Teaching a household robot in VR

How we recorded corrections after a mistake HG-DAgger in the 2026 BEHAVIOR project

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Our robot learned from demonstrations

100 household tasks
20,000 expert demonstrations

A simulated home and a robot with two arms

A learned controller chooses movements from camera images

Robot tries a task

We save the failed moment

An expert shows a correction

The recording becomes an example

The person takes over with one button



The headset shows the simulated home.
Red border = person in control

[Play VR recovery (13 seconds)]

Watch the robot move

B: take full control

Correct with your hands

B: give control back

Headset and hand controllers

What the robot sees and what we teach

Camera image

Save images with the human’s movements.

Correct movement

Mark who controlled each moment.

Keep these together as a training example

Keep the human’s correction as an example.

The recording must connect a situation to a useful action.

The replay starting point changed the lesson

29 / 33

place recordings began with the can already held

Before the mistake:
people stopped it happening.

After the mistake:
our aim was to record recovery.

We moved the starting point from 5 seconds before the mark to 3 seconds after.

People could not record every correction

People in VR

78 recordings in four days on one task

Failures arrived faster than people could correct them.

Automatic help

Scripts and a stronger robot controller attempted saved failures.

They produced more correction examples.

Selected script recordings also received AI and human review.

A better grasp still left the full task unsolved

37.6% → 44.6%

Individual pick-up success
Stronger controller as teacher

383 pick-up tests

Human VR corrections:
not tested in movement training

New tasks in the submitted evaluation:
0 complete tasks in 490 runs

Compared with the same extra training using demonstrations alone

Grasping one object is one step in a much longer household task.

What VR design changes

Make it obvious who controls the robot.

Choose a useful moment to begin replay.

Check the video and the recorded movements.

Test whether people can teach good corrections.

Source: team report, 3 Nov 2026, §§4–7. AI use: drafting and slide construction.