

TECHNICAL OVERVIEW

Cobot Cognition: Technical Overview

How demonstration-based automation works under the hood.



Why conventional cobot programming breaks down.

Teach-pendant and motion-path programming works when the world holds still. Most real tasks don't. For variable, unstructured work, the conventional approach hits three hard limits.

01 Motion replay doesn't generalise.

A recorded path assumes the scene never changes. Shift the part a few millimetres, rotate it, or vary its shape, and the gripper closes on empty air. There is no notion of "the object" — only fixed waypoints in space. Every deviation is an unhandled case.

02 Programming time is measured in weeks, not hours.

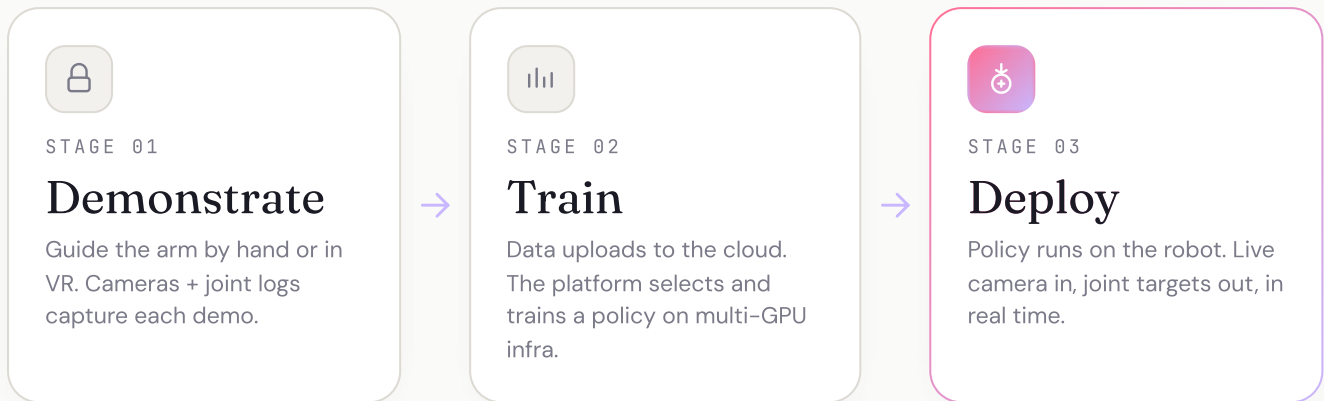
Each new application means teaching waypoints, tuning velocities and blends, scripting error handling, and testing edge cases by hand. Skilled engineers spend their time authoring motion instead of solving the customer's problem. The cost per deployment stays stubbornly high.

03 Whole task categories are effectively unprogrammable.

Deformable objects change shape unpredictably. Insertion within tight tolerances needs real-time response to contact, not a pre-scripted force profile. Bi-manual coordination explodes in complexity when written by hand. These tasks resist explicit programming no matter how much time you spend.



The pipeline: demonstrate, train, deploy.



A deployable AI policy – not a recorded motion path. It generalises from what it was shown; it does not replay it.

01

DEMONSTRATION CAPTURE

Show the robot the task.

- Physically guide the robot through the task (kinesthetic teaching) or operate it via VR teleoperation.
- The system logs joint positions, joint velocities, joint target positions and RGB – all timestamped and synchronised.
- Multiple cameras capture RGB streams throughout every demonstration.
- A handful of demonstrations – not hundreds – collected across the expected range of variation.

02

AI MODEL TRAINING · CLOUD

Train a policy from the demonstrations.

- Data uploads and a model trains in the cloud. The platform auto-selects the appropriate model for the task – no algorithm choice required.
- Training runs on multi-GPU cloud infrastructure; monitor progress from a dashboard.
- Under the hood it draws on a suite of modern imitation learning algorithms; selection is transparent, with zero configuration.
- The output is a deployable policy that generalises from examples – not a fixed sequence.

03

DEPLOYMENT & INFERENCE

Run it on the robot.

- The trained policy deploys back to the robot.
- It handles variation – objects in new positions, states never seen exactly during demos – because it learned to generalise.
- At inference, the robot reads live camera input to understand the current scene and outputs joint target positions in real time.
- Inference runs locally or via a cloud endpoint.

Robot support & integration.

Out-of-the-box support, with pre-built integration code per platform. You connect via a URDF robot description — the platform handles the rest. No custom ROS drivers, no proprietary interfaces.

Universal Robots

OUT OF THE BOX

Fanuc

OUT OF THE BOX

ABB incl. dual-arm YuMi

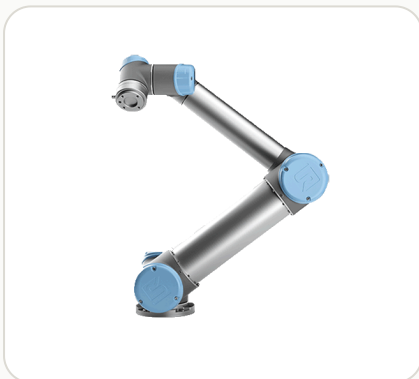
OUT OF THE BOX

More platforms

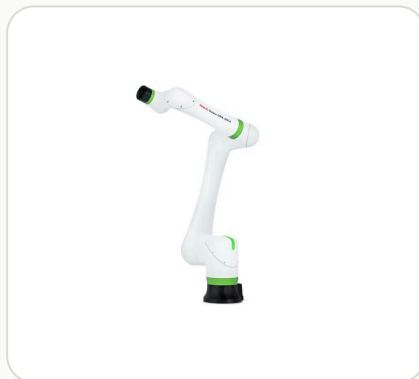
IN DEVELOPMENT

WHAT THE INTEGRATION LOOKS LIKE

- 01 Robot described via URDF.
- 02 Platform streams joint states and camera feeds.
- 03 Trained policy outputs joint target positions back to the robot.
- 04 Works alongside existing setups — no ripping and replacing.



UNIVERSAL ROBOTS — UR SERIES



FANUC — CRX SERIES



ABB — INCL. DUAL-ARM YUMI

• Manufacturer product imagery — confirm licensing before publication.

What this unlocks.

Five task categories that conventional programming can't reach — and why they become tractable when the robot is taught by demonstration.

01 Deformable object handling

Fabrics, foam, food items. Impossible to program conventionally because the object's shape changes unpredictably from cycle to cycle — there's no stable geometry to script against.

02 High-tolerance insertion & assembly

Peg-in-hole, connector mating, press-fits. Needs real-time adaptation to contact as it happens, not a pre-specified force profile that assumes perfect alignment.

03 Bi-manual coordination

Two cobots working on a single task. The AI learns coordinated behaviour directly from demonstrations — the cross-arm timing that is impractical to author by hand.

04 High-variation pick & place

Objects presented in different positions, orientations, and states each cycle. The policy reads the scene and adapts, rather than expecting parts in a fixed pose.

05 Tasks requiring scene understanding

Where the robot must interpret visual context to decide what to do. It acts on what it sees, instead of executing one fixed motion regardless of the scene.



Evaluating whether this fits your application?

The best next step is a 30-minute technical call with our team. We'll walk through your specific task, the robot you're using, and what a proof of concept would look like. No deck — just engineers talking through the problem.

[Book a technical call →](#)

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Cobot Cognition

The brain your cobot was missing.