

# SwitchPrompt: Learning Domain-Specific Gated Soft Prompts for Classification in Low-Resource Domains



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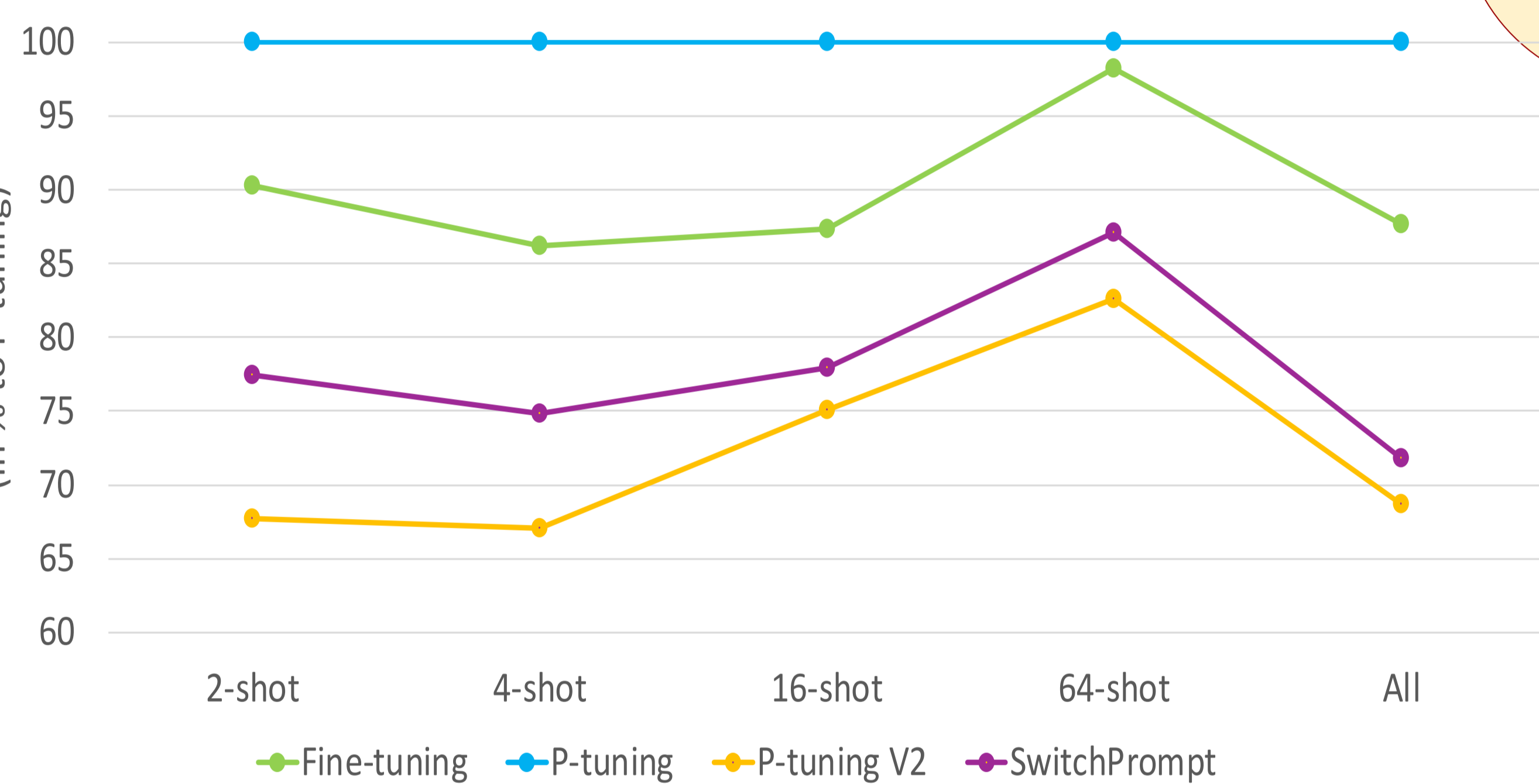
Invented for life

## Abstract

We propose SwitchPrompt, a novel and lightweight prompting methodology for the **adaptation of language models** trained on datasets from the **general domain** to diverse **low-resource domains**

## Contributions

- ❖ A novel **soft-prompting** methodology using **trainable semantic gates**
- ❖ Eliminates the need of **domain-specific** language model **pretraining** (**less computational resource** needed)
- ❖ Has the ability to **switch** between domain-oriented prompting and general prompting
- ❖ Generic language models achieve **state-of-the-art** classification results over domain specific language models on **low resource domains** using **SwitchPrompt**

