Pretrained Language Models

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That is quite the rap sheet, Prison Mike.

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Predict

quite sheet



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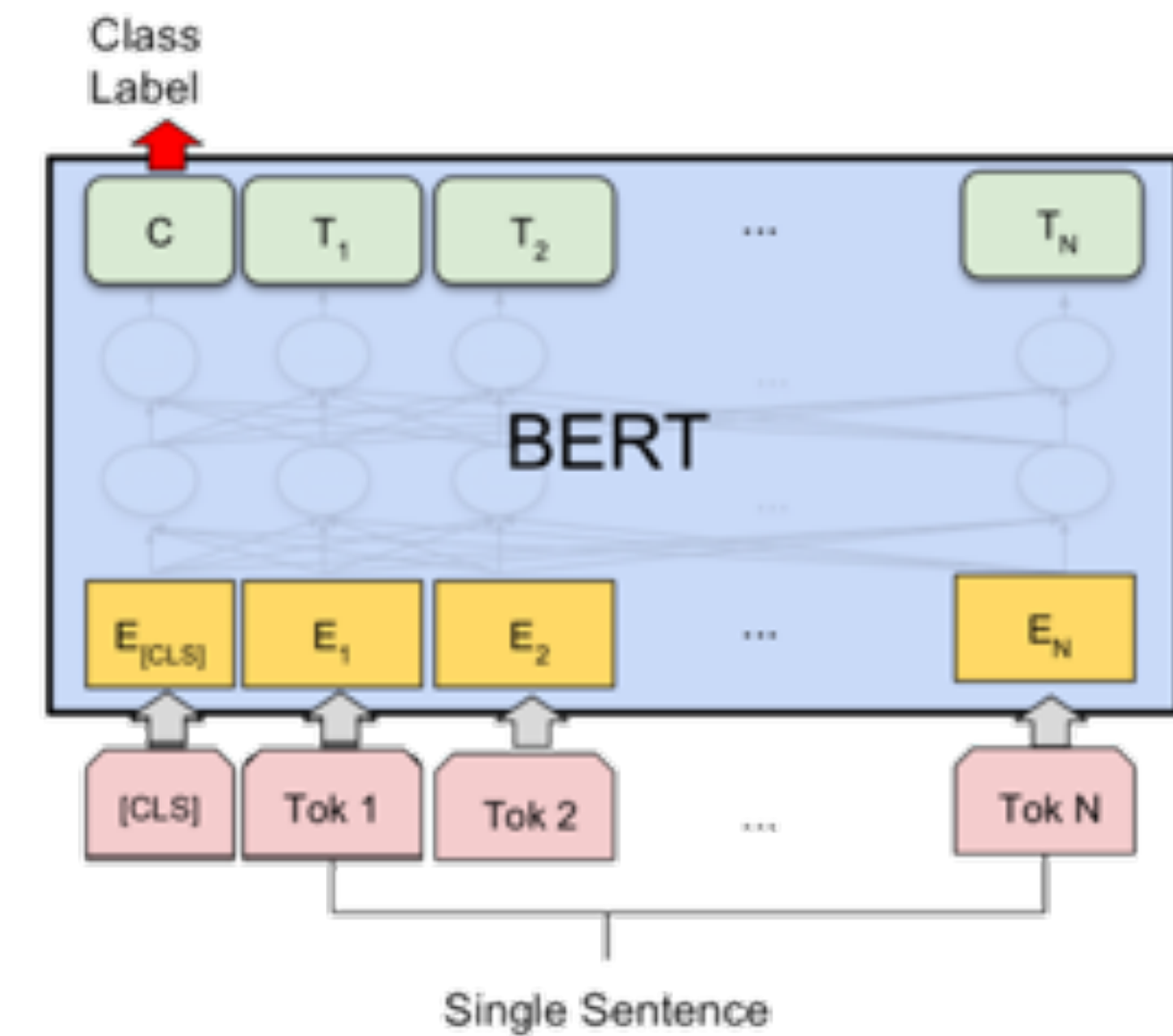
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(b) Single Sentence Classification Tasks:  
SST-2, CoLA

