APERA

2025

Introduction to Apera Forge

Simulation and Training for Bin Picking and De-Racking

APERA AI COPYRIGHT © 2025

Derek Burrows

Sr. Product Manager

Neil Goossen

Engineering Manager

Technical Lead for Forge

APERA AI COPYRIGHT © 2025

Agenda

1. Apera Forge Overview
2. Creating a simple cell in Forge
3. Diagnosing and solving problems with Forge
4. Sending a Forge cell for training
5. What’s New in Forge?
6. Live Q&A

APERA

APERA AI COPYRIGHT © 2025

POLL #1
Journey

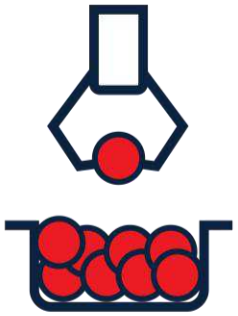
APERA AI COPYRIGHT © 2025

About Apera AI

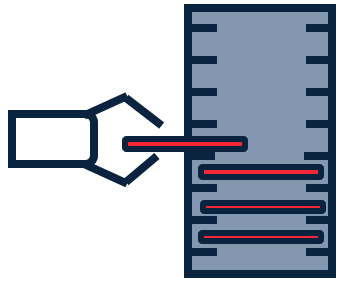
- Founded in 2016 by vision industry veterans
- Based in Vancouver, Canada, with sales and support teams across N.A. and Europe
- Hundreds of cameras deployed, including at all top 6 automotive OEMs
- Compatible with all major robotics brands:

FANUC · ABB · Kawasaki Robotics · DENSO · YASKAWA · STÄUBLI · UR · EPSON · OMRON · JAKA · KUKA · MITSUBISHI ELECTRIC AUTOMATION, INC. · DOOSAN

