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laitifranz.github.io/MemCoach

How to Take a Memorable Picture? Empowering Users with Actionable Feedback

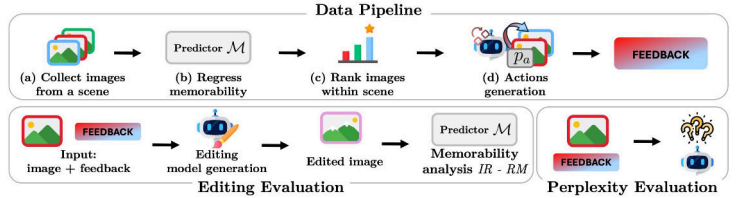
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Provide natural-language **feedback** from a single input photo, **guiding users toward more memorable shots** via memorability-aware suggestions!



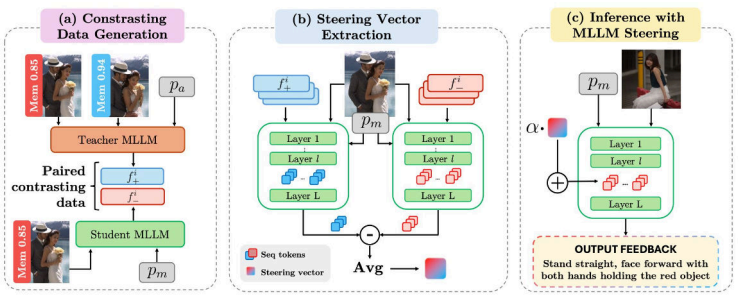
MemBench



Overview of MemBench generation and evaluation.

- **Top:** Data pipeline for constructing MemBench, including scene grouping, memorability regression, image ranking, and generation of actionable memorability-aware feedback.
- **Bottom:** Evaluation pipeline assessing feedback quality through editing-based memorability improvement and perplexity scoring.

Method



- (a) **Contrasting data generation:** paired samples are built by coupling the memorability-aware guidance of a teacher MLLM with the neutral responses of a student MLLM on the same scene.
- (b) **Steering vector extraction:** activation differences between memorability and neutral feedback are averaged to obtain a memorability steering vector capturing the latent shift toward effective suggestions for memorability.
- (c) **Inference with MLLM steering:** the student activations are shifted using the memorability steering vector to produce improved, memorability-oriented feedback without additional training.

Motivation

Verbalize what makes memorable

Passive & Opaque Paradigms

- **Prediction is not guidance:** Scalar memorability scores do not tell users how to improve a photo.
- **Editing removes control:** Automatic edits via generative models optimize memorability but obscure the underlying rationale and limit user control.

Lack Memorability Understanding

- **Humans misjudge memorability:** We, as human, generally fail to judge what is memorable.
- **MLLMs exhibit no correlation with human annotations:** SoTA models fail to capture human memorability patterns and provide unreliable feedback for improving memorability.

Contributions

Four main contributions

- 1 **Memorability as guidance:** First work to formalize Memorability Feedback (*MemFeed*) as actionable, capture-time coaching, shifting from scalar prediction to interactive visual guidance.
- 2 **MemCoach framework:** Training-free teacher-student activation steering with a contrastive strategy to inject memorability-aware behavior into MLLMs.
- 3 **MemBench + evaluation:** Introduces MemBench and a protocol combining editing-based memorability gains with perplexity-based feedback alignment.
- 4 **Empirical gains:** Consistent improvements across InternVL, Qwen, HF Idefics3, and LLaVA.

Experiments

Qualitative Results

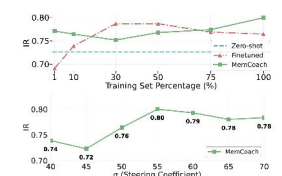


Qualitative feedback from MemCoach. For each source image (left), the model provides natural-language feedback (bottom) that is applied to produce the destination image (right). Each score represents the Relative Memorability (RM), indicating how suggested feedback affects memorability. MemCoach provides human-interpretable and actionable feedback that translates into semantic changes for overall improved memorability.

Quantitative Results

Model	Editing		Perplexity (↓)
	IR (↑)	RM% (↑)	
<i>Edit model</i>	0.68	3.72	<i>n.d.</i>
<i>Teacher oracles</i>			
LLaVA-OV [2]	0.74	5.93	5.73
Idefics3 [33]	0.80	9.84	29.21
QWEN2.5VL [4]	0.83	10.16	2.34
INTERNVL3.5 [58]	0.85	11.92	2.40
<i>Aesthetics specialized</i>			
AESEXPERT [20]	0.73	6.67	5.97
Q-INSTRUCT [60]	0.73	5.31	5.36
<i>Zero-shot baselines</i>			
GPT-5 MINI [43]	0.75	7.03	<i>n.d.</i>
LLaVA-OV [2]	0.70	5.87	7.58
Idefics3 [33]	0.73	6.64	20.19
QWEN2.5VL [4]	0.68	4.26	10.23
INTERNVL3.5 [58]	0.73	5.47	5.49
MemCoach (Ours)	0.80	7.21	4.99

Model	Editing		Perplexity (↓)
	IR (↑)	RM% (↑)	
LLaVA-OV [2]	0.70	5.87	7.58
MemCoach-LLaVA	0.73 (+4.29%)	5.04 (+14.14%)	14.05 (+85.56%)
Idefics3 [33]	0.73	6.64	20.19
MemCoach-Idefics	0.75 (+2.74%)	6.69 (+0.75%)	19.81 (-1.88%)
QWEN2.5VL [4]	0.68	4.26	10.23
MemCoach-QWEN	0.74 (+8.82%)	5.49 (+28.87%)	13.90 (+35.87%)
INTERNVL3.5 [58]	0.73	5.47	5.49
MemCoach-INTERNVL	0.80 (+9.59%)	7.21 (+31.81%)	4.99 (-9.11%)



Comparison with state-of-the-art models. Best results in bold.