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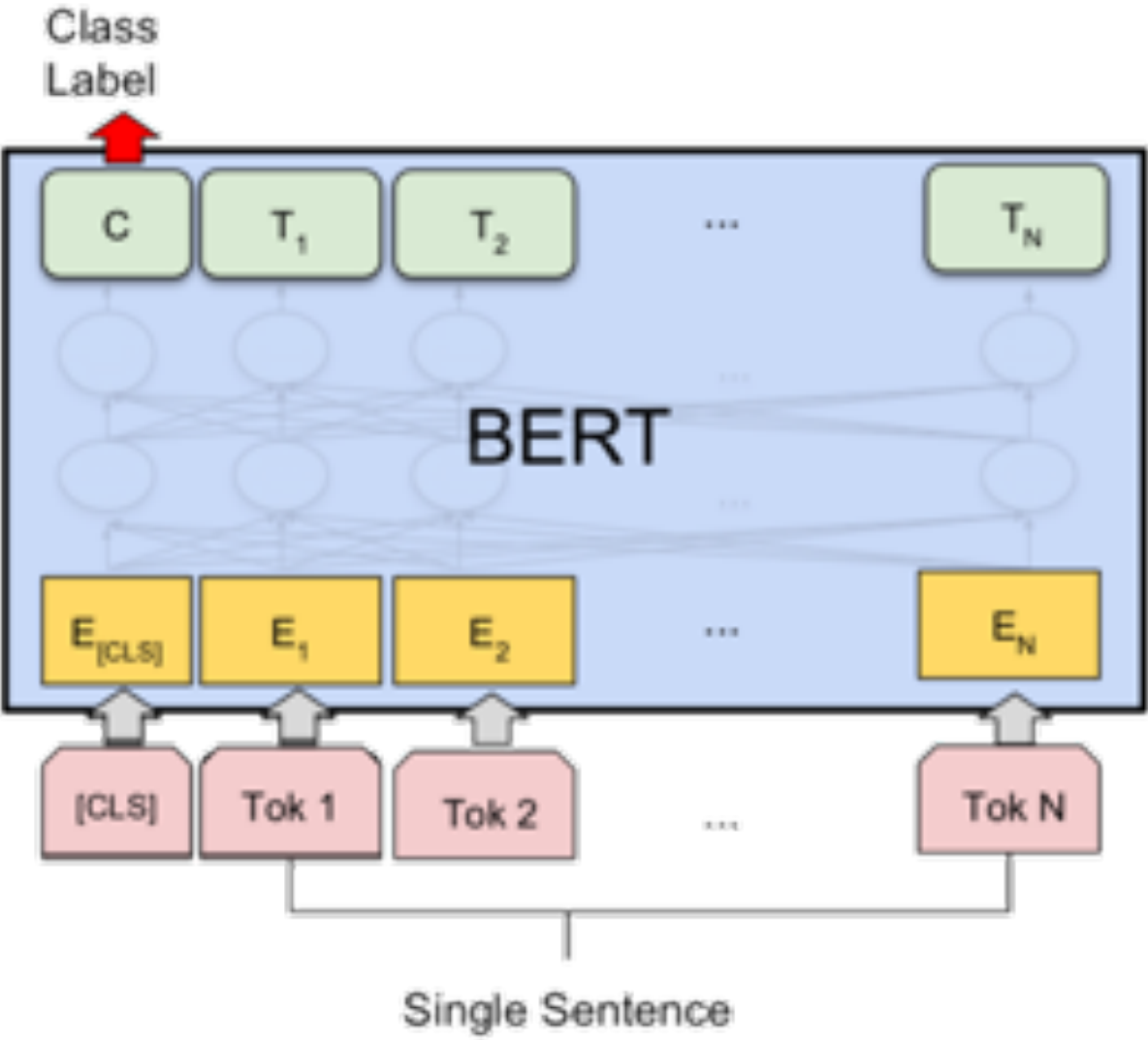
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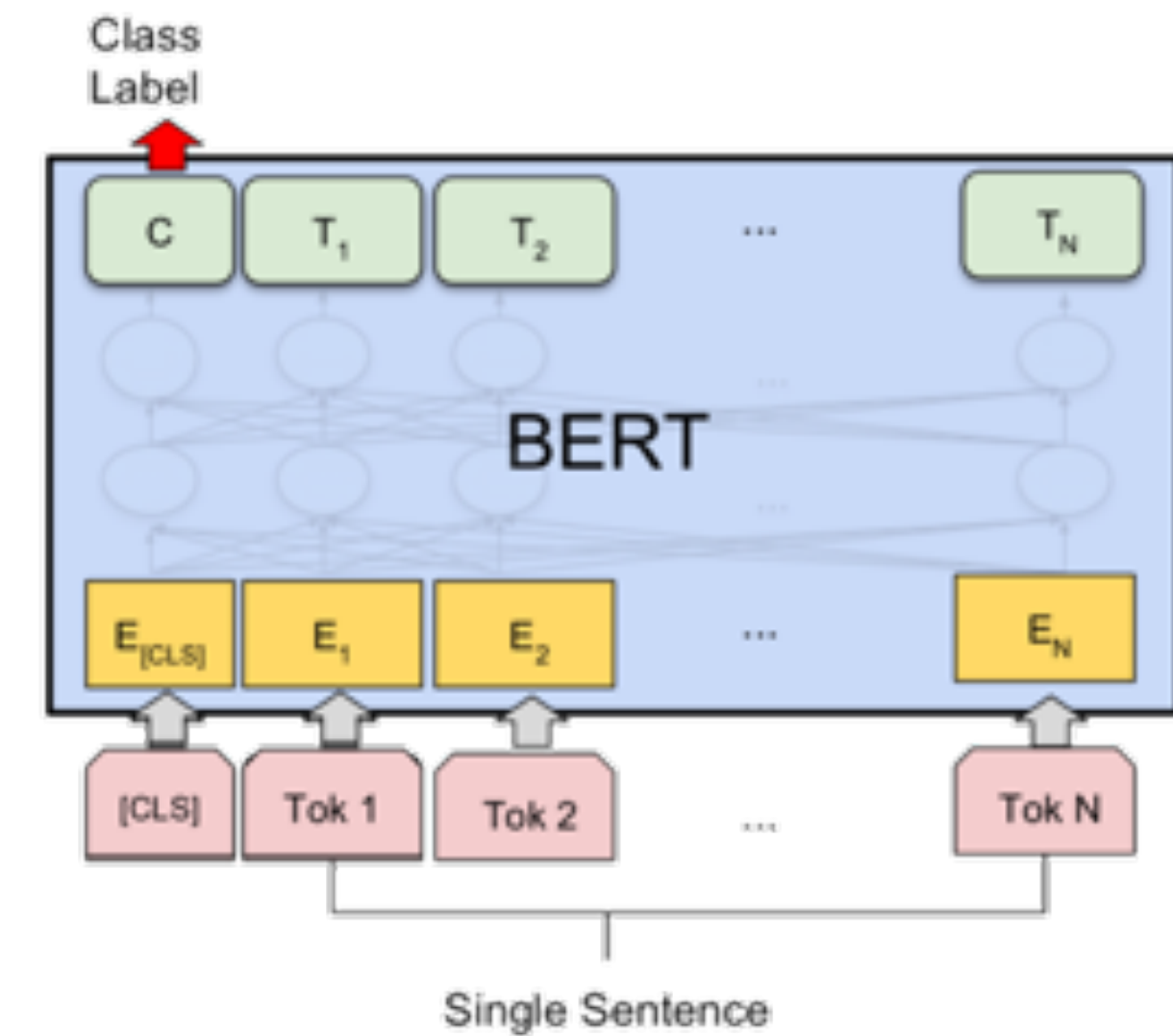
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**Predict**

