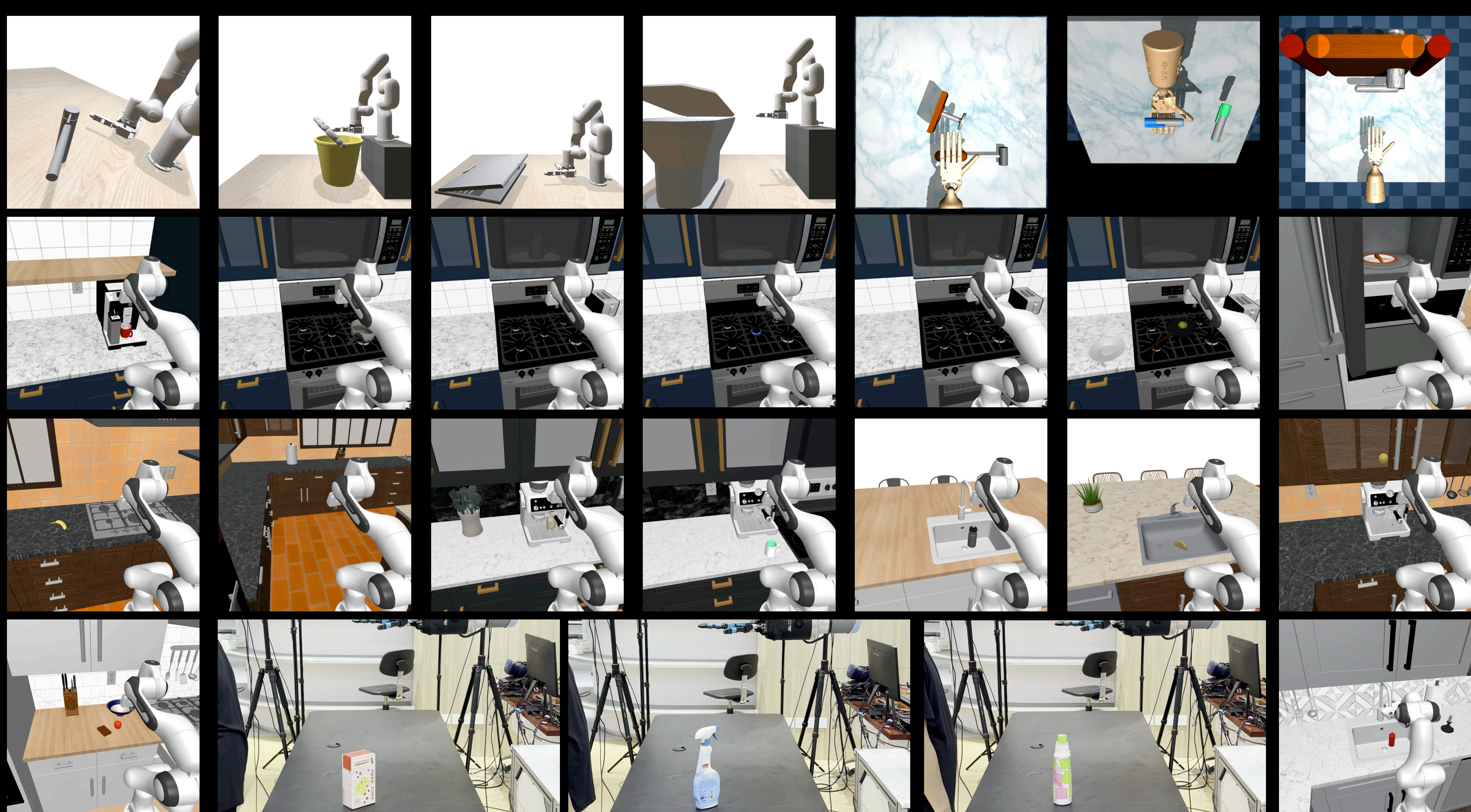




FreqPolicy:

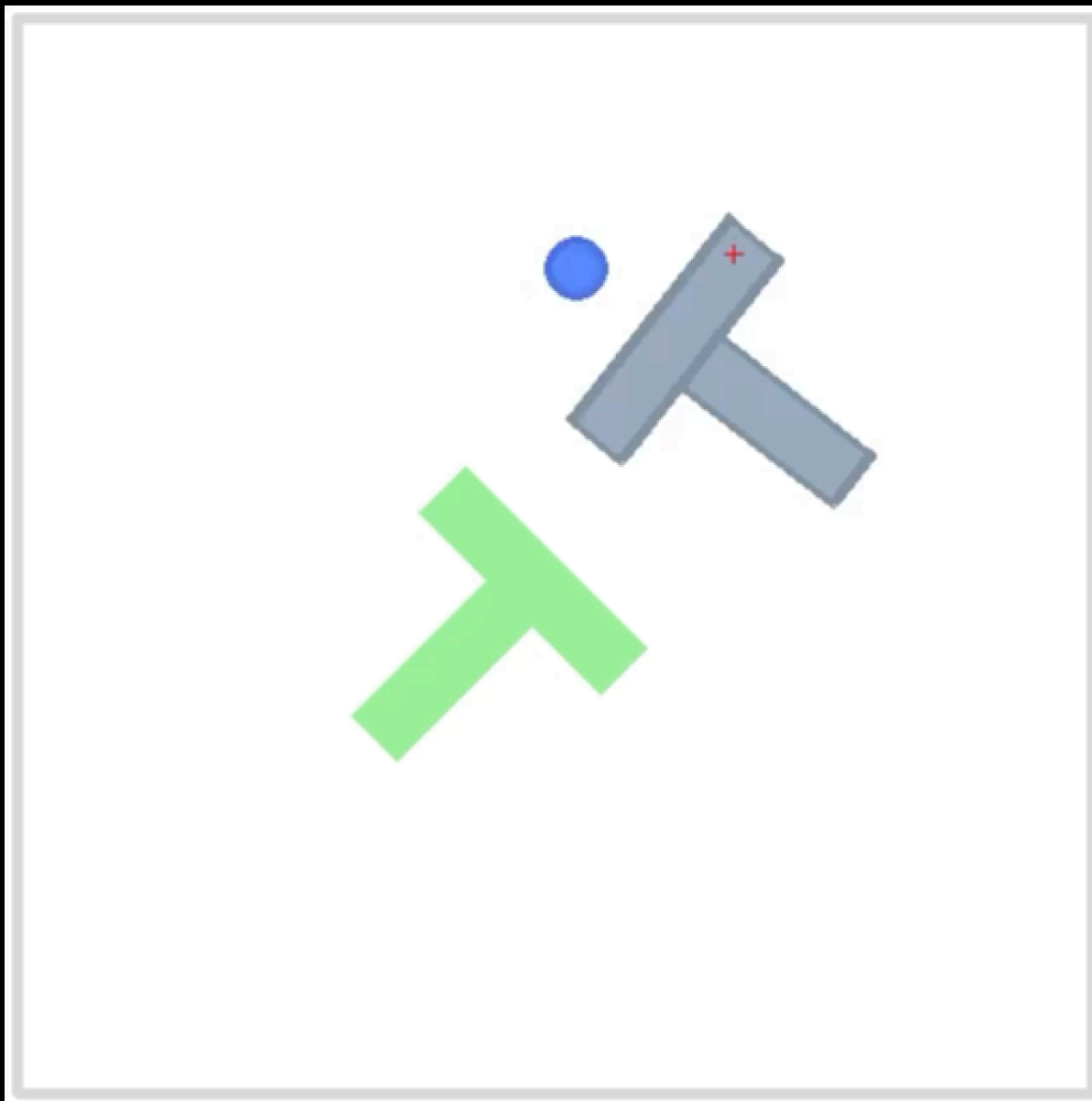
Frequency Autoregressive Visuomotor
Policy with Continuous Tokens



