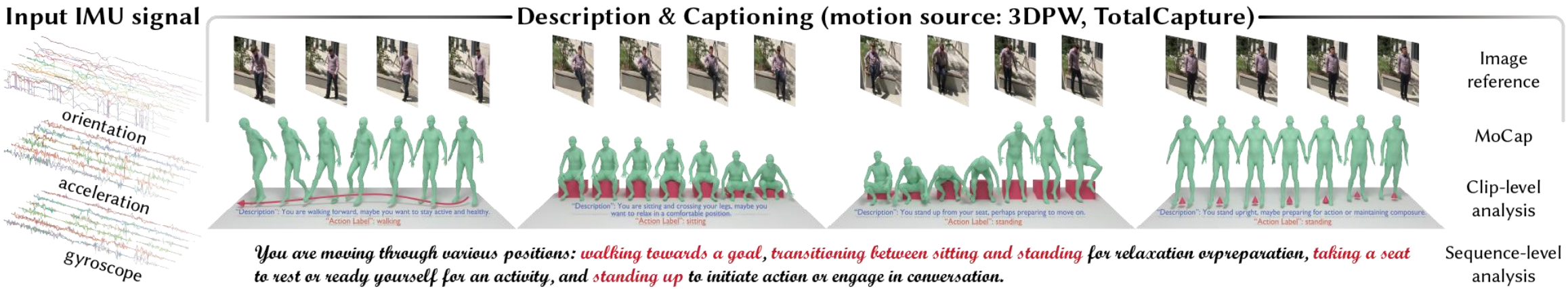
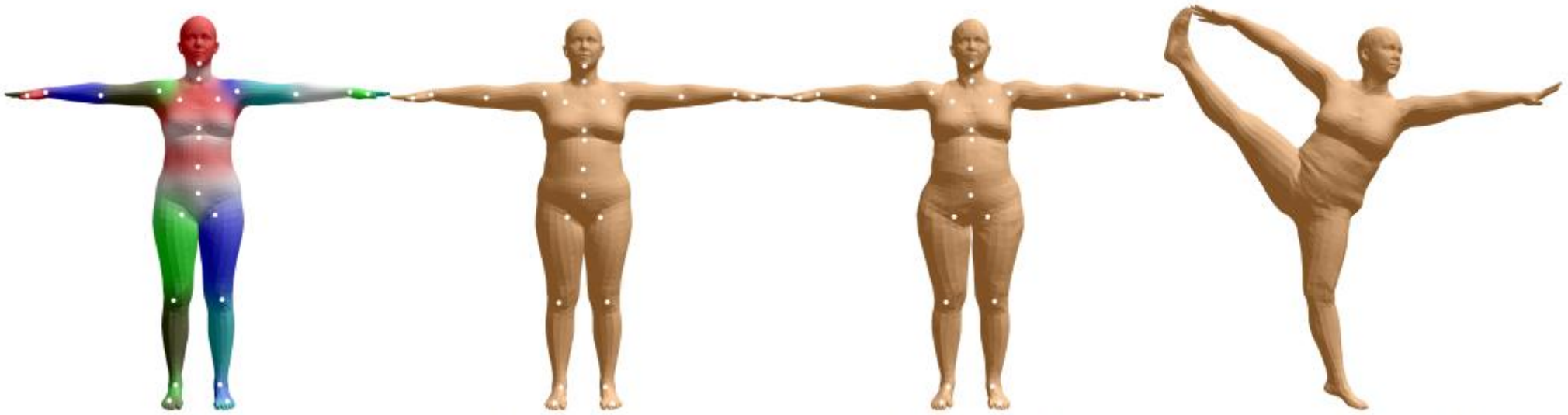
Mojito: LLM-Aided Motion Instructor with Jitter-Reduced Inertial Tokens