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Finetuning

Classification



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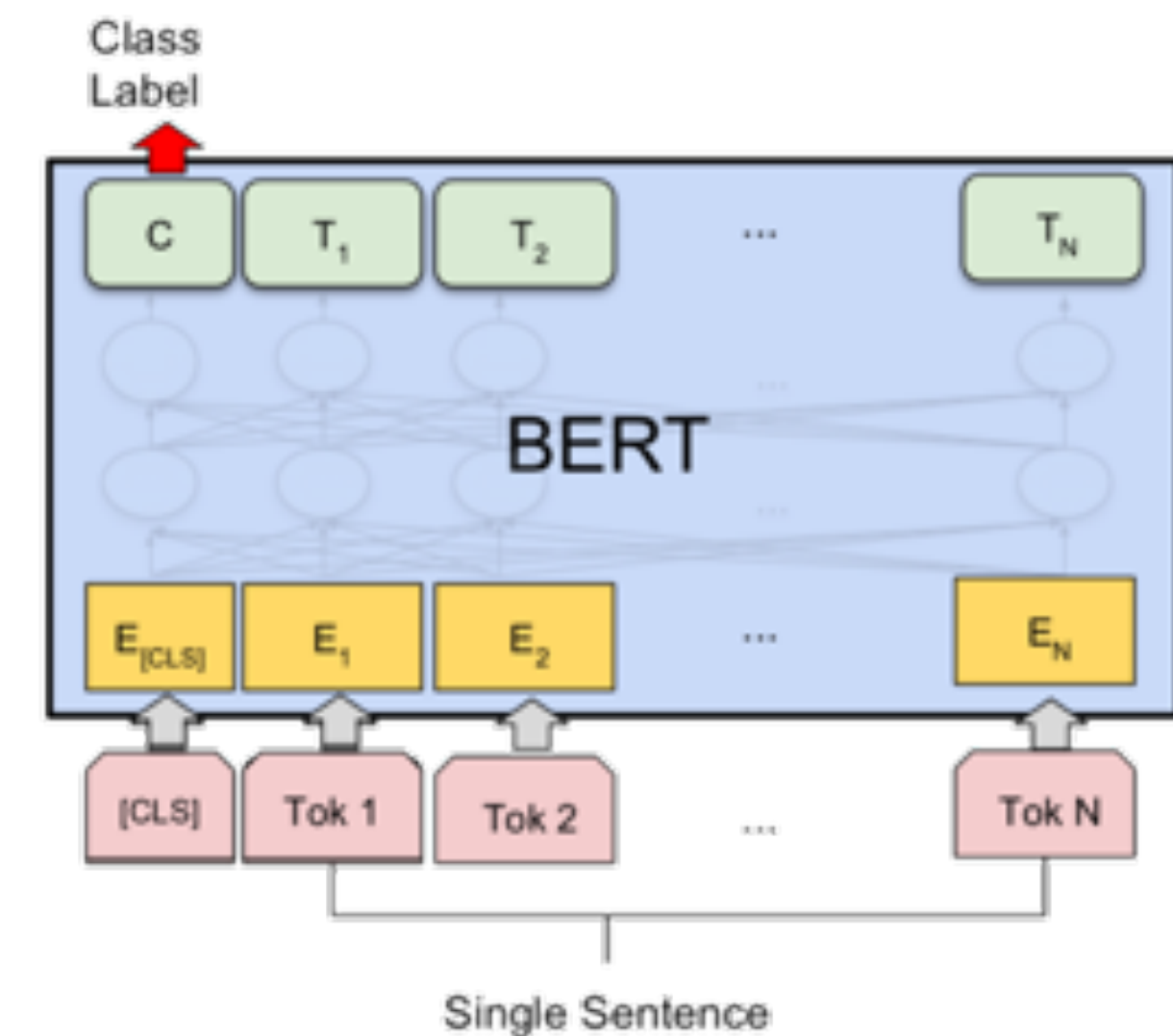
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