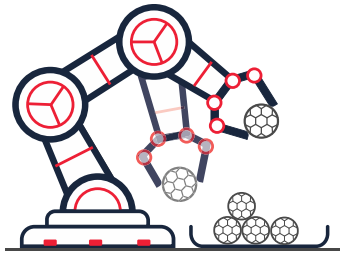
Application expertise



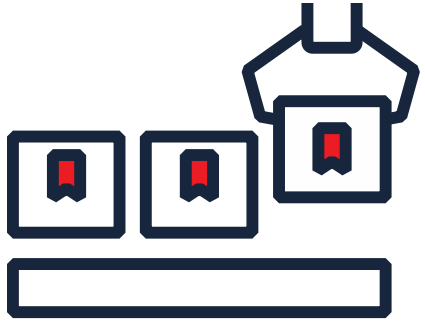
Bin Picking



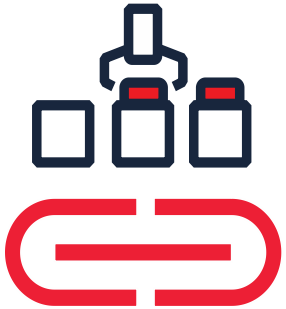
Racking & Deracking



Robotic Guidance



De-palletizing



Assembly

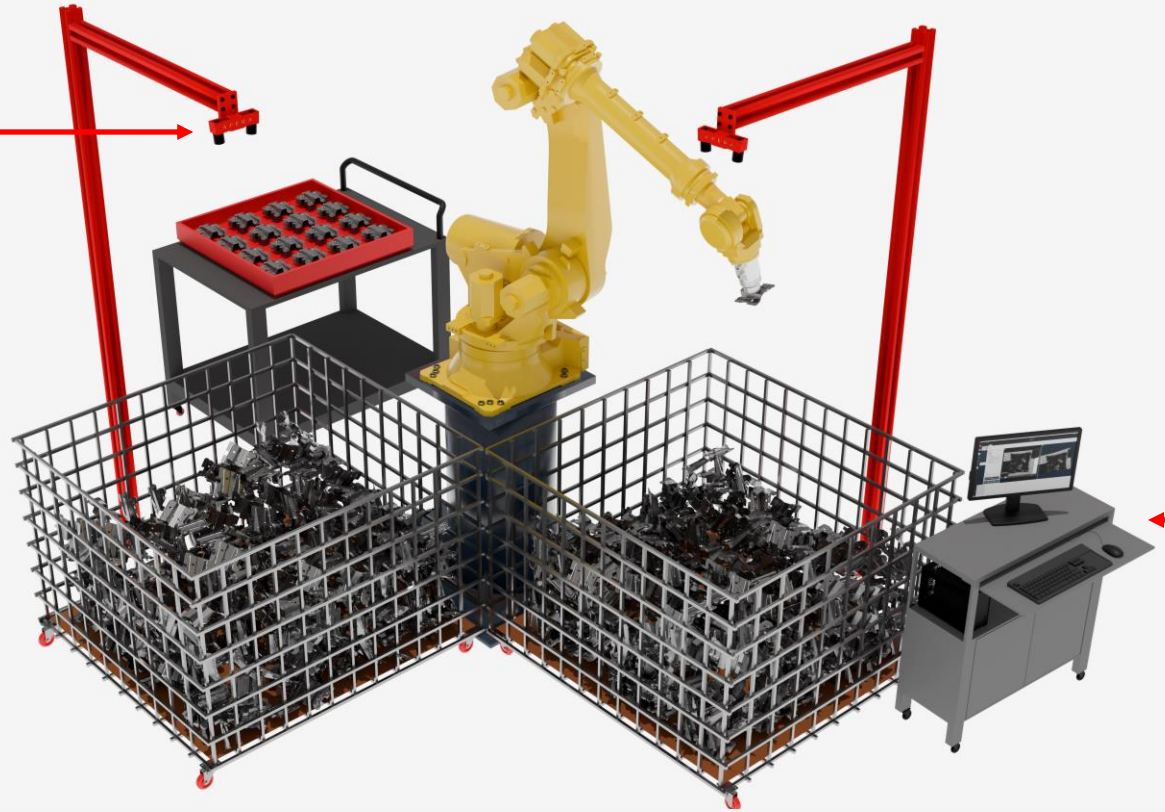
APERA AI COPYRIGHT © 2025

Apera 4D Vision system hardware

- Use any off-the-shelf or custom EOAT (end-of-arm tool
- Universal robot compatibility

VuePorts

Off-the-shelf 12MP+ stereo cameras capture detailed imagery



Apera Vue PC

Vision controller captures and processes images, and sends poses & pathing to robot

APERA

APERA AI COPYRIGHT © 2025

Apera's approach to VGR: simulate, train, operate

Apera Forge

Simulate

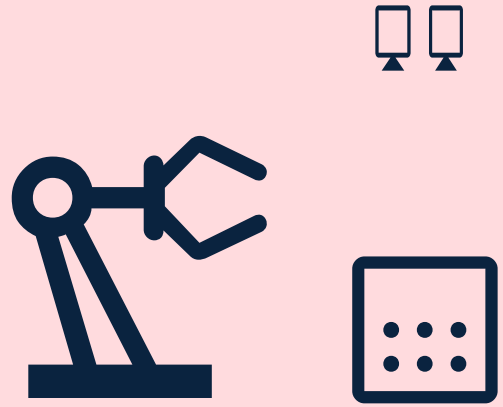
Simulate your cell, testing pickability. Then, send your cell for training.

Train

Neural networks are trained on your cell, generating ready-to-use vision code for your parts