- 通过IMU重建人体动作
- 使用比较轻量化的IMU信号, 让LLM理解人类动作

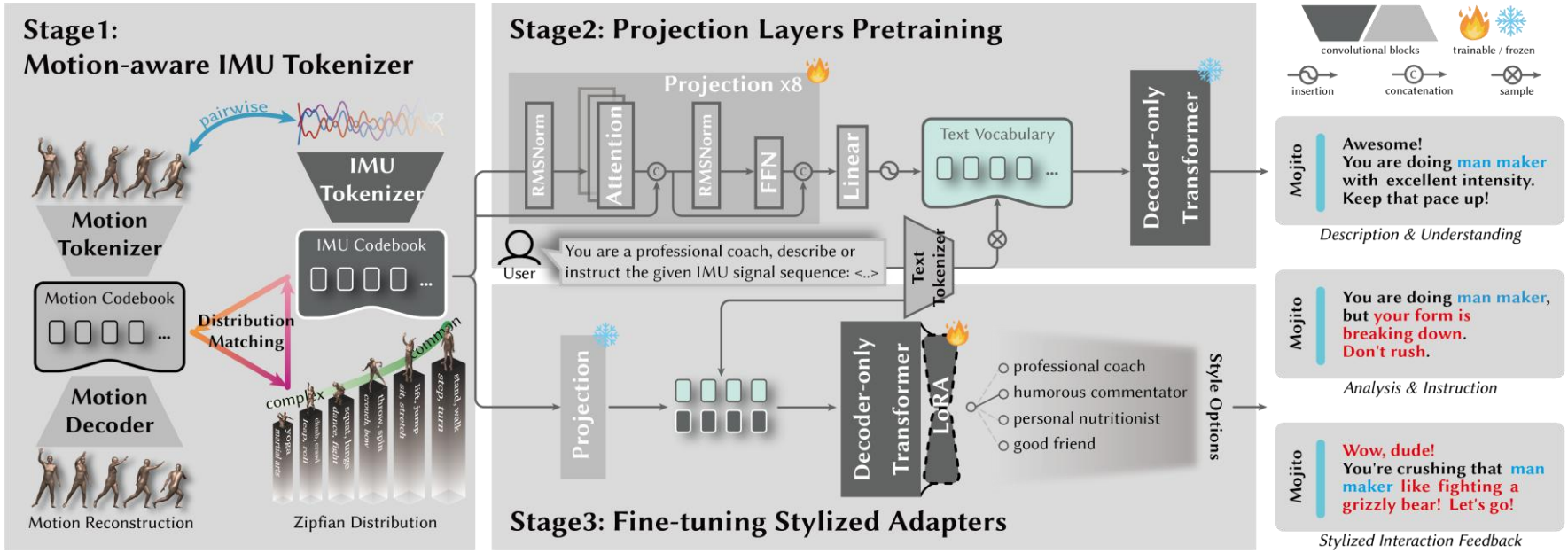
Mojito: LLM-Aided Motion Instructor with Jitter-Reduced Inertial Tokens