Motivation

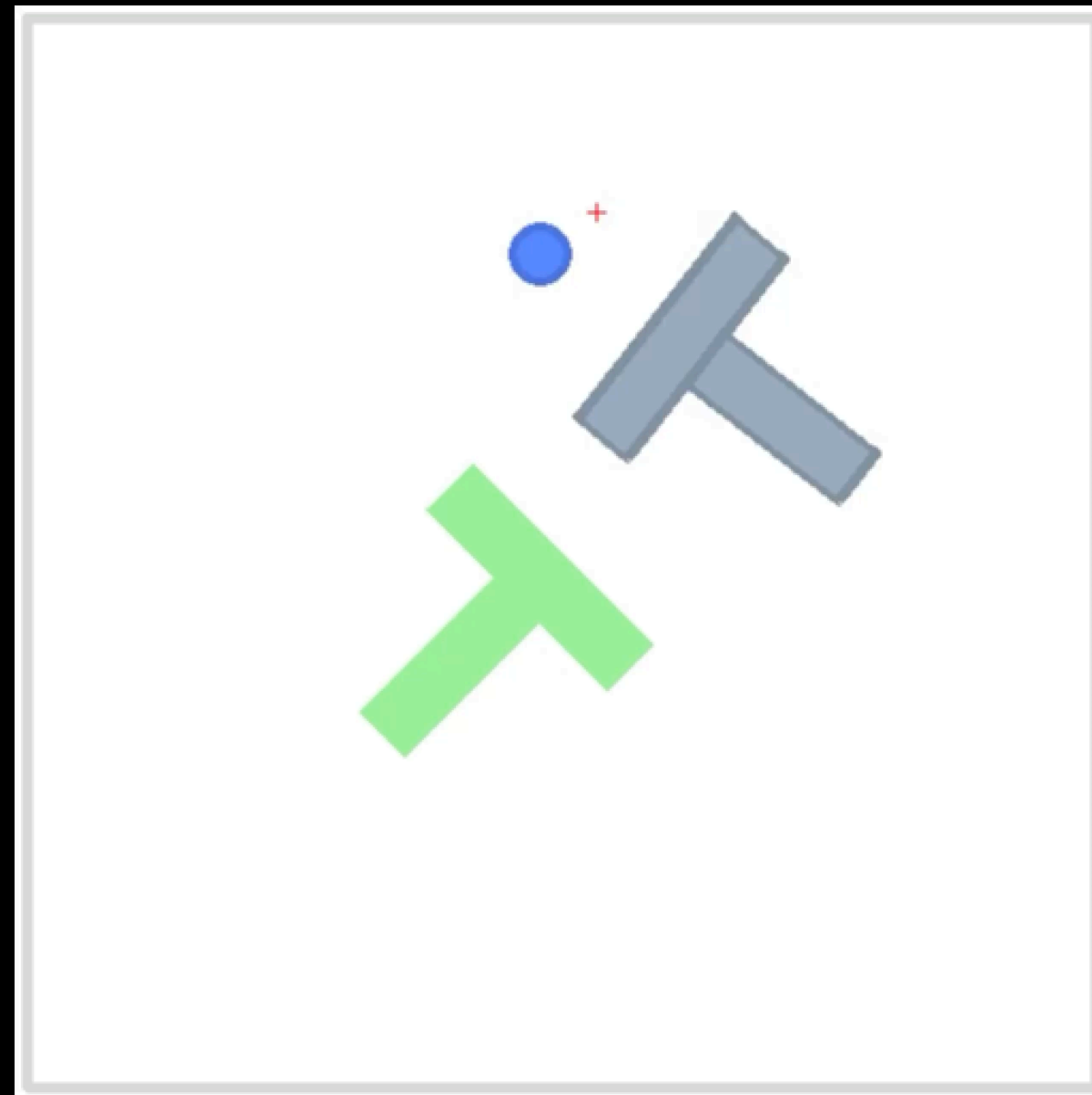
Representation of Action Space

10% Frequency



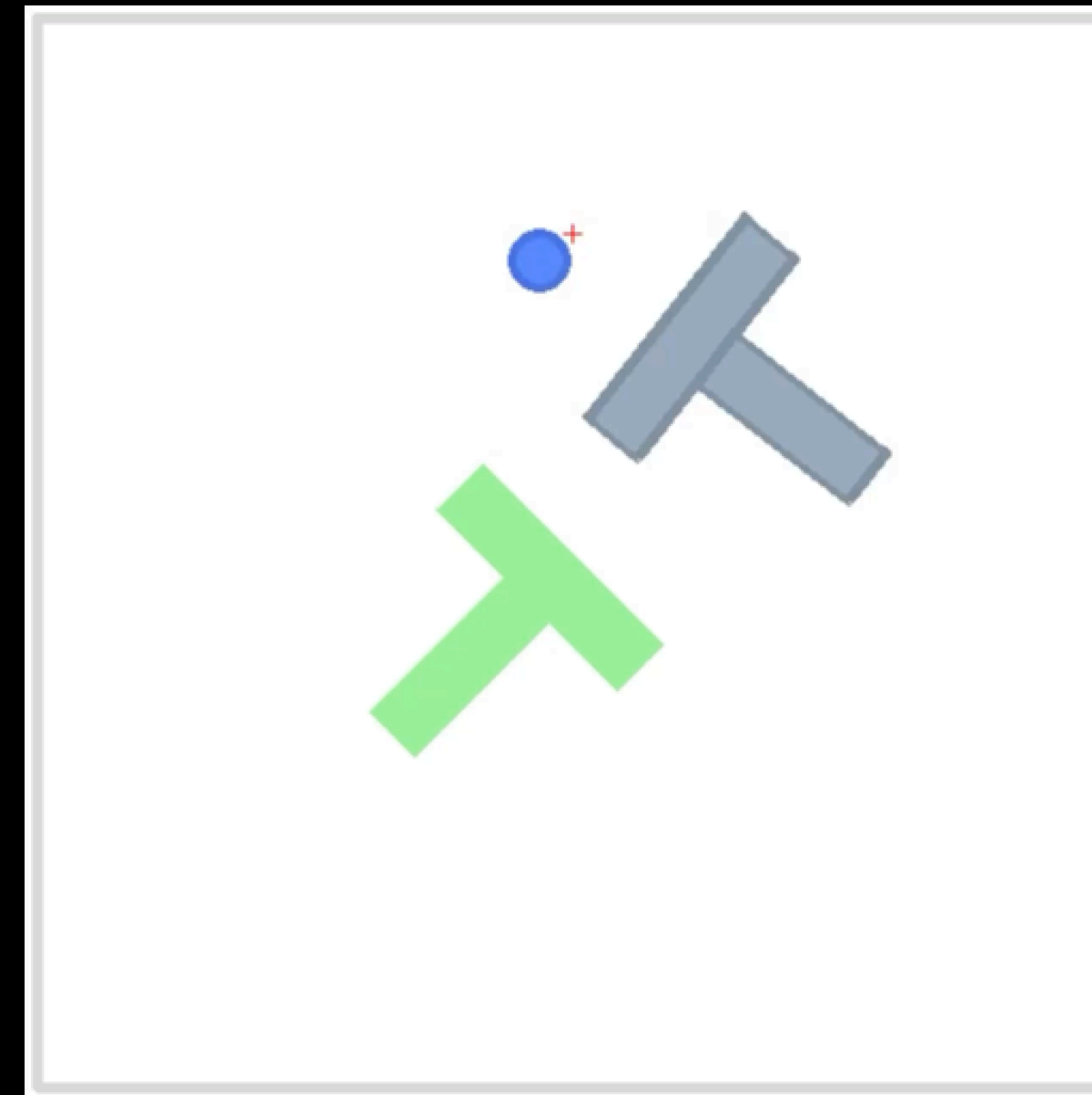
43% Success

20% Frequency



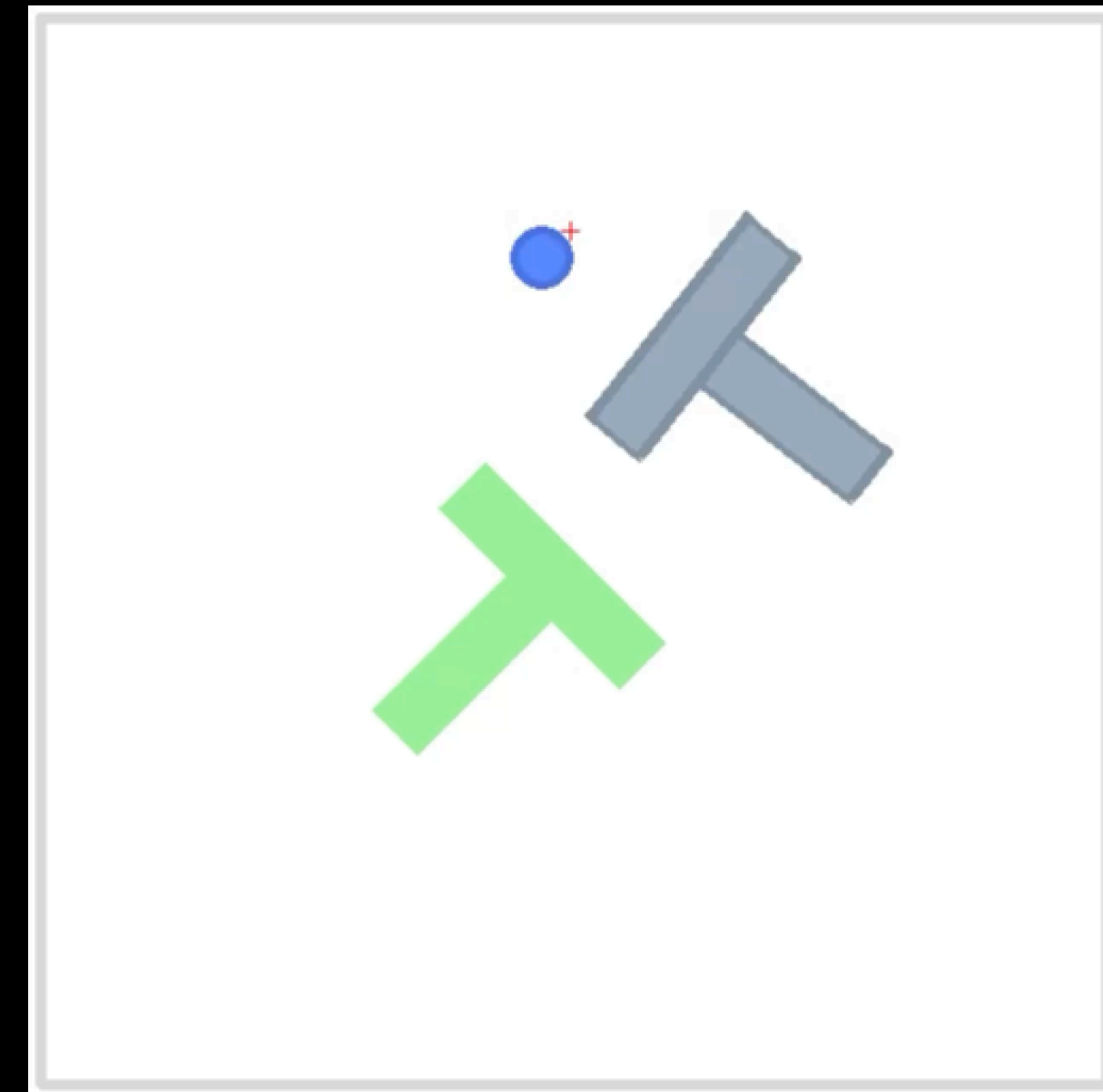
70% Success