Apera Vue

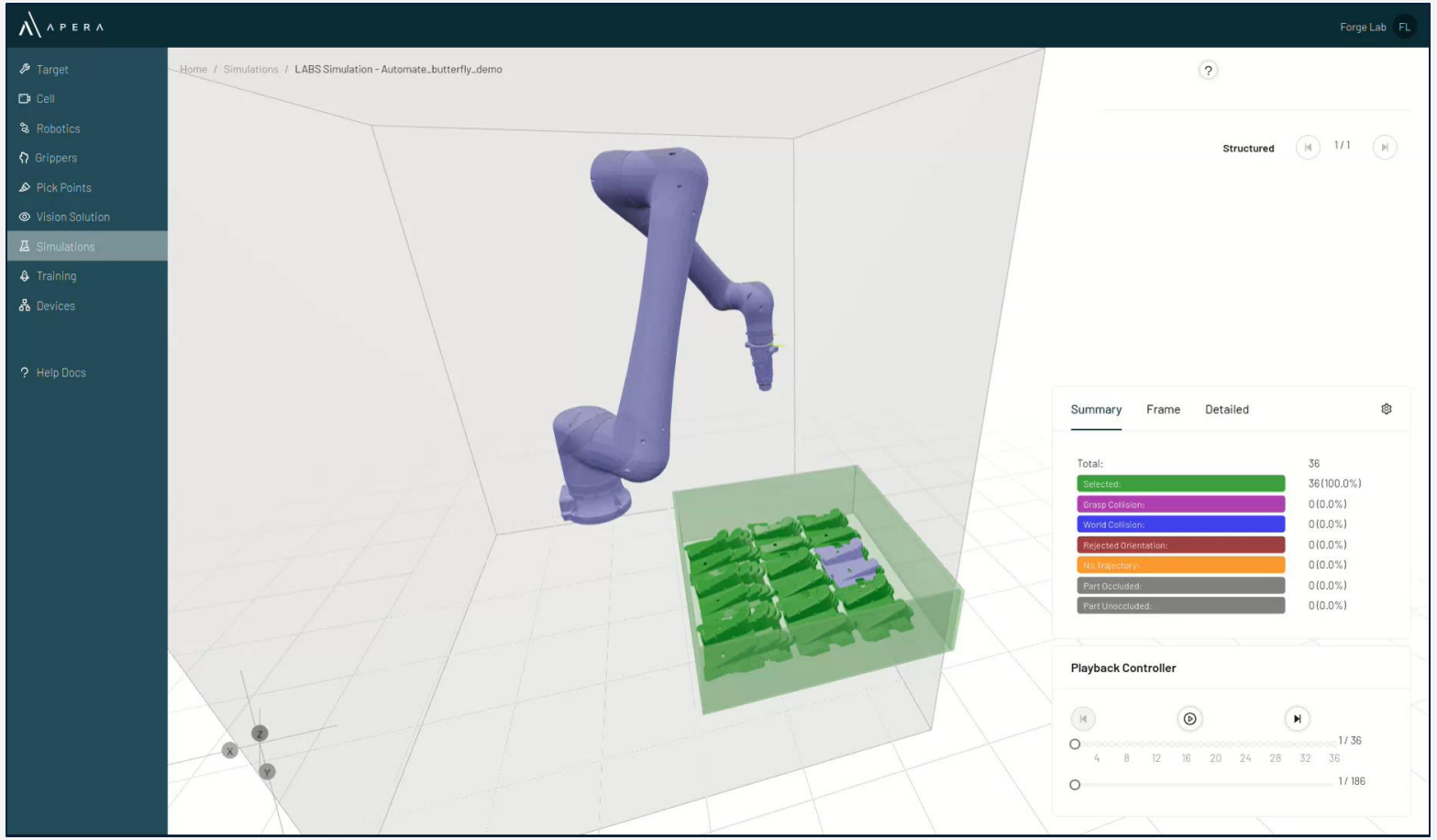
Operate



Deploy your trained neural network in the field, for industry-leading performance

APERA AI COPYRIGHT © 2025

Apera Forge: VGR simulation and training



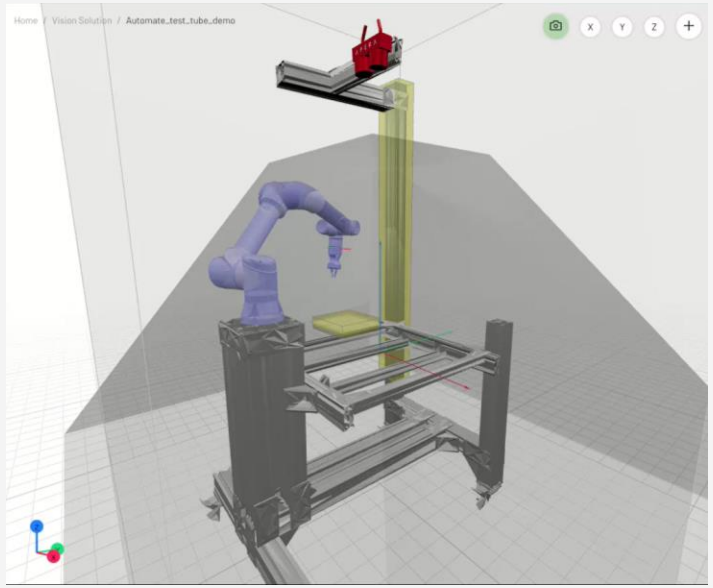
Product highlights:

- **Browser-based app** – no need for hardware or site access.
- Wide **library of robots** to choose from
- **Simulate a cell** in minutes, and watch each pick
- **Diagnose issues** with part-by-part pickability scoring

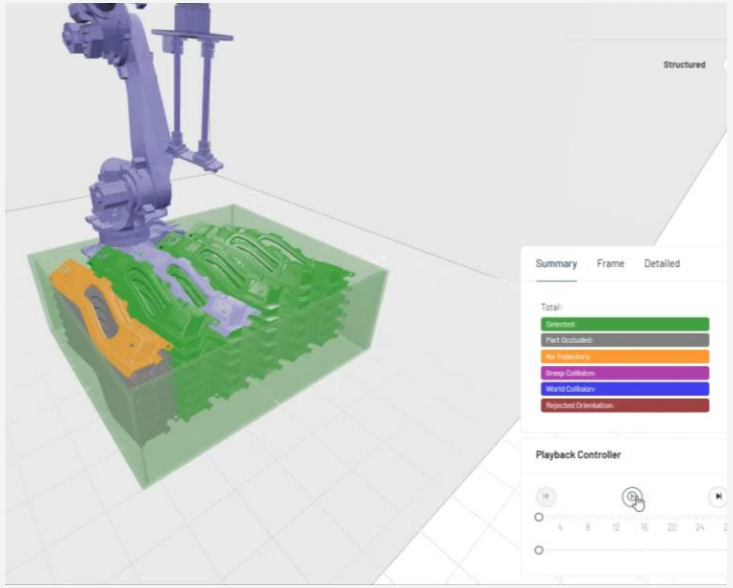
APERA AI COPYRIGHT © 2025

How Forge works

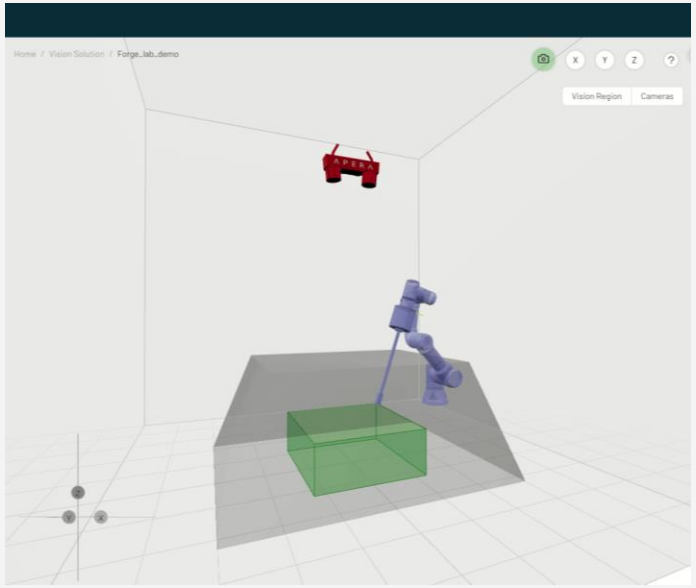
① **Set-up** your cell: select a robot, upload your parts and EOATs, and place cameras and obstacles.