- SMPL: A Skinned Multi-Person Linear Model

- root pos, root rot, joint rot

Mojito: LLM-Aided Motion Instructor with Jitter-Reduced Inertial Tokens



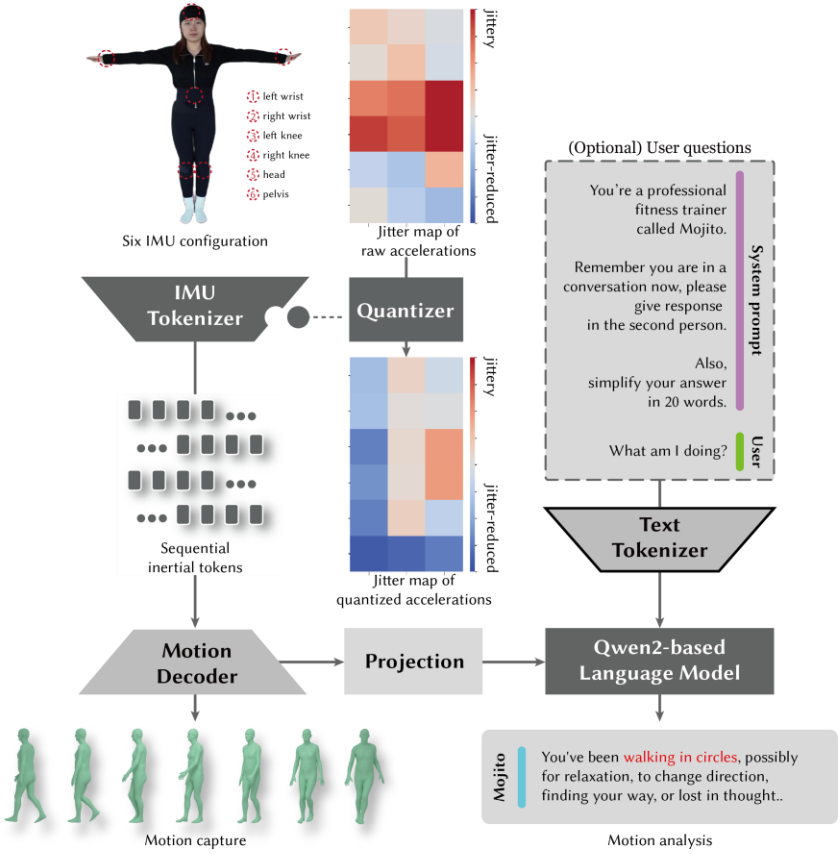
- motion repr: $\mathbf{M}^{1:T} = [\mathbf{r} \quad \dot{\mathbf{r}} \quad \mathbf{\Phi} \quad \dot{\mathbf{\Phi}} \quad \mathbf{j}^r \quad \mathbf{j}^p \quad \mathbf{j}^v \quad \mathbf{p}] \in \mathbb{R}^{T \times d_m}$
- imu repr: $\mathbf{I}^{1:T} = [\mathbf{q} \quad \mathbf{a} \quad \boldsymbol{\omega}] \in \mathbb{R}^{T \times d_u}$

Mojito: LLM-Aided Motion Instructor with Jitter-Reduced Inertial Tokens

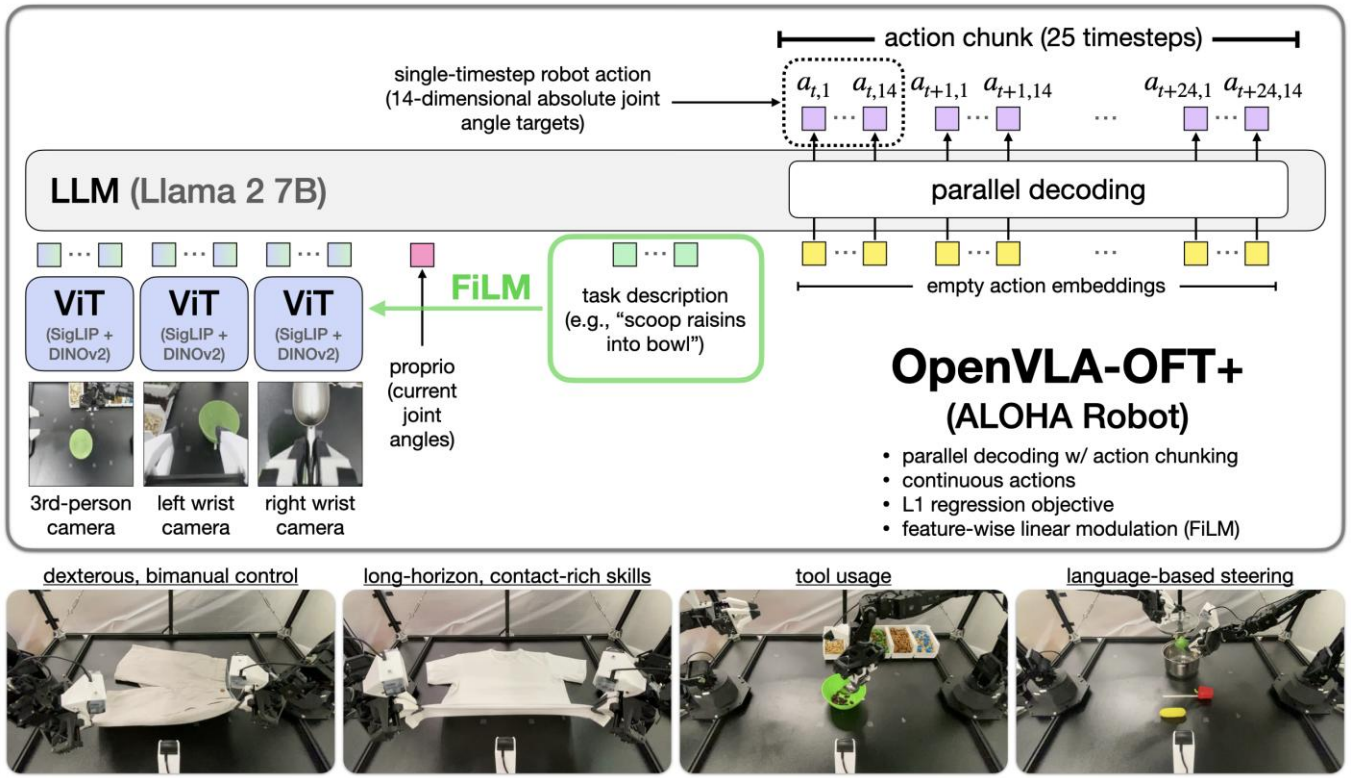
- inference:

- imu signal -tokenizer-> token -projector-> embedding vector
- language instruction -tokenizer-> embedding vector

- embedding vector -LLM-> auto-regressive output



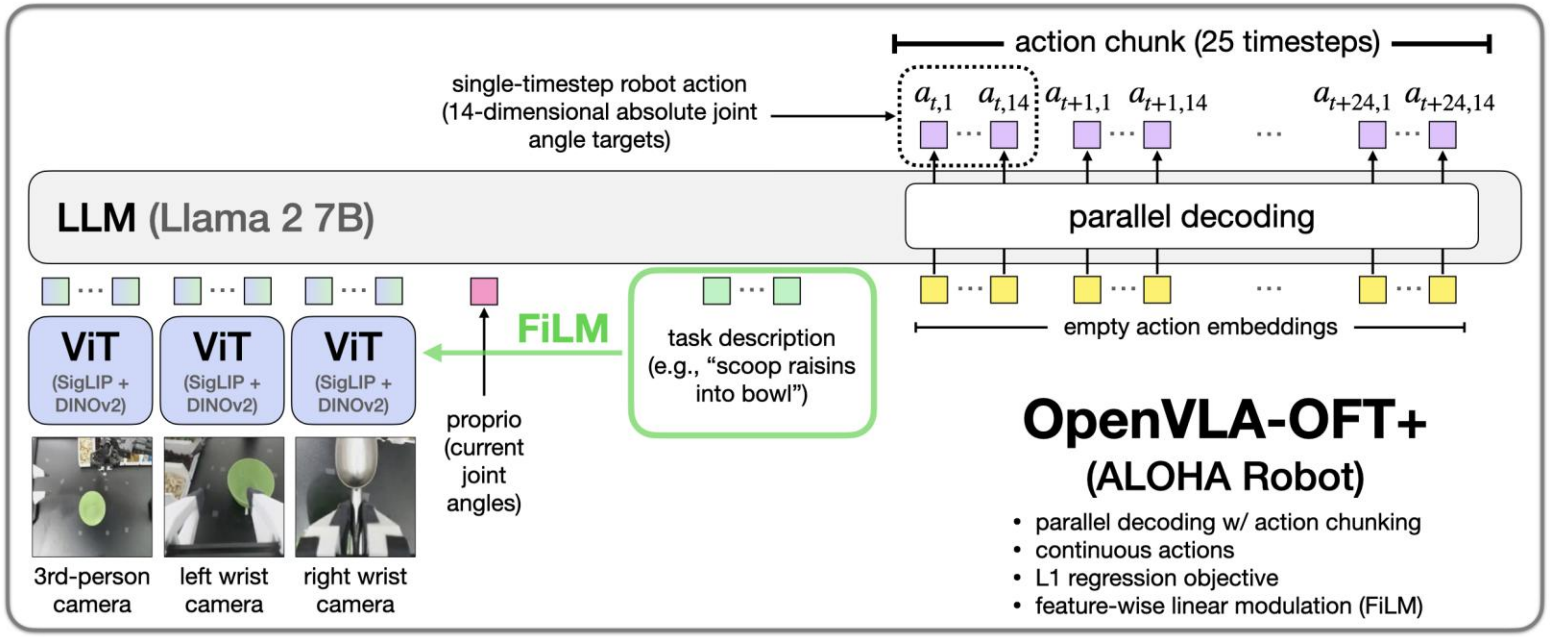
Fine-Tuning Vision-Language-Action Models: Optimizing Speed and Success