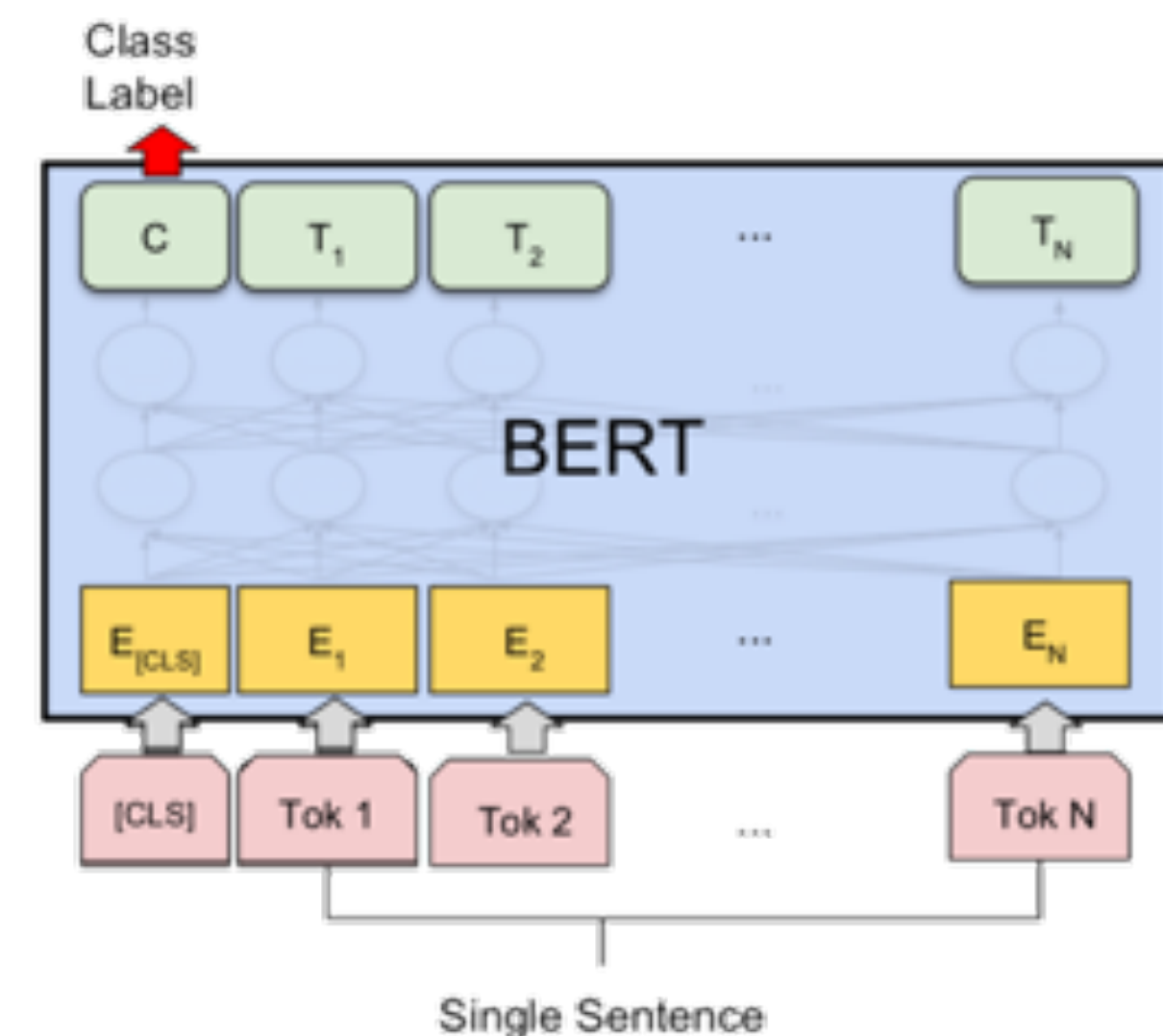
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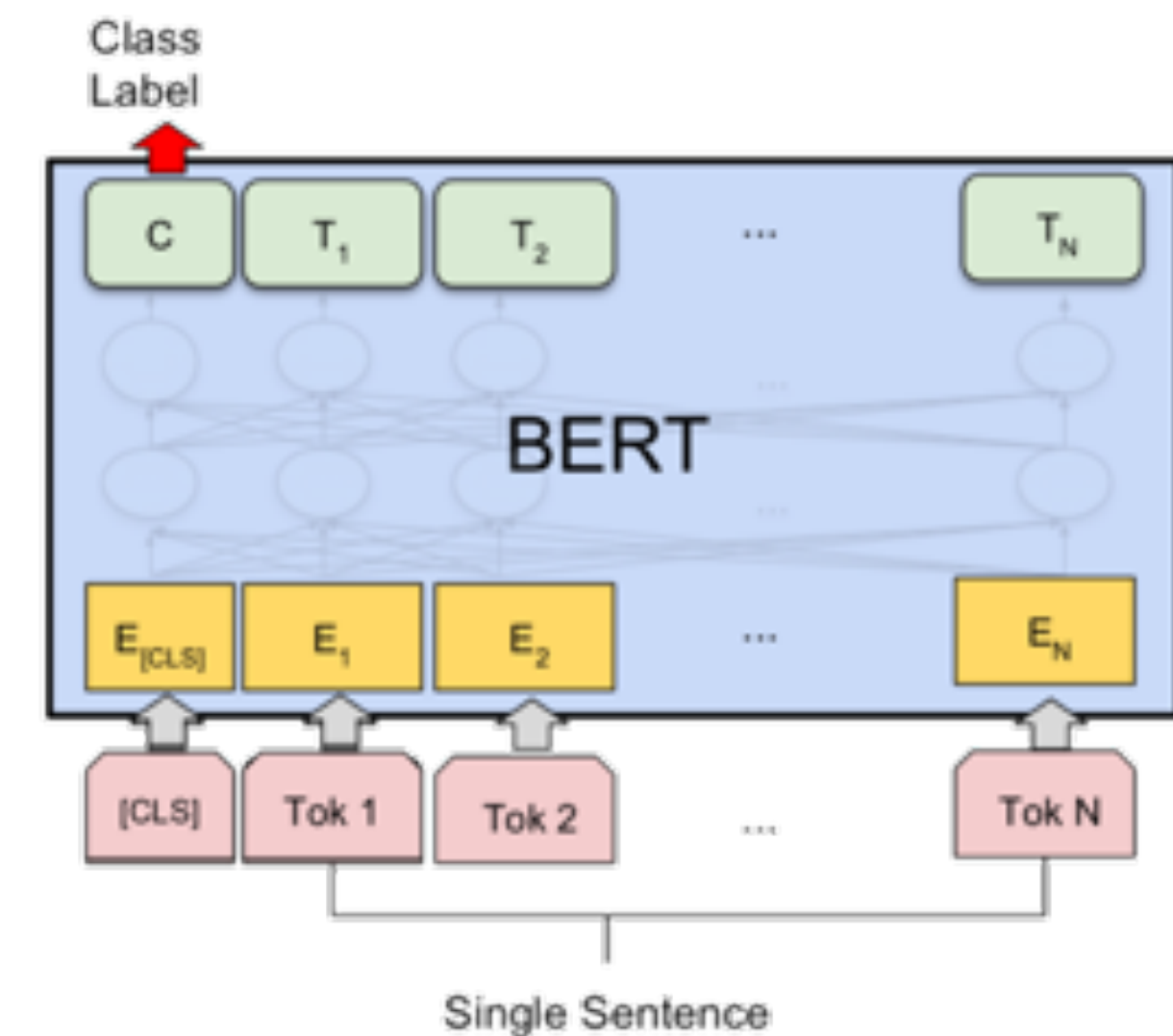
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# Aim