50% Frequency



87% Success

100% Frequency



85% Success

Low-Dimensional Action Space ($D = 2$)

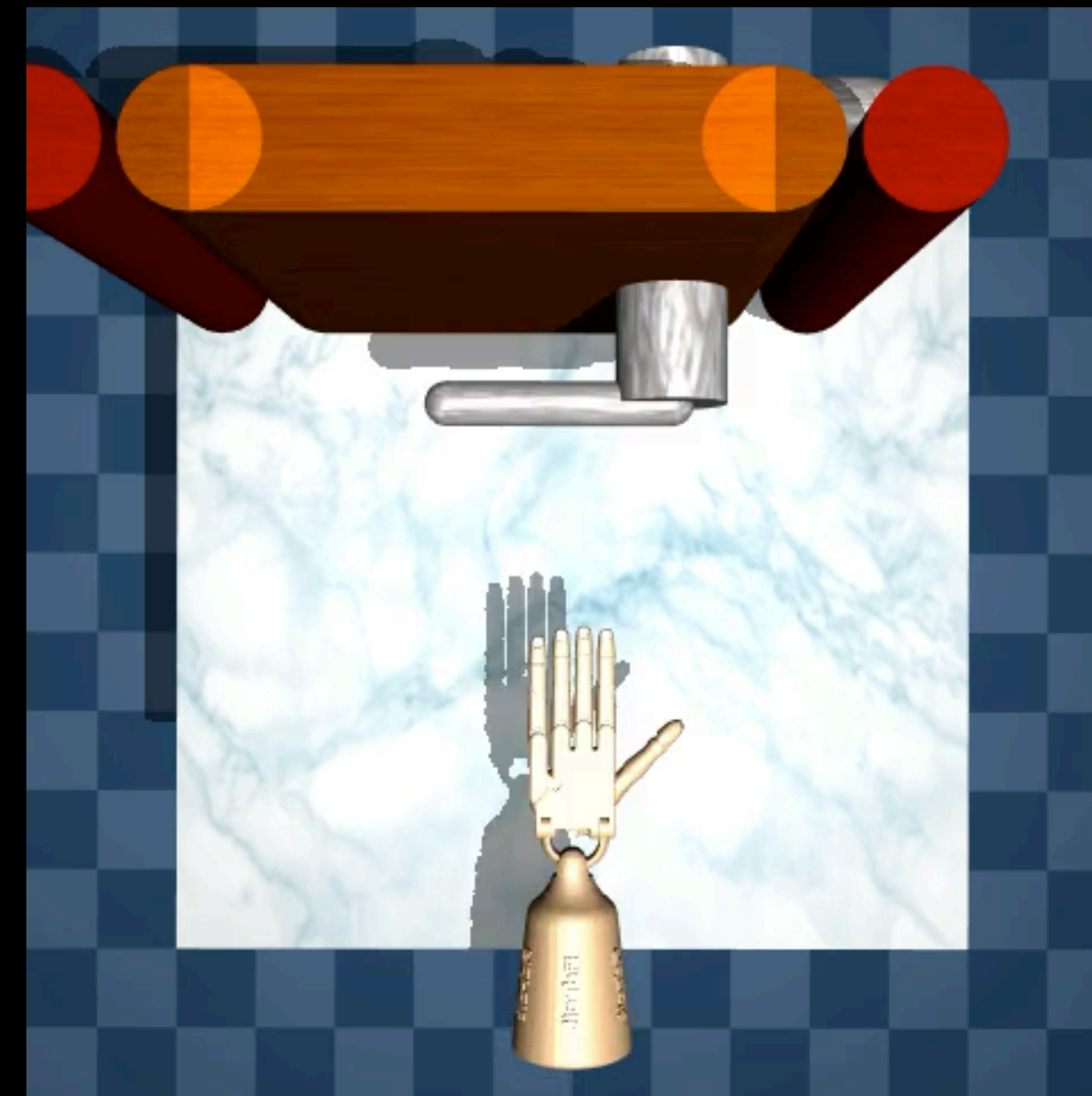
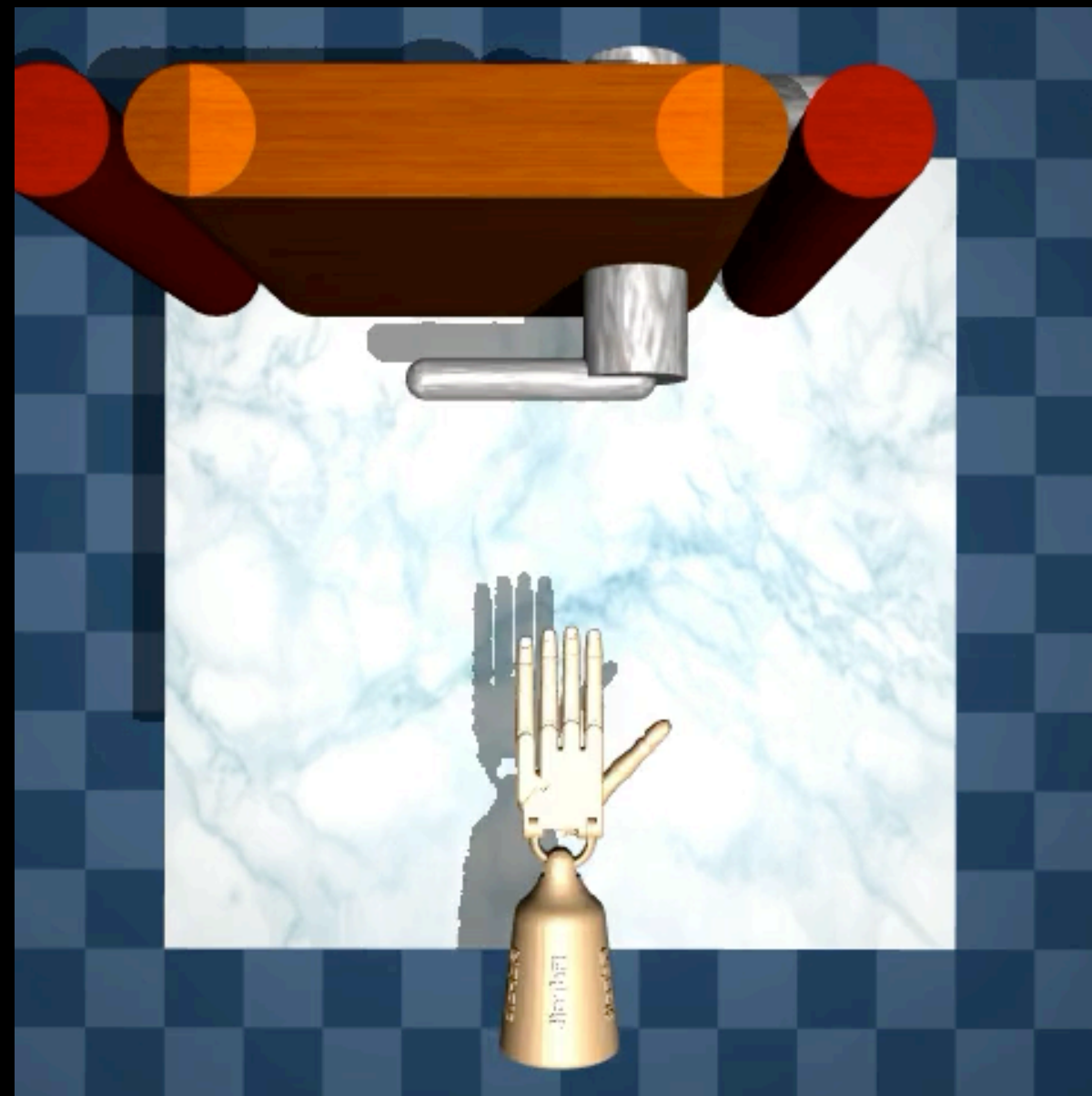
Representation of Action Space

