Simulating Organized Group Behavior: New Framework, Benchmark, and Analysis

Xinkai Zou[1*] Yiming Huang[1*] Zhuohang Wu[2] Jian Sha[1] Nan Huang[1] Longfei Yun[3] Jingbo Shang[1†] Letian Peng[1†]

[1] University of California, San Diego [2] University of California, Irvine [3] Meta * Equal contribution † Corresponding authors Contact: jayzou@ucsd.edu

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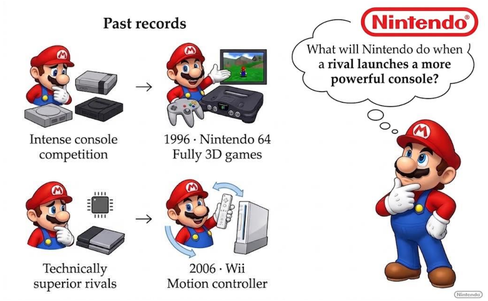
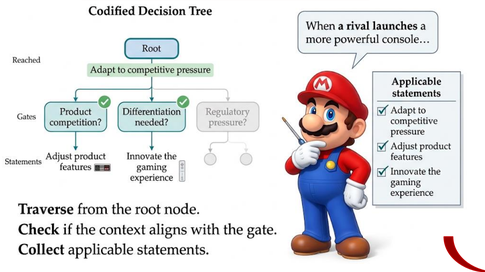
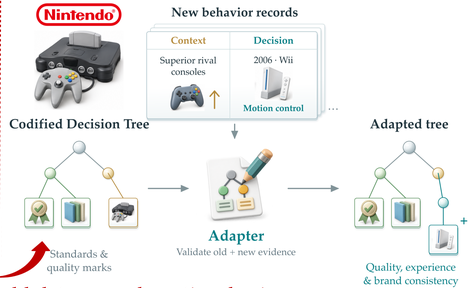
Project Page

Task: organized group behavior simulation



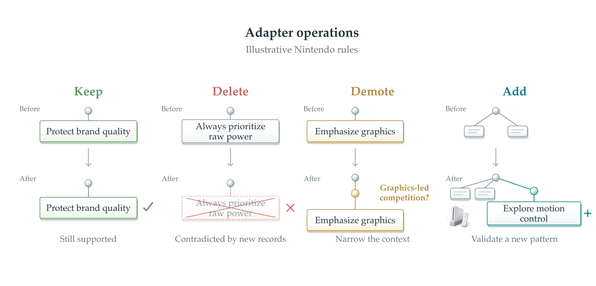
Codified Decision Tree

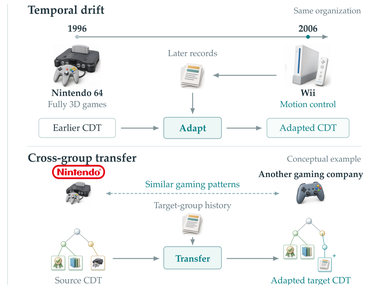




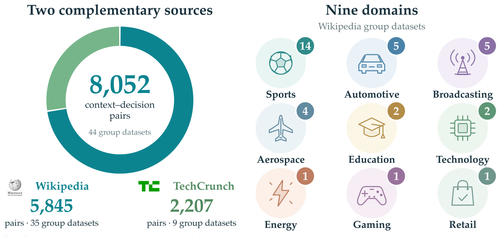
Q: Why Adapter? A: Real-world data spans long time horizons…