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**Goal: Computational study of Fillers with pertained LM**

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**Studied Observations**

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- Experimental validation of O1,O2, **without handcrafting features**.
- Efficiently represent and study informativeness of fillers **using SOTA models**.

# Dataset

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- Annotations of **fillers** and **confidence** available.
- **Monologues**, dialogue related disfluencies (such as backchannels) are not present.

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<b>PS1: Fillers removed</b> (Training + inference)	<b>PS3: Fillers kept</b> (Training + Inference)
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**PS3** **TR1** [ 'um', 'things', 'things', 'that', 'uh' ... ]

**TR2** [ ' [ FILLER-UM ] ', 'things', 'that', ' [ FILLER-UH ] ' ... ]

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**PS3**

**TR1** [ 'um', 'things', 'things', 'that', 'uh' ... ]

**TR2** [ ' [ FILLER-UM ] ', 'things', 'that', ' [ FILLER-UH ] ' ... ]

- Optionally **fine-tune BERT** for each **PS** and **TR**, using **MLM**.



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w/o fine-tuning	PS1: Fillers removed (Training + inference)	22
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w fine-tuning	PS1: Fillers removed	5.5
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Best Token Representation		Perplexity
PS3	TR1: No treatment	4.6
	TR2/3: Treatment	4.7

## **O2: Fillers and the listener's perception of the speaker's confidence.**

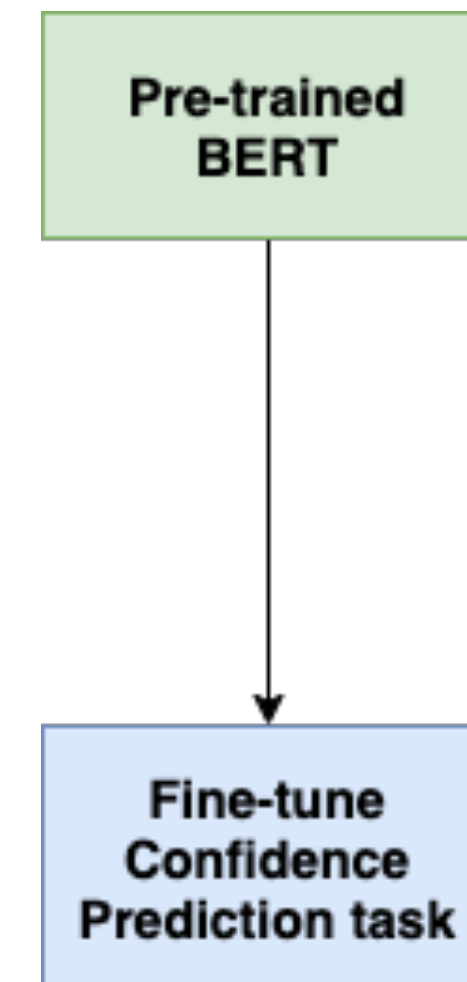
## **O2: Fillers and the listener's perception of the speaker's confidence.**

