



SOLAR : A Self-Optimizing Open-Ended Autonomous Agent for Lifelong Learning and Continual Adaptation



Nitin Vetcha^{1,2}, Dianbo Liu¹

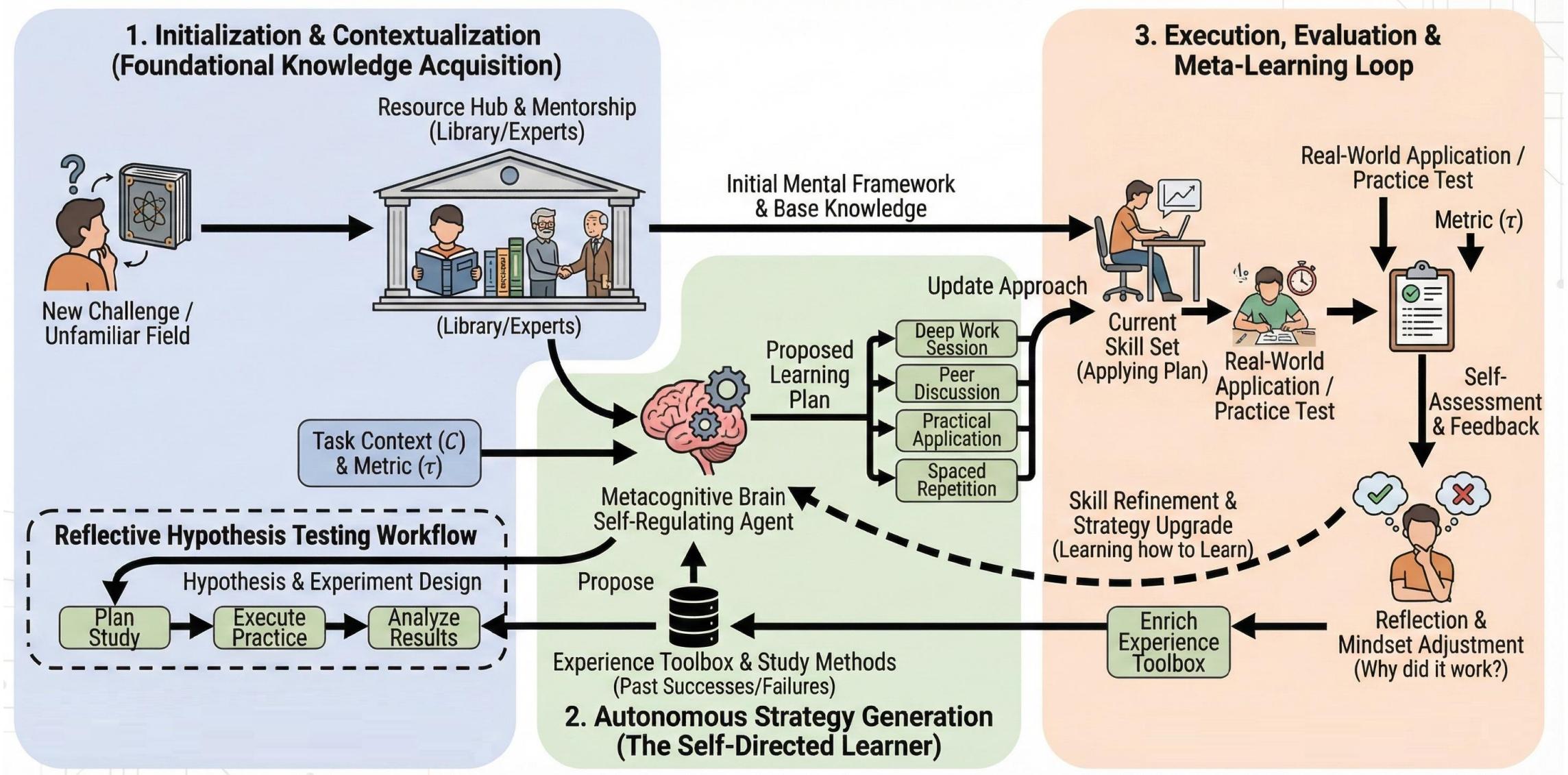