Adapter Mechanism

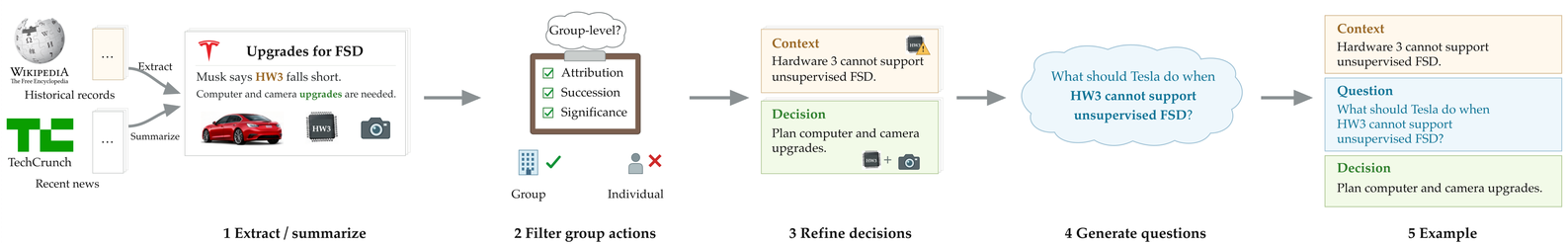




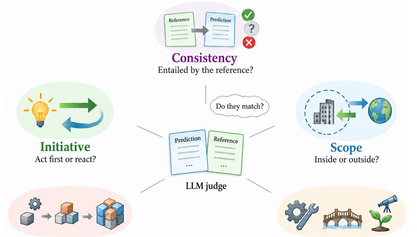
Benchmark Statistics



Benchmark Construction

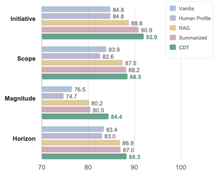


Evaluation Metrics



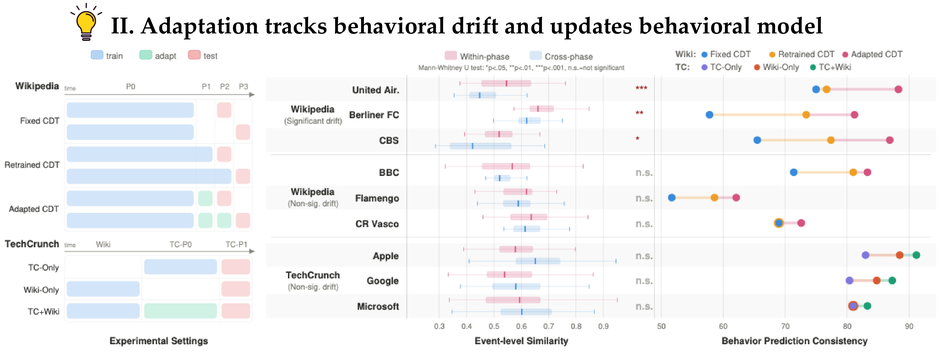
Experiments & Analysis

I. Structured representation (CDT) improves prediction

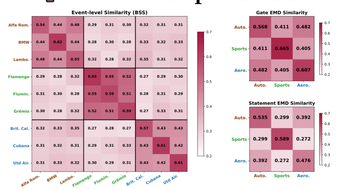


Method	Wikipedia Aero.	Auto.	Broad.	Edu.	Ener.	Game	Ret.	Spo.	Tech.	Avg	TC Avg
Vanilla	67.7	62.9	64.4	69.4	52.1	59.2	61.1	54.4	62.4	61.5	78.5
LoRA Finetuning	54.8	52.8	52.2	56.2	57.3	50.0	48.6	43.4	59.2	52.7	67.6
Human Profile	**70.7**	65.4	63.1	68.1	55.2	62.5	55.6	53.9	63.9	62.0	79.8
Summarized-based	69.8	62.9	66.2	68.1	68.8	**65.0**	59.7	58.3	64.9	64.9	79.0
RAG	67.3	62.5	64.4	66.0	60.4	59.2	55.6	55.2	67.5	62.0	84.2
Ours (CDT)	70.0	**69.1**	**68.5**	**70.8**	**74.0**	**65.0**	**66.7**	**64.5**	**70.1**	**68.7**	**85.7**
Temporal Adaptation Study evaluation on P2 & P3											
Fixed CDT	70.2	65.0	69.0	67.7	75.0	62.5	**66.7**	65.2	**75.8**	68.6	–
Retrained CDT	71.2	67.5	73.4	66.7	73.4	62.5	54.2	66.7	67.2	67.0	–
Adapted CDT	**76.0**	**68.3**	**77.2**	**75.0**	**78.1**	**72.5**	64.6	**68.8**	68.8	**72.1**	–

II. Adaptation tracks behavioral drift and updates behavioral model



III. Shared patterns enable behavior transfer



Domain	Source	Target	Vanilla	Tgt CDT	Transfer
Aero.	Brit. Cal.	Airbus	75.0	61.4	**83.3**
Auto.	Volkswagen	Ford	73.8	66.7	**76.2**
Spo.	Flumin.	Derry City	65.0	71.7	**80.0**
	SE.Palmeiras	GELP	66.7	64.6	**68.8**
Edu.	Cornell	Princeton	65.4	76.9	**84.6**
	Cornell	UPenn	53.3	60.0	**63.3**
	Cornell	Stanford	79.4	70.6	**82.4**
	GaTech	UCLA	62.5	62.5	**70.0**

Case Studies

(left: temporal behavior drift; right: group pattern transfer)