- **Downstream confidence prediction task, informative.**
  - **Adding a Multi-Layer Perceptron (MLP) on top of a BERT.**
  - **Same pre-processing PS as before, fixed token rep TR1.**
  - **Optionally fine-tuned using the MLM.**
  - **Mean Squared Error (MSE) loss.**



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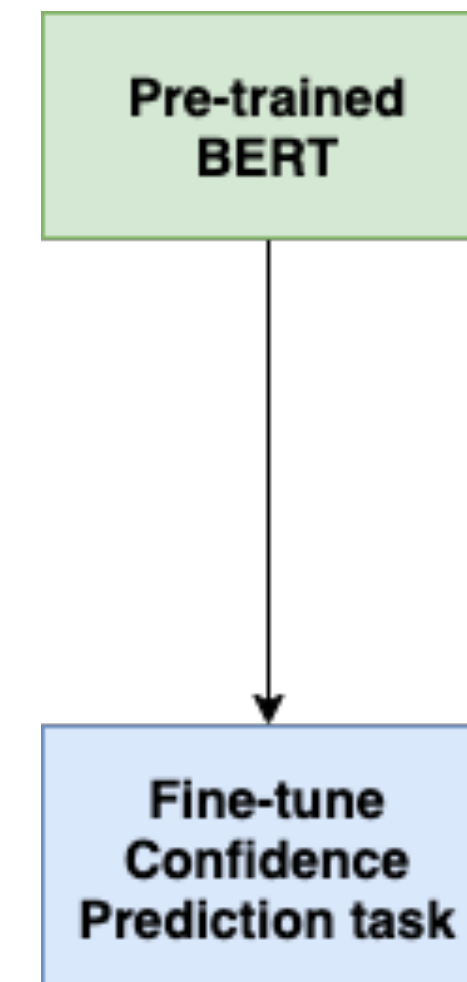
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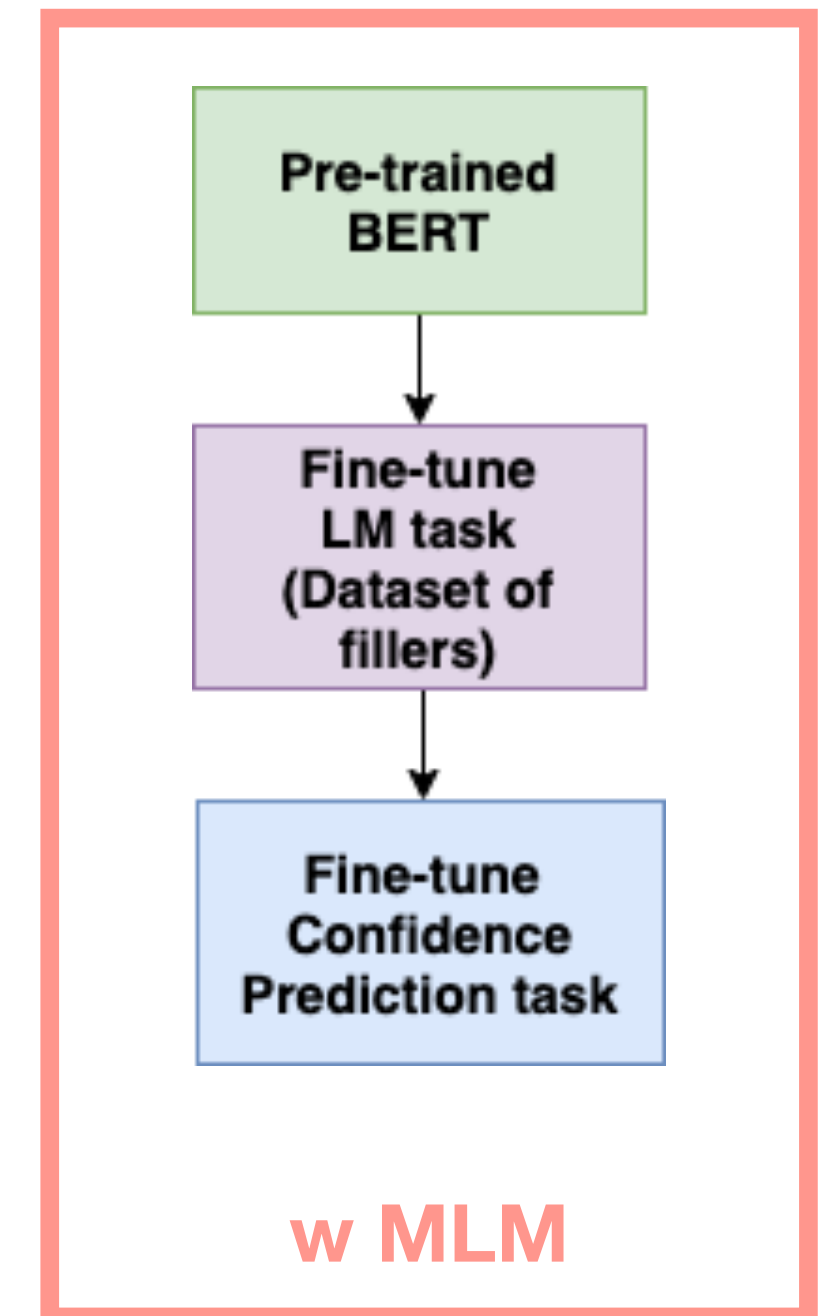