¹National University of Singapore

²Indian Institute of Science, India



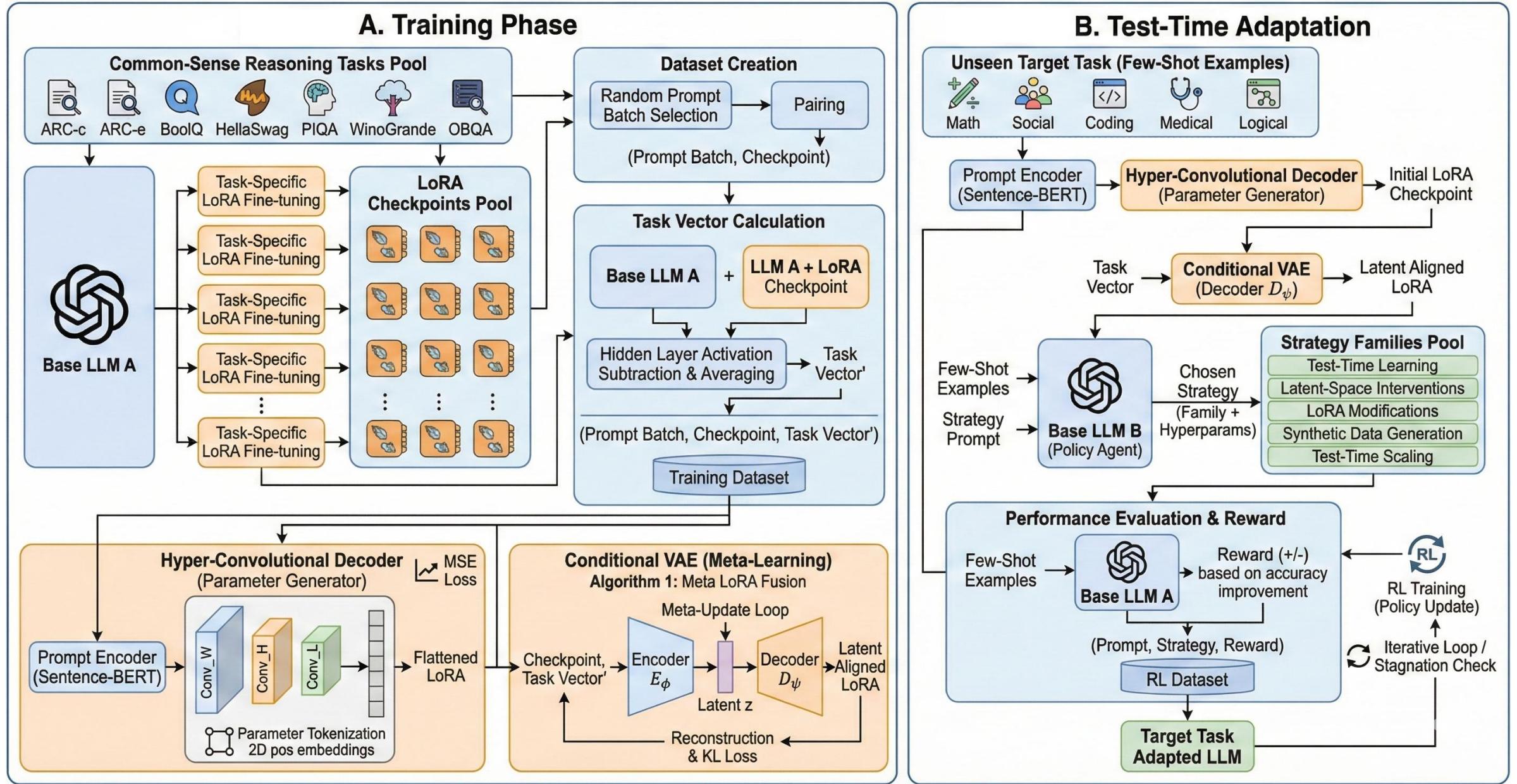
Streaming Continual Learning Bridge 2026

SOLUTION ?