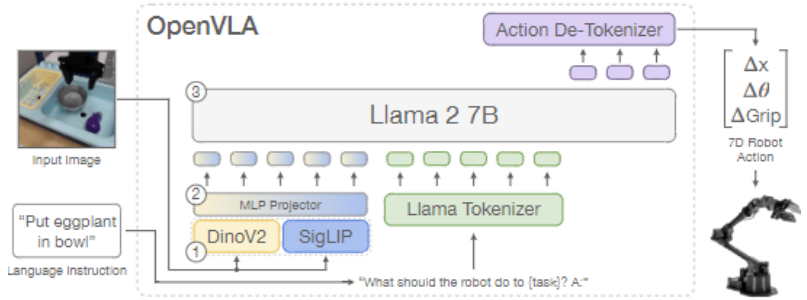
- publish: NeurIPS 2024

- 相较于OpenVLA, 推理速度更快, 在双臂机器人上表现更好

Fine-Tuning Vision-Language-Action Models: Optimizing Speed and Success

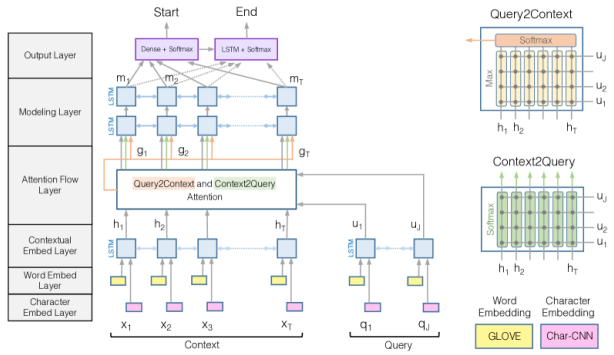


- 与OpenVLA的区别:
  - 使用并行解码
  - 使用连续的action space
  - 使用FiLM对图片文本进行加强

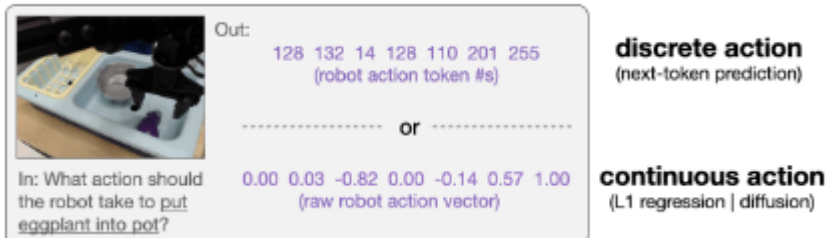