10% Frequency

20% Frequency

50% Frequency

100% Frequency



0% Success

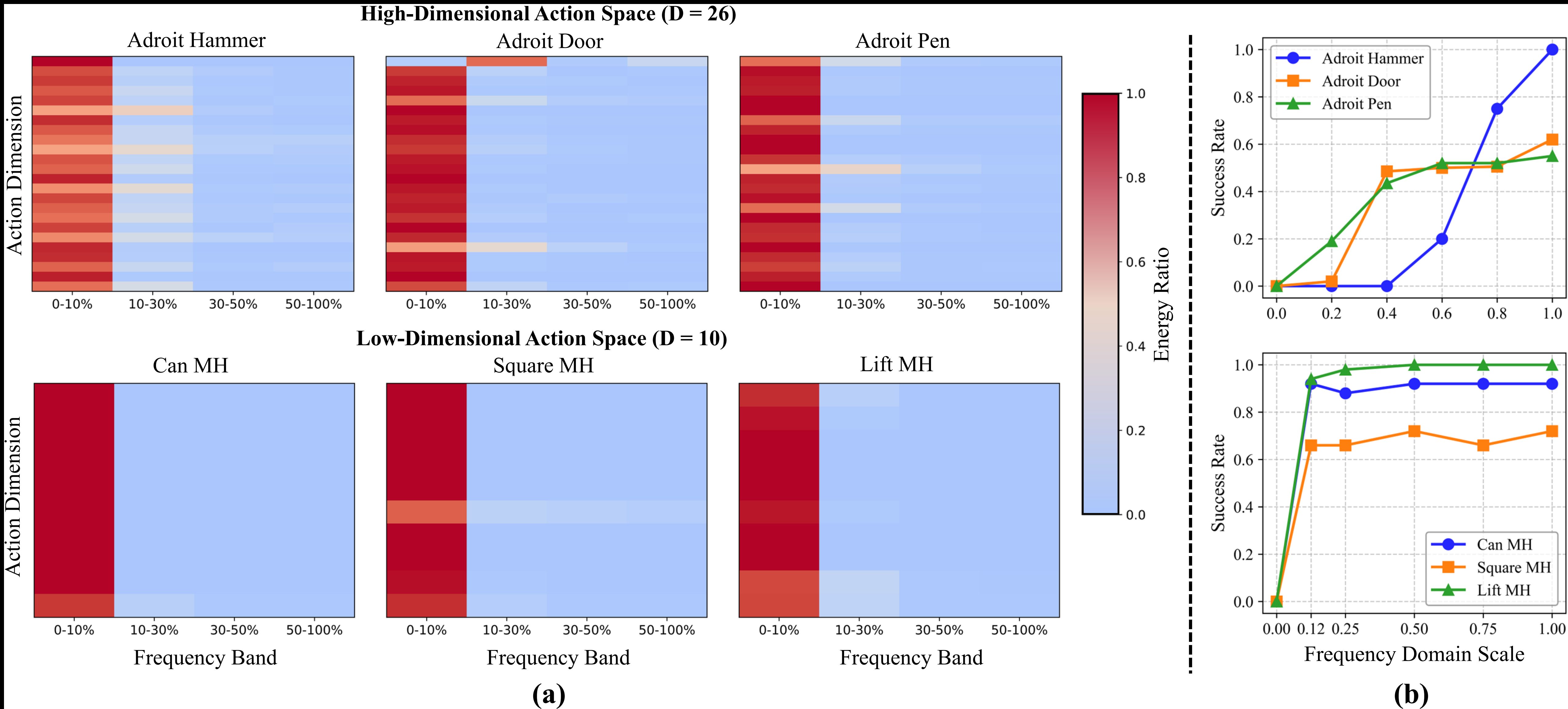
2% Success

51% Success

65% Success

High-Dimensional Action Space ($D = 26$)

Representation of Action Space



Continuous vs Discrete

BET(Discrete)



CARP(Discrete)



Ours(Continuous)