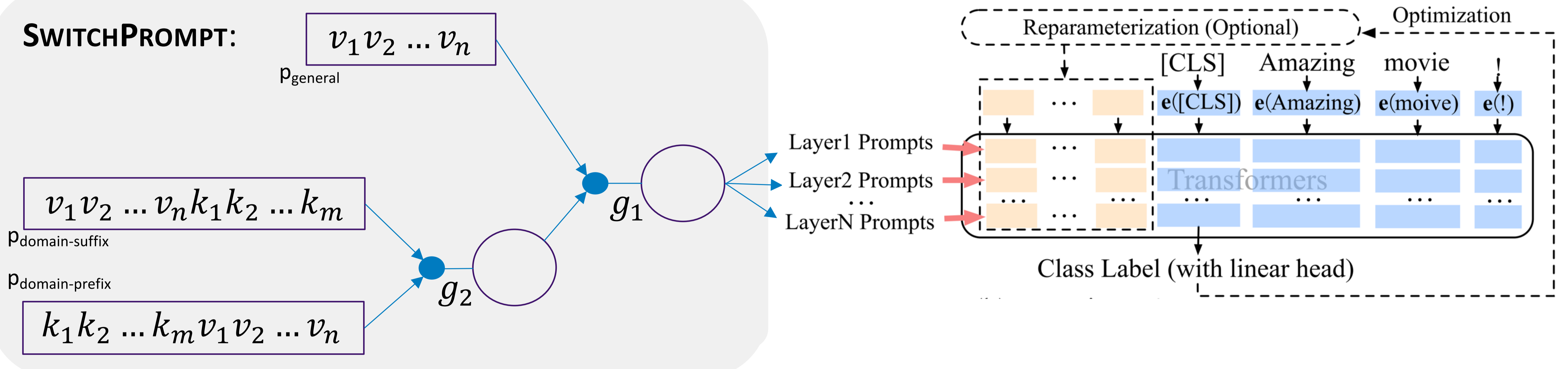


Methodology	Model	2-shots	4-shots	16-shots	64-shots	All
Fine-tuning	BERT	33.3	53.3	71.4	88.7	95.7
P-tuning V2	BERT	56.0	63.3	79.4	<b>92.5</b>	96.8
SwitchPrompt	BERT	<b>66.7</b>	<b>72.4</b>	<b>88.3</b>	91.2	<b>97.6</b>

Results on general-domain dataset TREC.

$$\text{Prompt} = g_1 * p_{\text{general}} + (1 - g_1) * (g_2 * (p_{\text{domain-prefix}}) + (1 - g_2) * (p_{\text{domain-suffix}}))$$

## SWITCHPROMPT:



Methodology	Model	2-shots	4-shots	16-shots	64-shots	All
Fine-tuning	BERT	21.2	25.5	40.8	67.4	81.8
	Clinical BERT	35.9	40.4	56.3	68.1	82.5
P-tuning	BERT	<b>48.3</b>	48.9	53.1	68.1	82.0
	Clinical BERT	<b>49.2</b>	53.1	58.2	69.6	82.8
P-tuning V2	BERT	27.2	44.4	61.9	79.1	84.0
	Clinical BERT	34.3	48.7	63.4	<b>82.3</b>	86.7
SwitchPrompt	BERT	36.3	<b>54.2</b>	<b>64.0</b>	<b>81.1</b>	<b>85.4</b>
	Clinical BERT	40.9	<b>55.2</b>	<b>65.1</b>	81.9	<b>86.9</b>

Results on special-domain dataset GARD.

Methodology	Model	2-shots	4-shots	16-shots	64-shots	All
Fine-tuning	BERT	18.2	26.1	48.5	54.6	61.9
	SciBERT	29.4	32.7	50.4	56.2	64.7
P-tuning	BERT	<b>37.5</b>	<b>38.2</b>	52.6	58.5	64.9
	SciBERT	<b>42.1</b>	<b>43.4</b>	54.8	59.3	66.2
P-tuning V2	BERT	30.8	31.2	52.8	59.9	68.4
	SciBERT	33.7	35.6	53.9	61.4	69.7
SwitchPrompt	BERT	32.4	34.3	<b>53.4</b>	<b>61.0</b>	<b>69.9</b>
	SciBERT	36.2	37.1	<b>55.9</b>	<b>62.5</b>	<b>70.6</b>

Results on special-domain dataset SOFC-Exp.