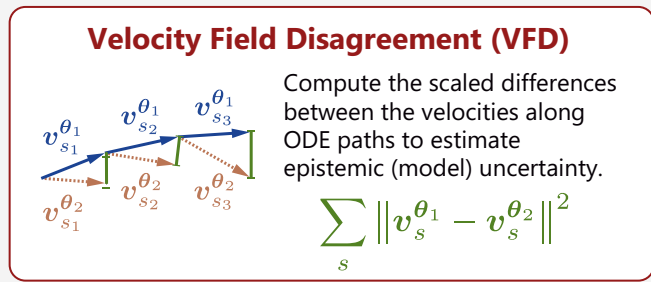
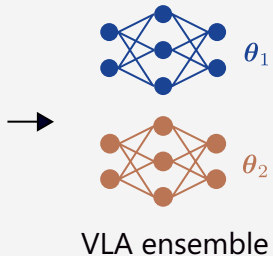
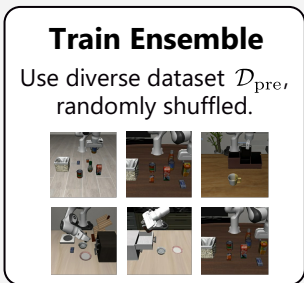
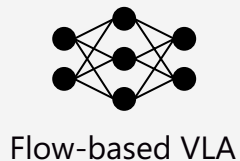


Epistemic Uncertainty Estimation for VLAs



Uncertainty-Guided Active Multitask Fine-Tuning

New Tasks

"Put both the alphabet soup and the tomato sauce in the basket."

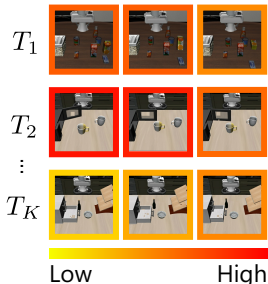
"Put the black bowl in the bottom drawer of the cabinet and close it."

"Put the yellow and white mug in the microwave and close it."



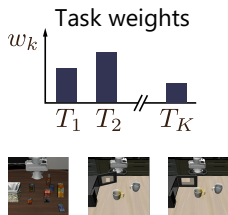
Estimate Uncertainty

For all candidate tasks, compute **VFD uncertainties**.



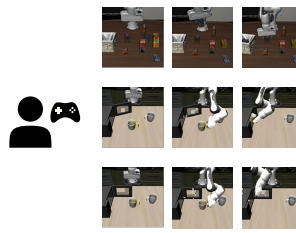
Selection

Prioritize most uncertain tasks and select top-K episodes.



Query Expert

Collect episodes starting from selected initial states.



Expert Demonstrations

Fine-Tuning

Replay \mathcal{D}_{pre} to ensure ensemble diversity.



Repeat for R rounds