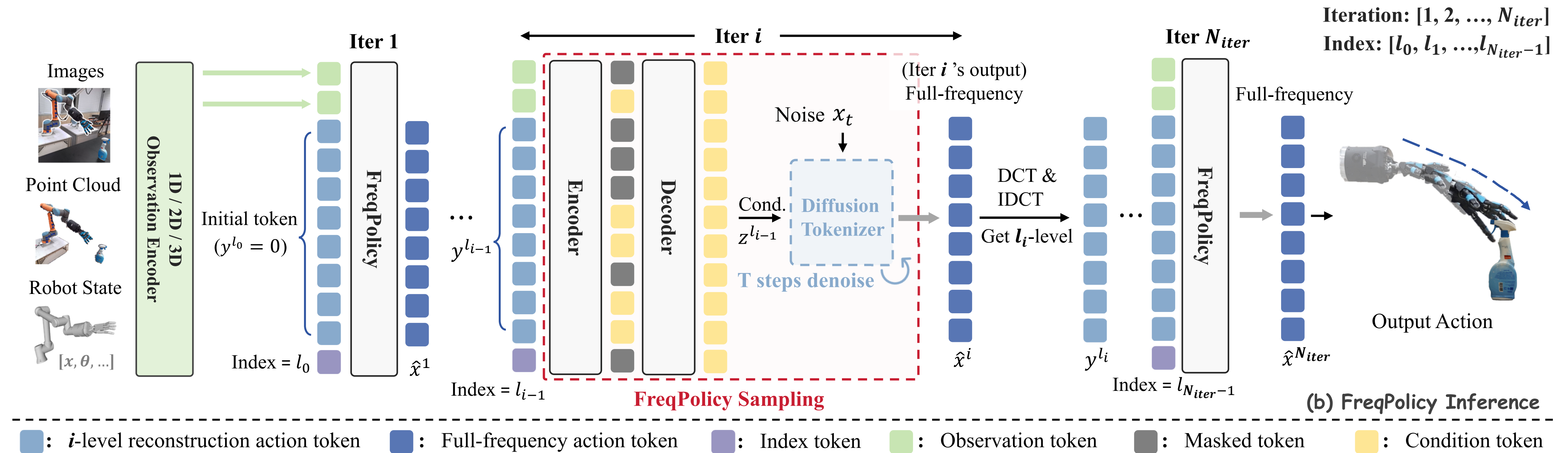
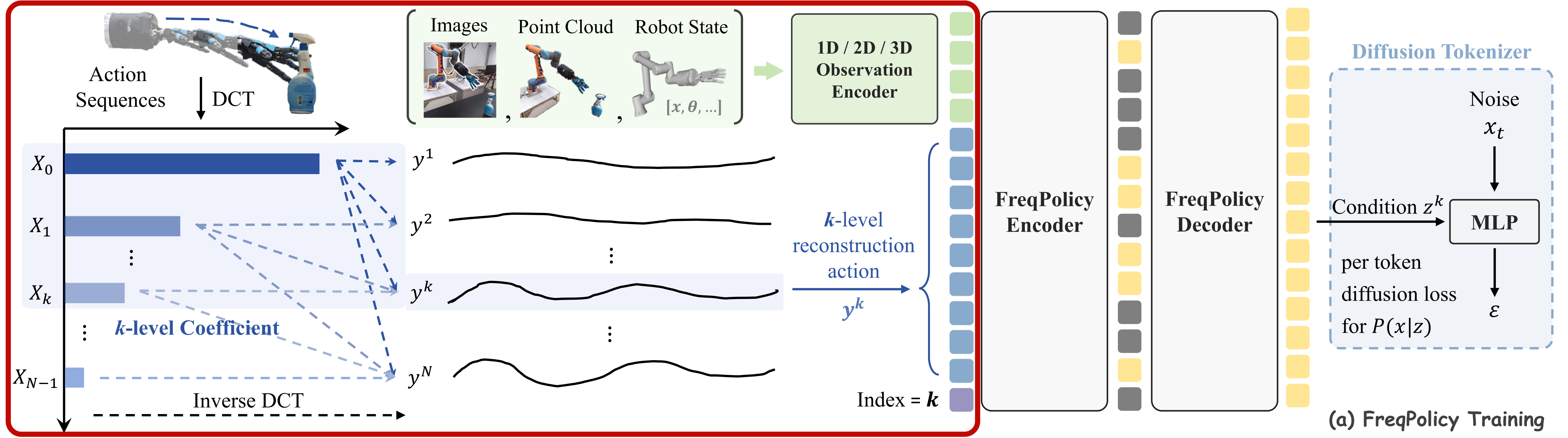
DP(Continuous)

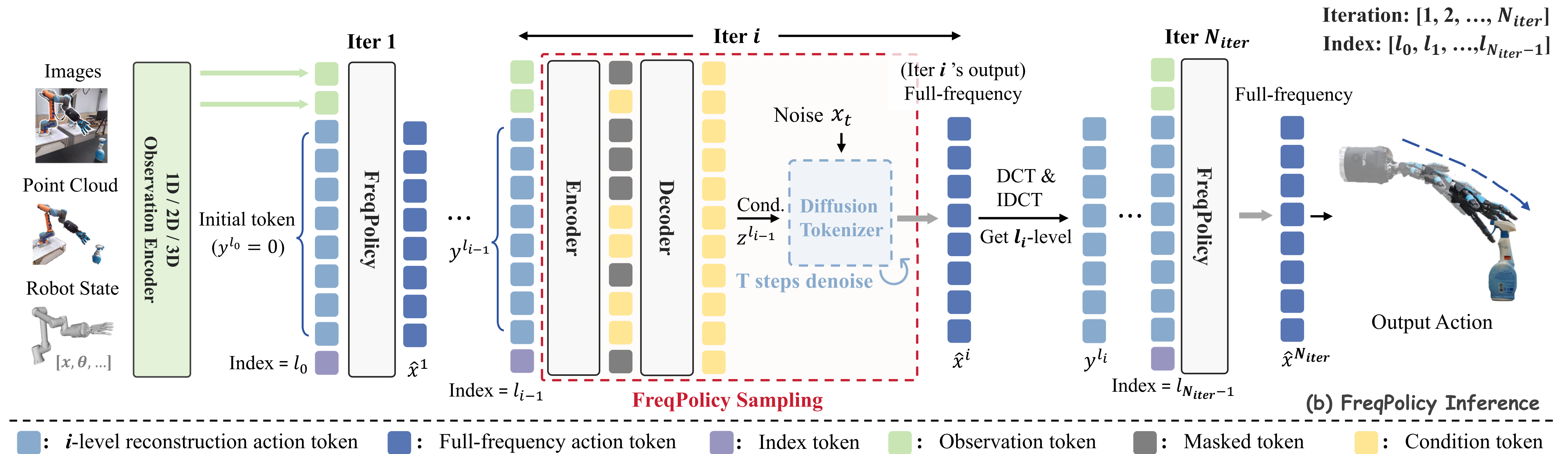
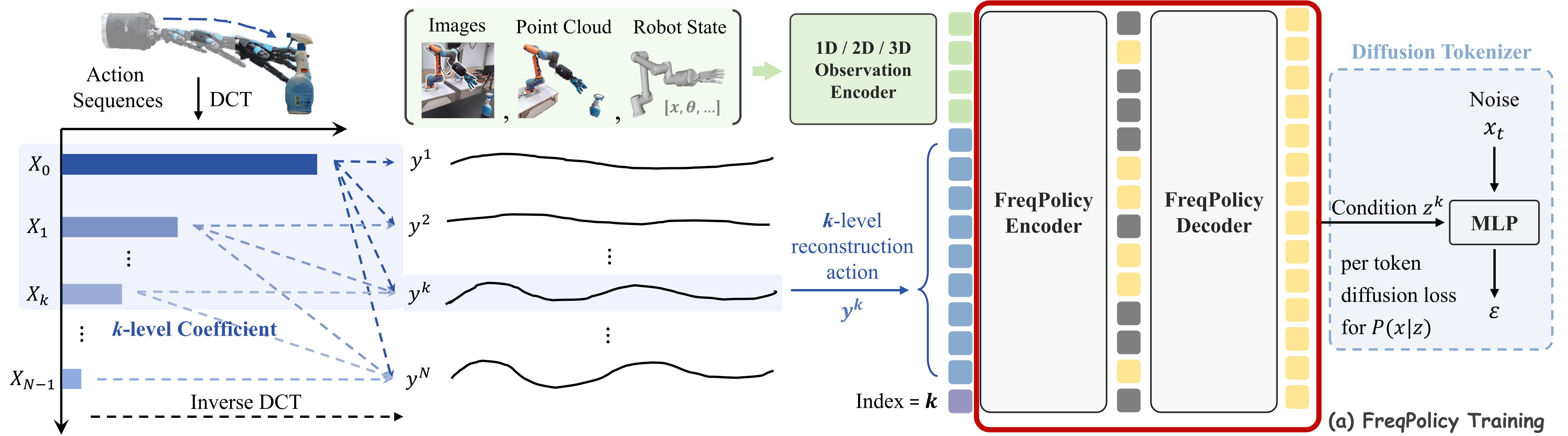