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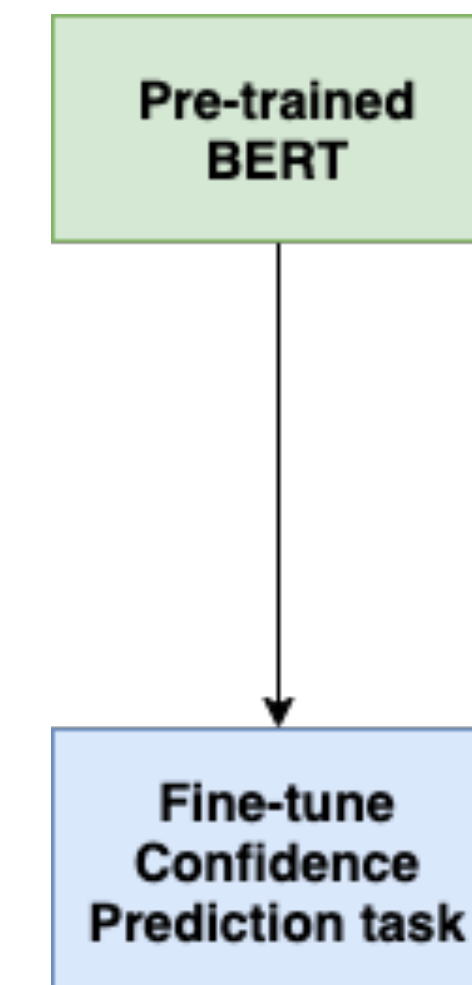
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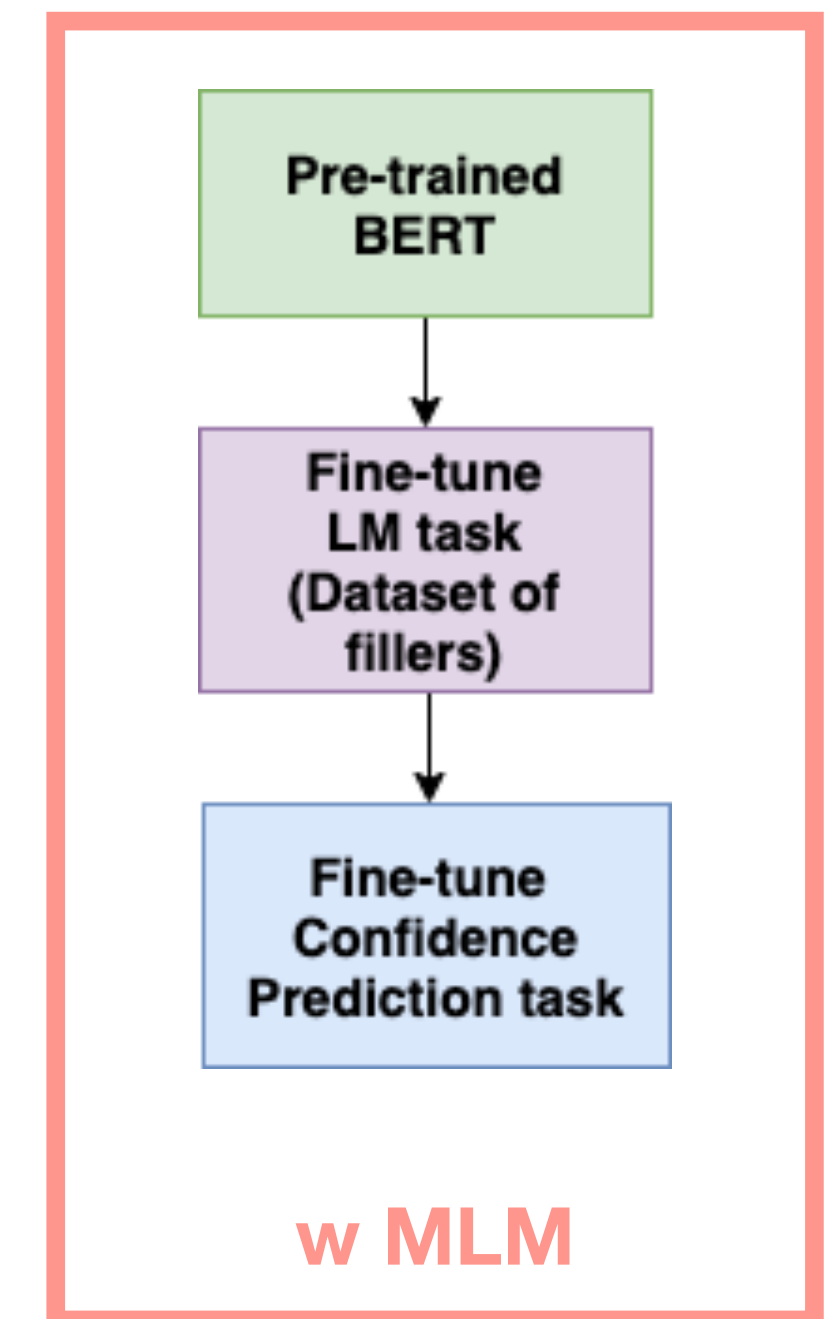
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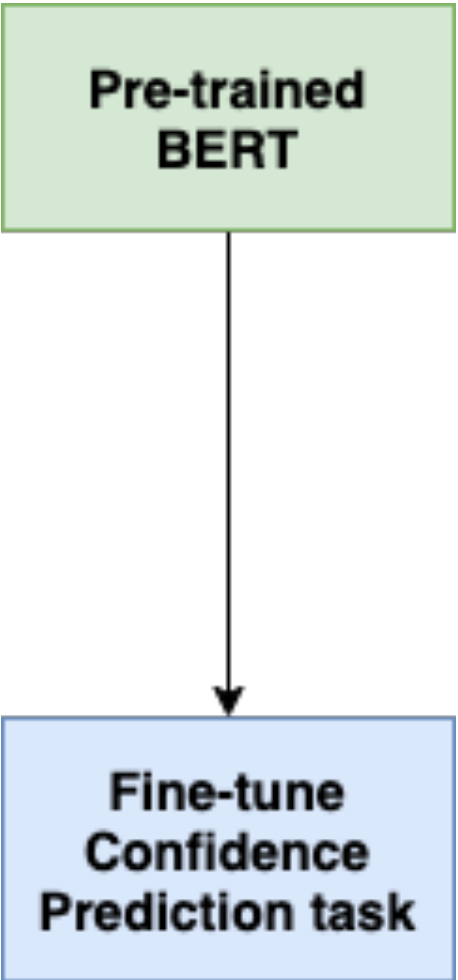
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  - **PS3 (Fillers kept in training+inference)** outperform other PS, both with/without MLM fine tune.
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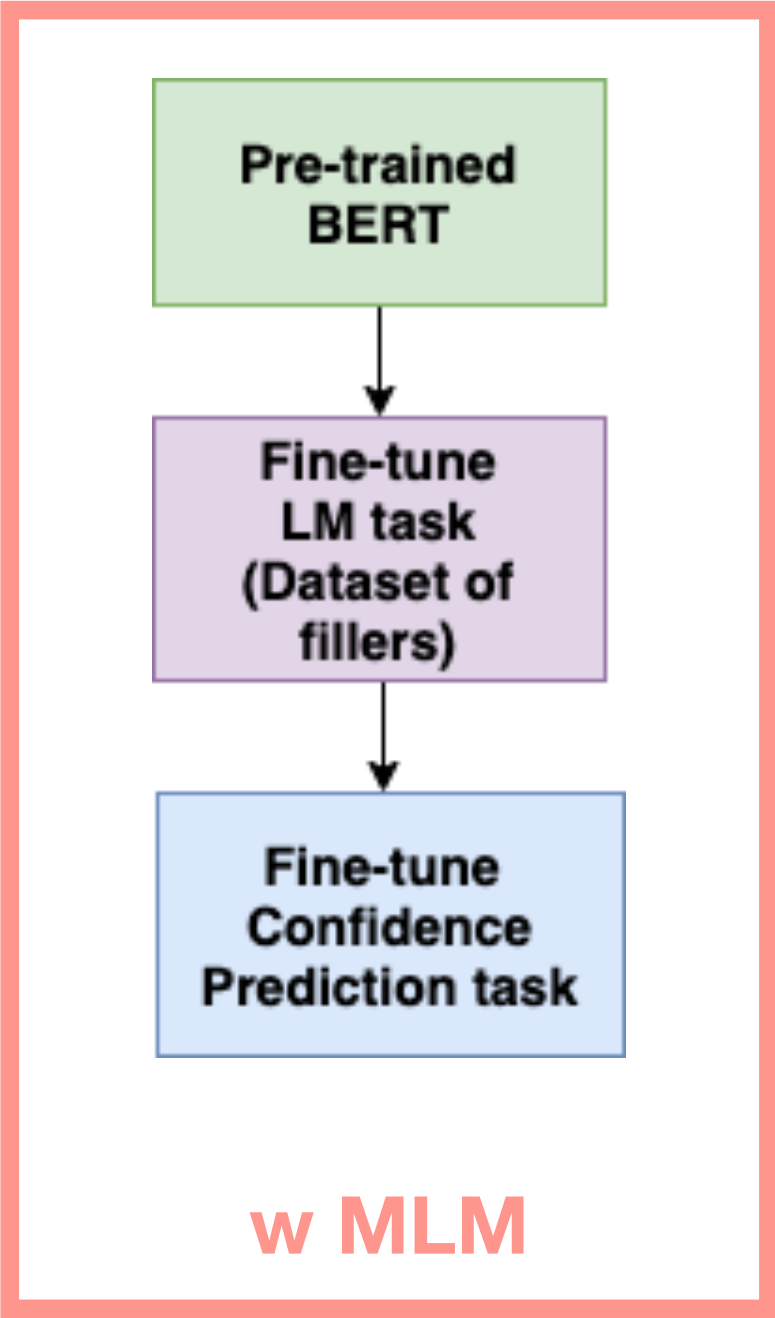
Confidence Prediction task		MSE
w/o MLM	PS1: Fillers removed	1.47
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Thesis of Tanvi Dinkar: Representation of disfluencies in spoken language understanding!

January 2022

# Thanks for listening

**Title: The importance of fillers for text representations of speech transcripts.**

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Tanvi Dinkar



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Link to Paper



Link to POM