Fine-Tuning Vision-Language-Action Models: Optimizing Speed and Success

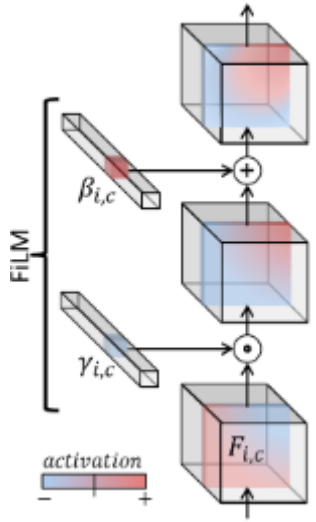
- 并行解码: bi-directional attention



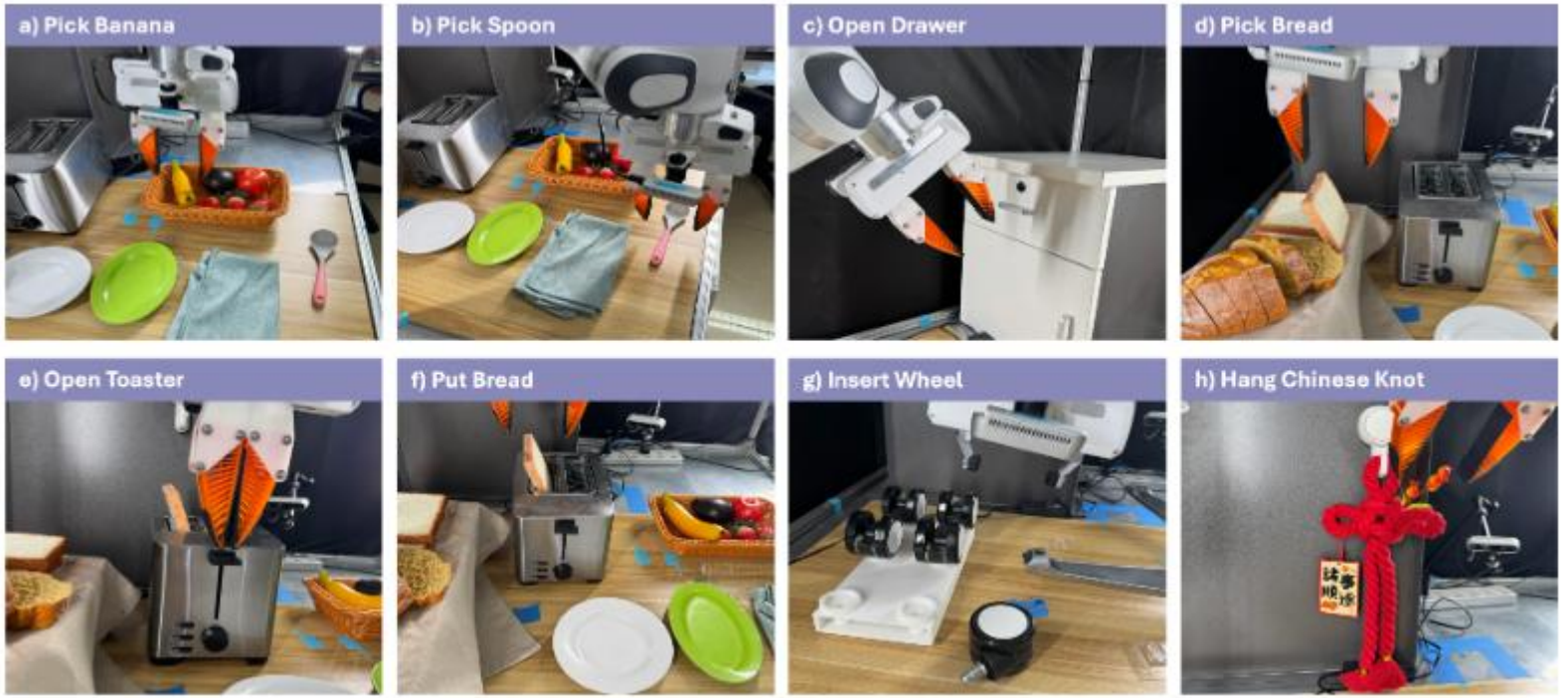
- continuous action: L1 regression或者diffusion policy



- FiLM: 文本结合图片 $\mathbf{FiLM}(\mathbf{F}|\gamma,\beta) = \hat{\mathbf{F}} = (1+\gamma)\odot\mathbf{F}+\beta$