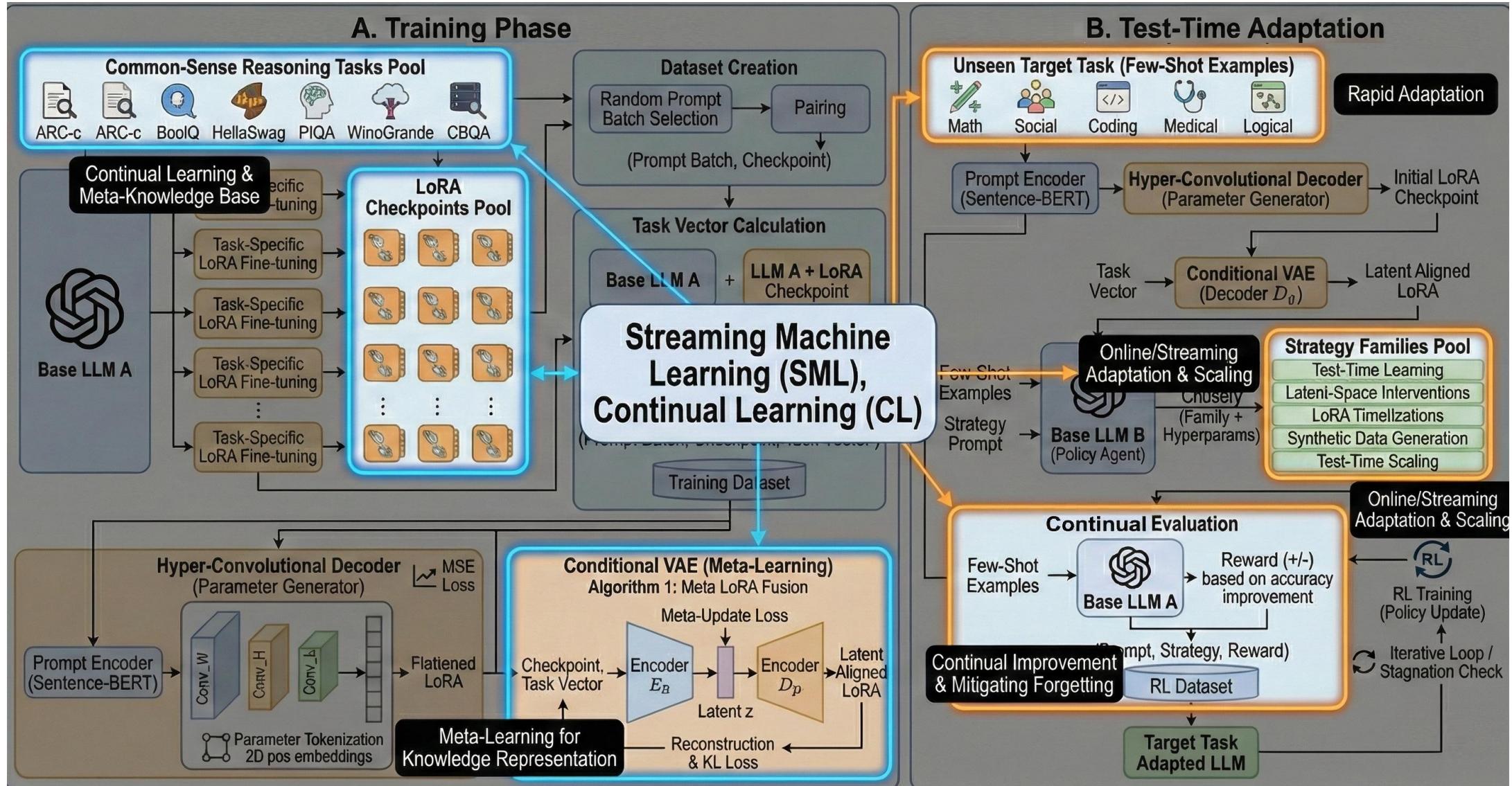


Approach taken by humans for **learning lifelong** and **continual adaptation** to unseen domains

SOLAR Methodology



Why SOLAR Works ?



SOLAR Results

Qwen2.5-0.5B-Instruct

Method	In-Domain Tasks						Out-of-Domain Tasks						
	ARC-e	ARC-c	BoolQ	Hella	PIQA	Avg	GSM	MATH	Logic	Social	Code	Med	Avg
LoRA	47.4	39.7	14.7	26.3	51.5	35.9	15.6	6.8	20.3	39.5	29.8	29.9	23.6
TTL	24.4	24.7	44.4	25.9	51.9	34.2	23.5	19.7	26.2	34.9	29.7	25.6	26.6
DOM	56.5	38.9	33.2	28.3	18.8	35.1	17.7	2.6	24.7	51.3	31.6	26.1	25.6
DnD	70.9	48.1	51.9	26.5	47.8	49.0	20.8	24.1	21.0	33.5	29.1	11.7	25.7
SOLAR	74.7	55.5	58.8	48.3	60.1	59.5	30.3	29.2	25.1	55.0	35.6	31.8	34.1

Qwen2.5-1.5B-Instruct

Method	In-Domain Tasks						Out-of-Domain Tasks						
	ARC-e	ARC-c	BoolQ	Hella	PIQA	Avg	GSM	MATH	Logic	Social	Code	Med	Avg
TTL	57.1	44.4	62.9	37.9	30.1	46.4	0.6	6.4	26.8	52.8	30.9	31.0	24.7
LoRA	62.8	54.4	47.9	44.2	41.1	50.1	34.2	32.2	24.1	51.4	34.7	36.1	35.4
DOM	83.9	70.7	55.7	51.8	43.9	61.2	53.1	38.5	27.7	65.6	43.1	40.8	44.8
DnD	83.7	73.0	55.2	56.2	56.4	64.9	32.6	40.1	28.6	68.6	44.1	39.5	42.2
SOLAR	88.4	73.7	58.7	57.2	70.7	69.8	51.4	46.9	31.2	69.5	44.6	41.5	47.6

THANK YOU

Any Questions ?



View the paper here and
connect

Nitin Vetcha

nitinvetcha@iisc.ac.in
ophv118@nus.edu.sg