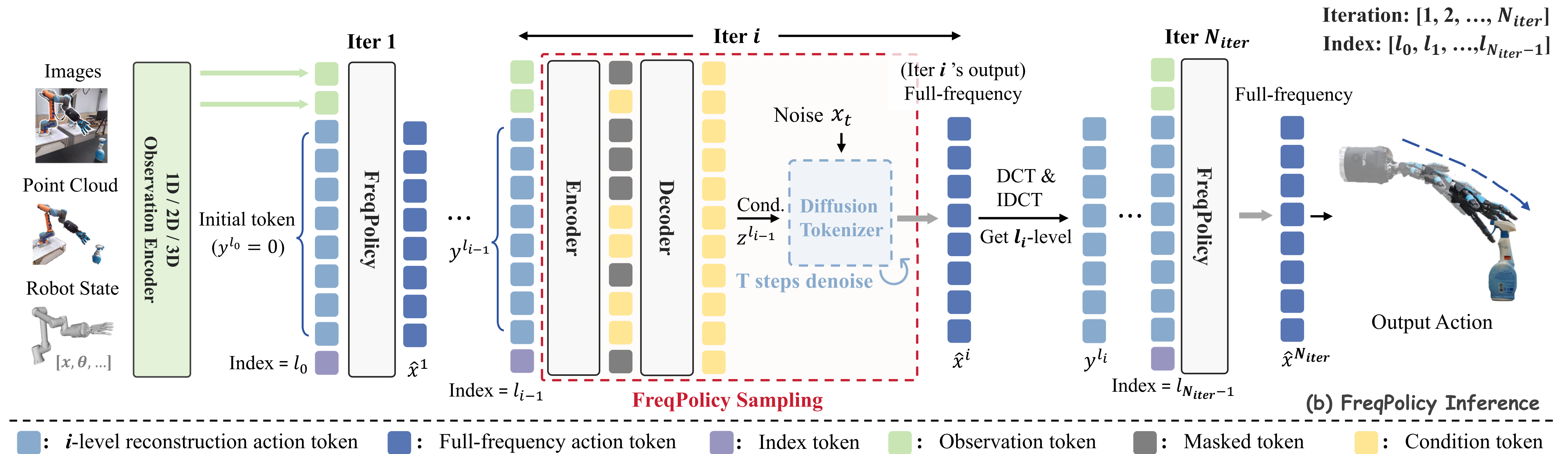
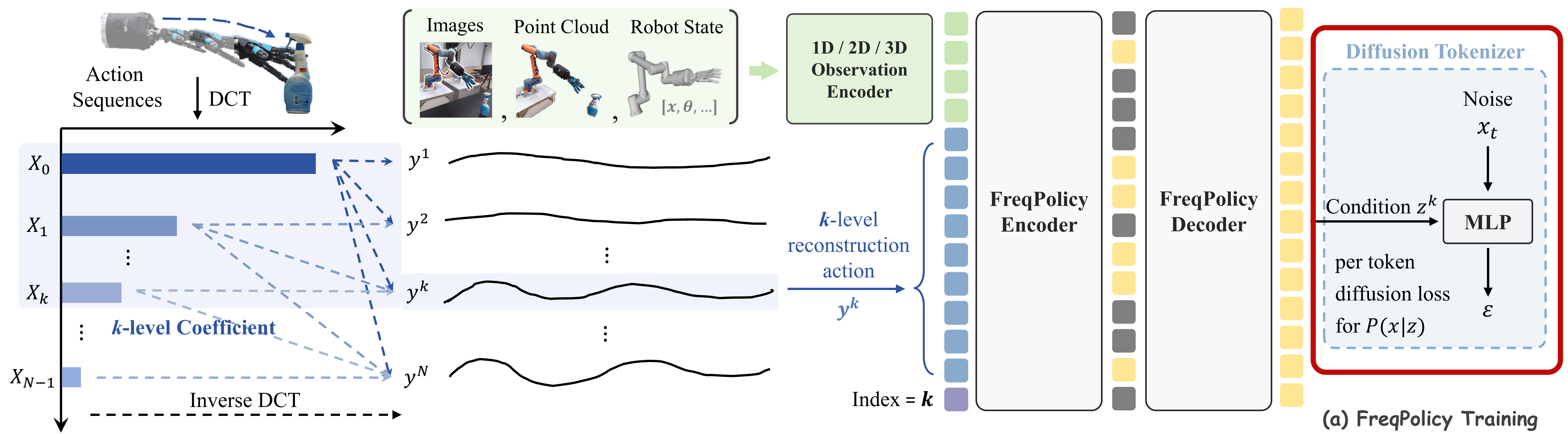
Tokenizer	Model	Lift(mh)		Can(mh)		Square(mh)		Transport(mh)		Push-T		Time
		Visual	State	Visual	State	Visual	State	Visual	State	Visual	State	
Diffusion Models												
Continuous	DP-C	1.00/1.00	1.00/0.97	1.00/0.96	1.00/0.96	0.98/0.84	0.97/0.82	0.89/0.69	0.68/0.46	0.91/0.84	0.95/0.91	2.11
	DP-T	1.00/0.99	1.00/1.00	1.00/0.98	1.00/0.94	0.94/0.80	0.95/0.81	0.73/0.50	0.62/0.35	0.78/0.66	0.95/0.79	1.35
Autoregressive Models												
Discrete	BET	–	1.00/0.99	–	1.00/0.90	–	0.68/0.43	–	0.21/0.06	–	0.79/0.70	0.007
	CARP	0.94/0.90	1.00/0.97	0.74/0.68	0.88/0.85	0.46/0.42	0.44/0.37	0.00/0.00	0.00/0.00	0.88/0.83	0.85/0.83	0.09
Continuous	Ours	1.00/1.00	1.00/0.98	0.98/0.94	1.00/0.90	0.84/0.78	0.88/0.74	0.58/0.50	0.50/0.38	0.82/0.76	0.92/0.85	0.21