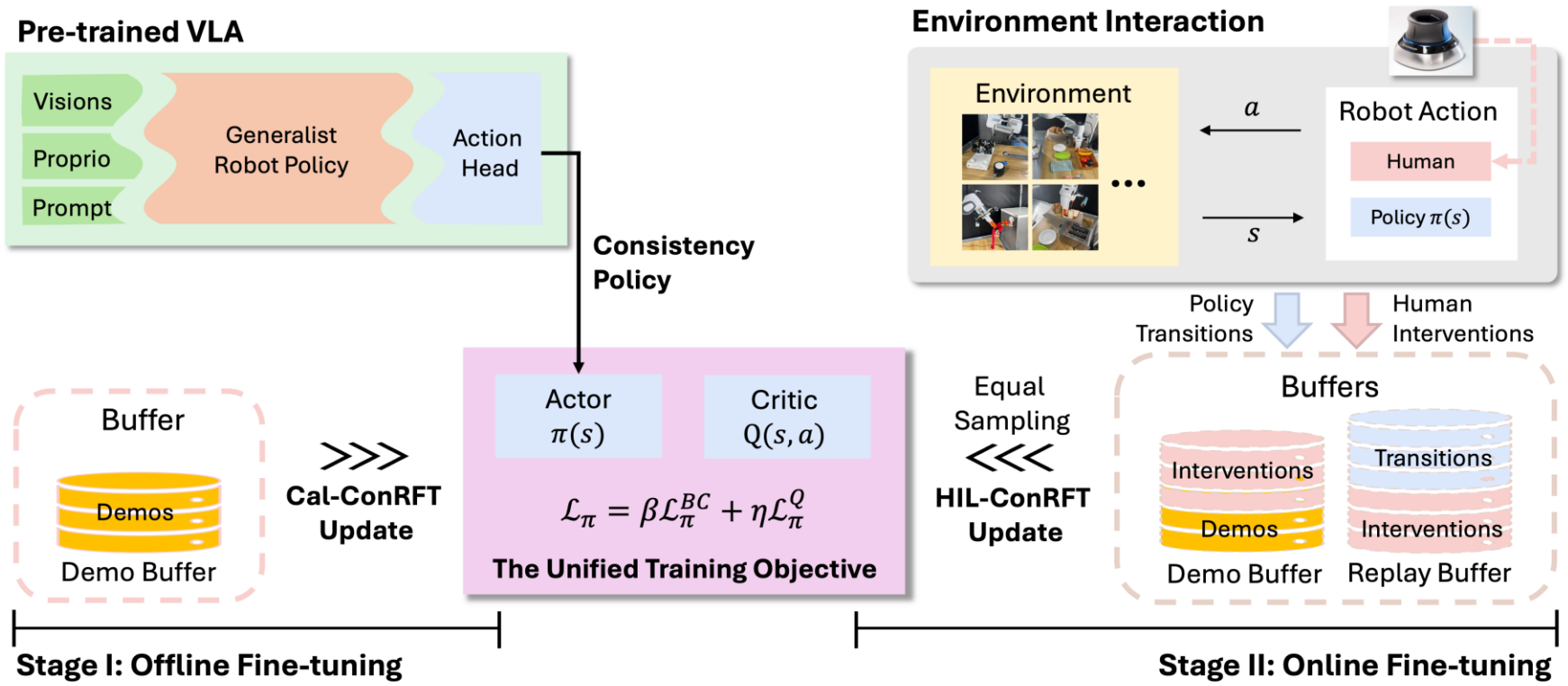
ConRFT: A Reinforced Fine-tuning Method for VLA Models via Consistency Policy



- publish: RSS 2025

- 使用consistency policy进行fine-tuning VLA

ConRFT: A Reinforced Fine-tuning Method for VLA Models via Consistency Policy



- consistency policy: 使用Q-value作为指导, 训练policy
- loss: $\mathcal{L}_\pi^{\mathrm{BC}} = \mathbb{E}_{(s,a)\sim(D\cup R),m\sim\mathcal{U}[1,M-1]}[d(f_\psi(a+k_m z, k_m|E(s)), a)]$ $\mathcal{L}_\pi^{\mathrm{Q}} = -\mathbb{E}_{s\sim(D\cup R)}[Q(s,a)]$
- 使用Behavior Clone做offline训练, 然后在此基础上进行online训练(HIL)