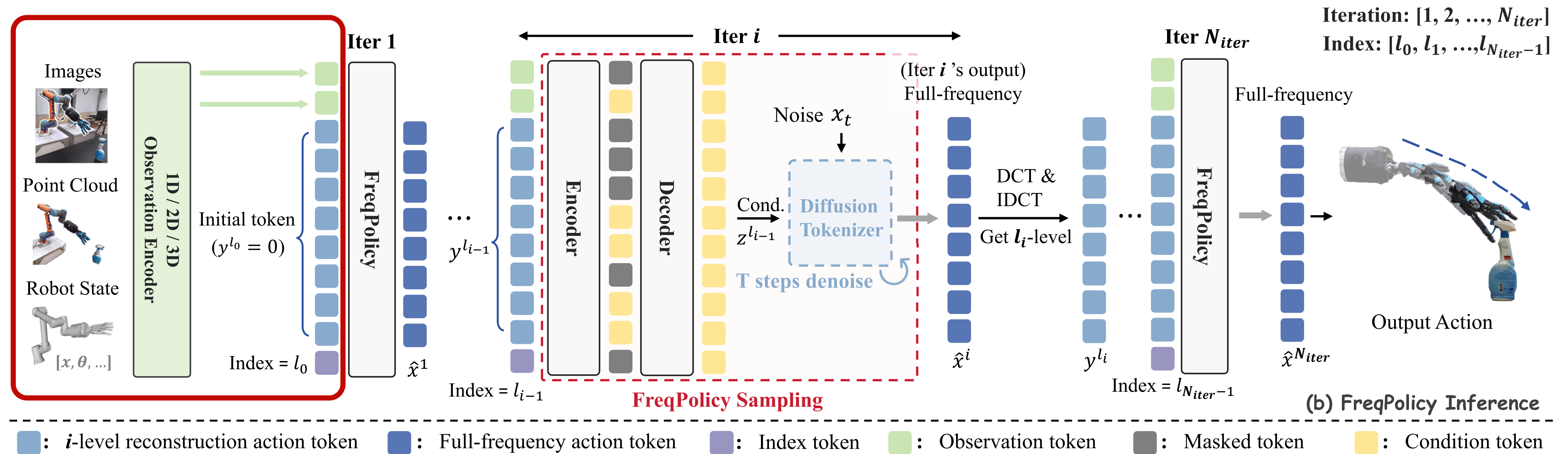
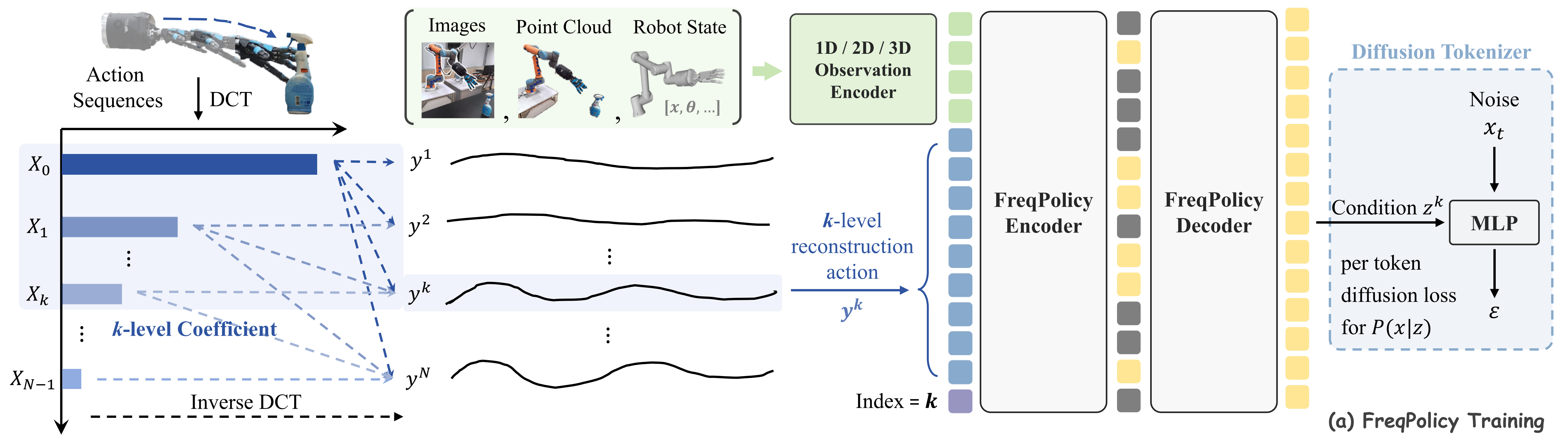
Exploring the Impact of Autoregressive Discrete vs. Continuous on Action Space

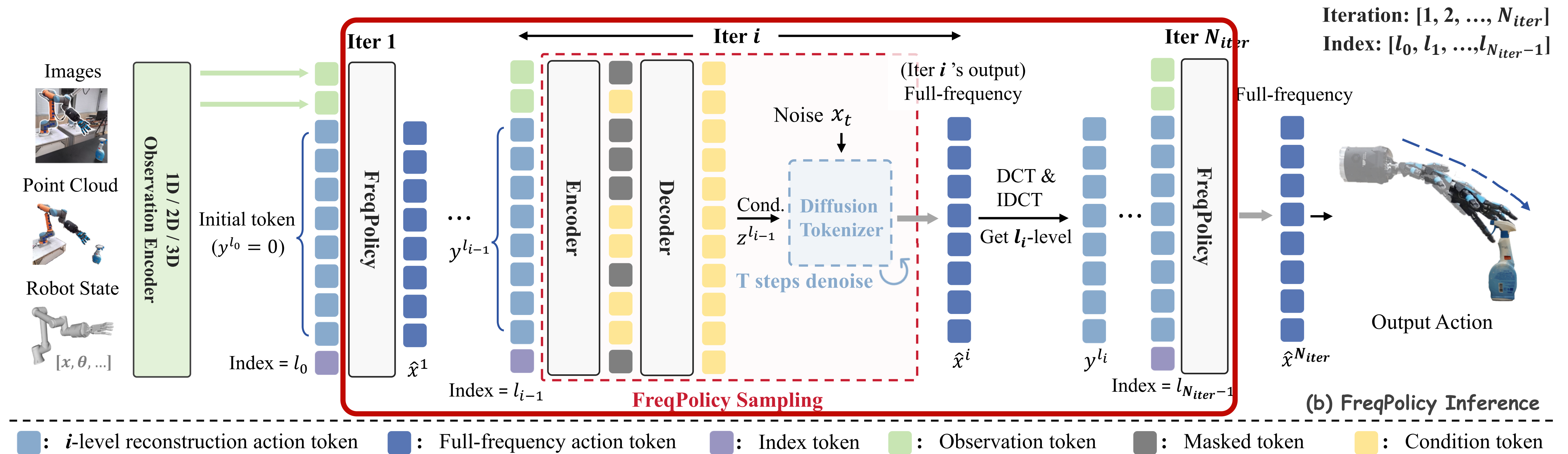
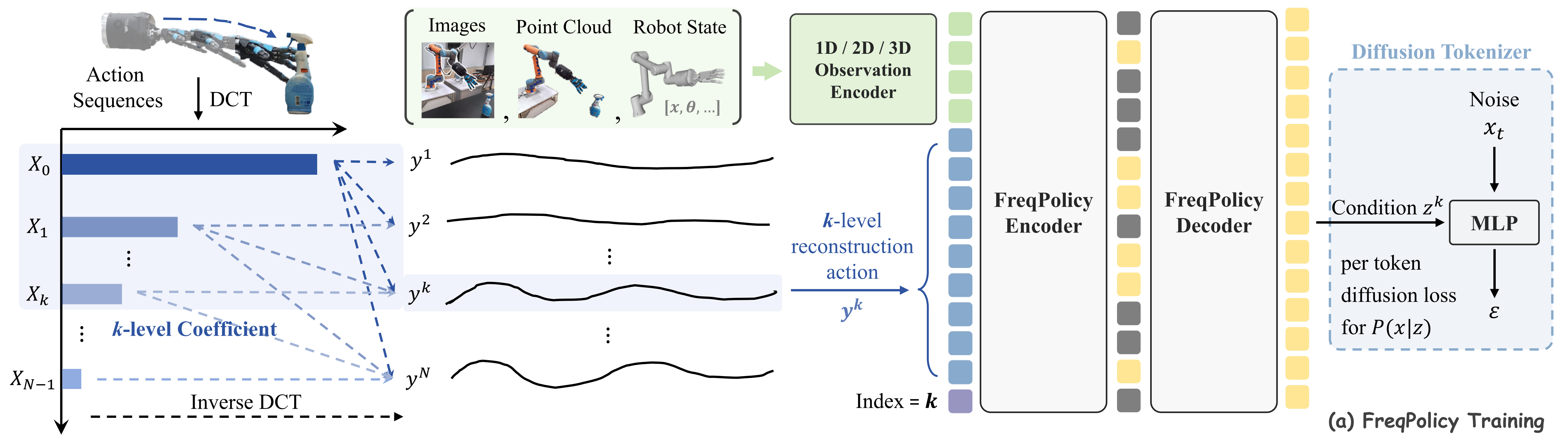
Method

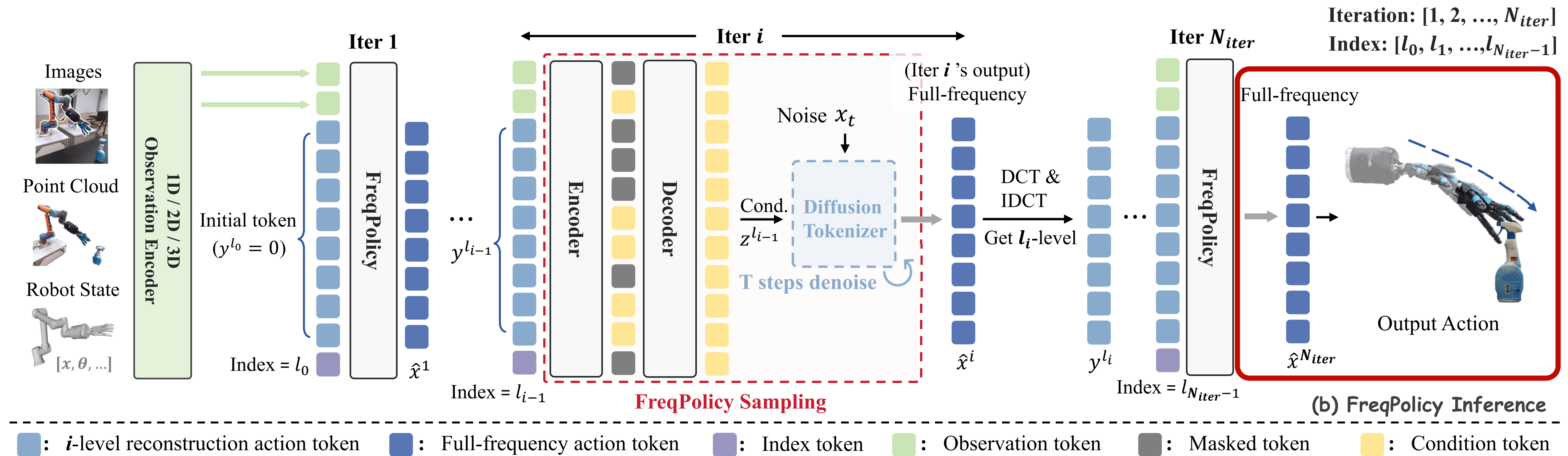
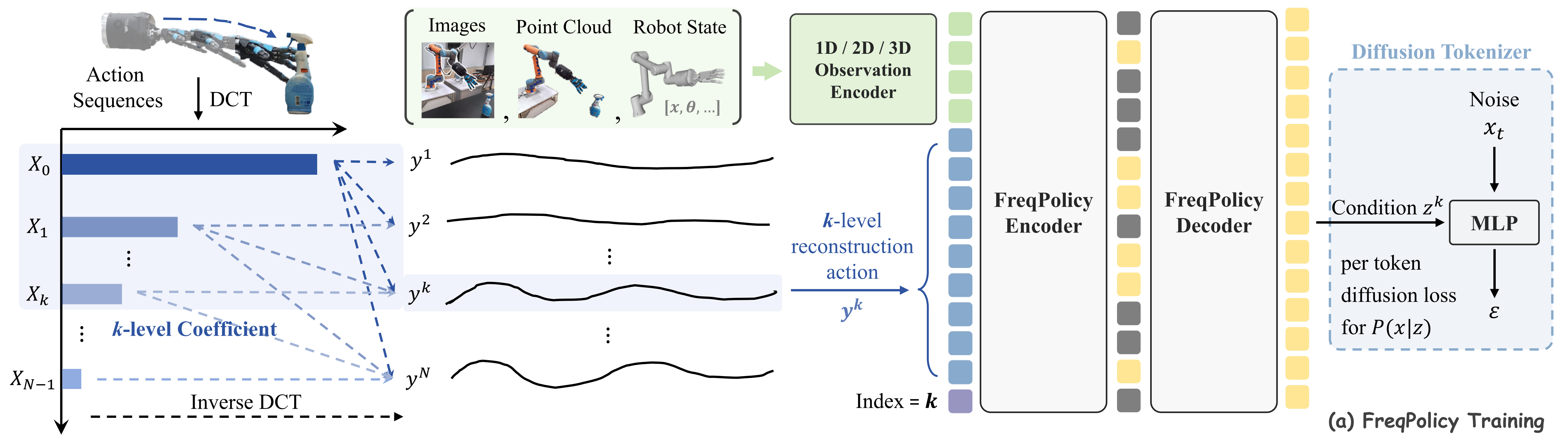












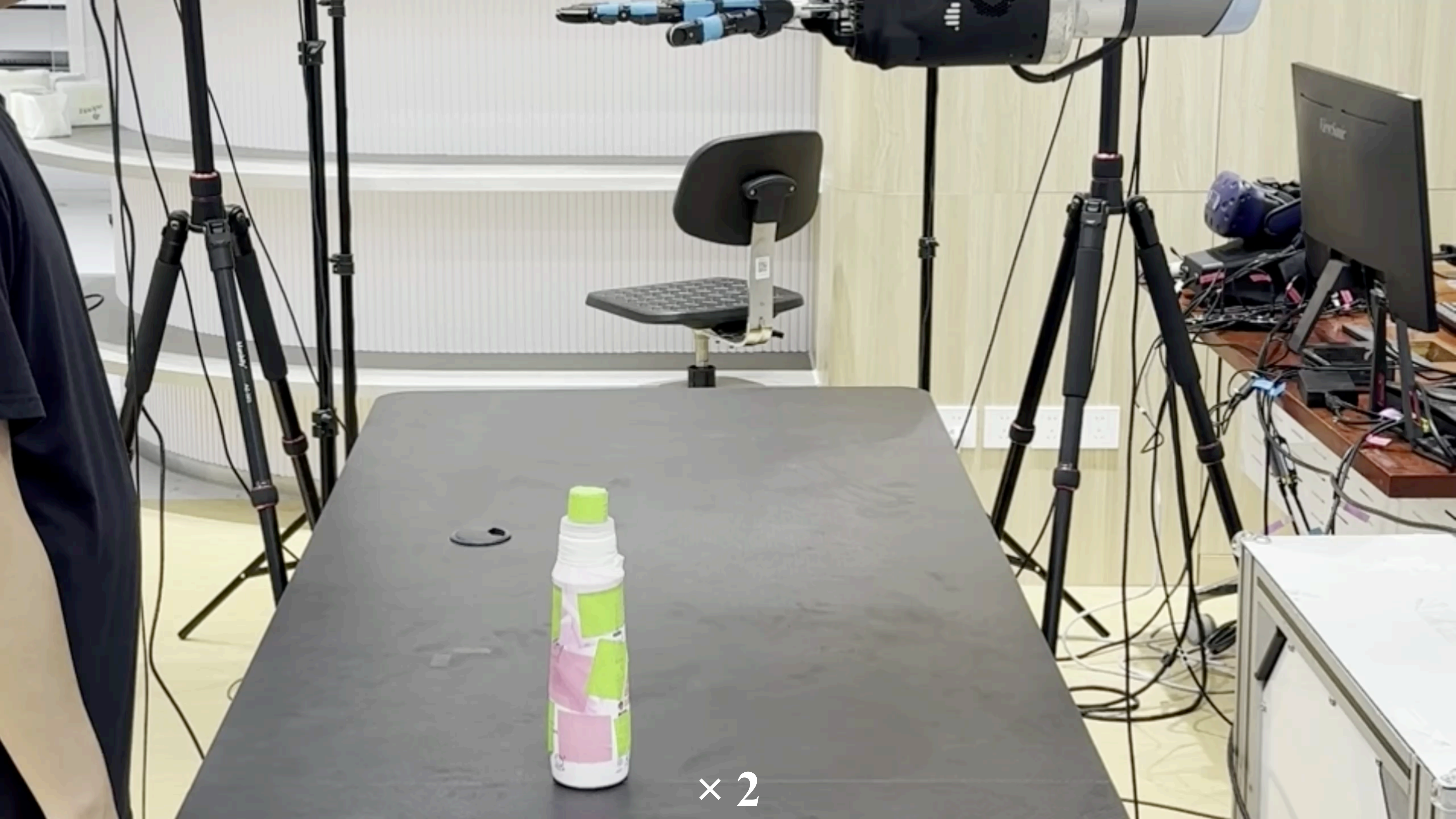
Real-world experiments



× 2



× 2



x 2

Thank you!