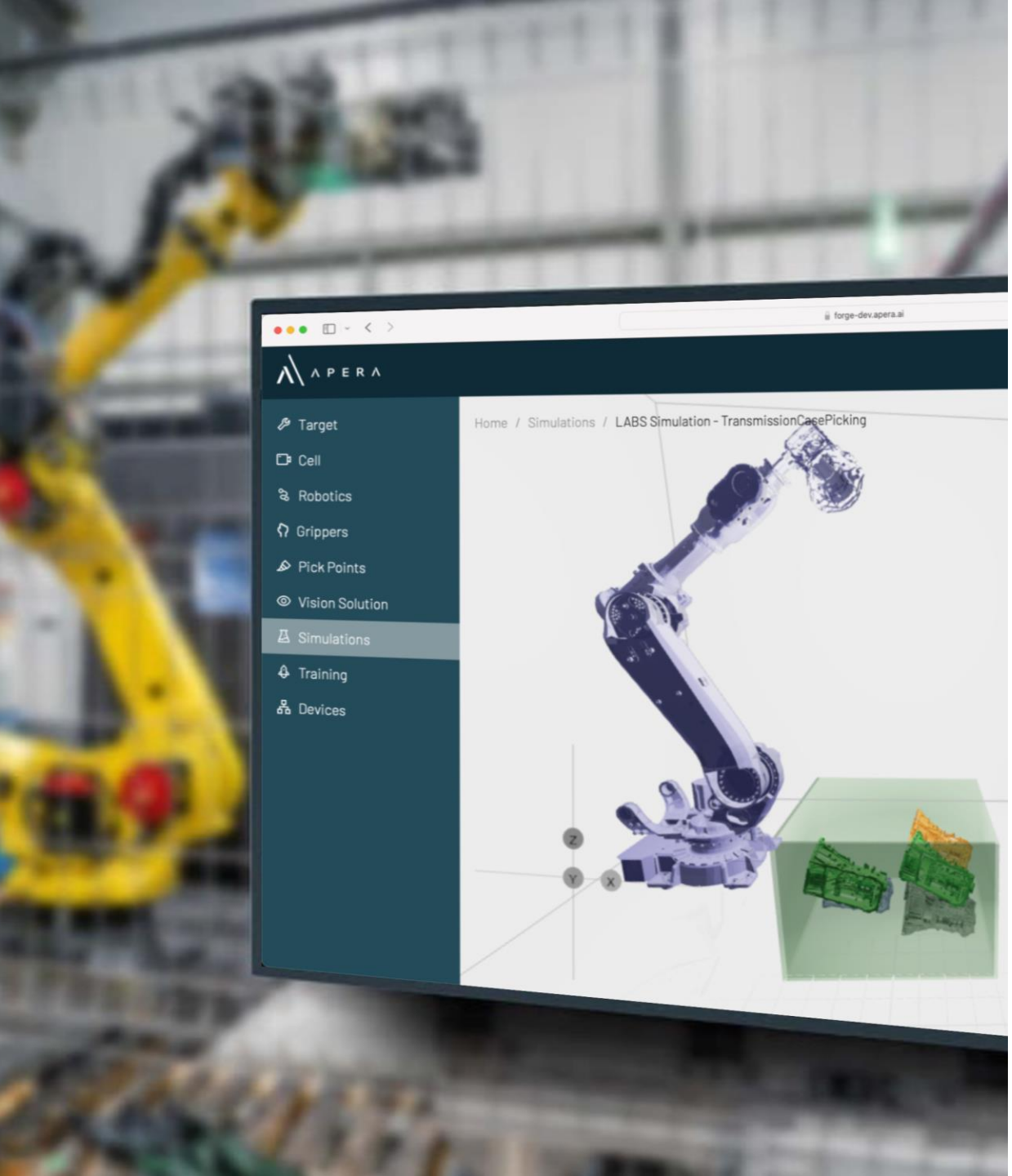
② **Simulate**, **evaluate** pickability, and **modify** your design to improve performance.



③ Send data for **training** with one click – and 24-48h later, deploy to your Vue PC.



APERA AI COPYRIGHT © 2025



Why simulate your cell?

When it comes to emptying your bin, geometry matters.

Cell layout

Reaching every corner and edge of your bin requires careful layout of robot, bin, fences, and obstacles.

Gripper design

End-of-arm-tool (EOAT) design must allow you to pick parts, even deep in the bin, without collisions

Pick point selection

Parts need to be pickable from every angle, at multiple rotations, to effectively empty bins

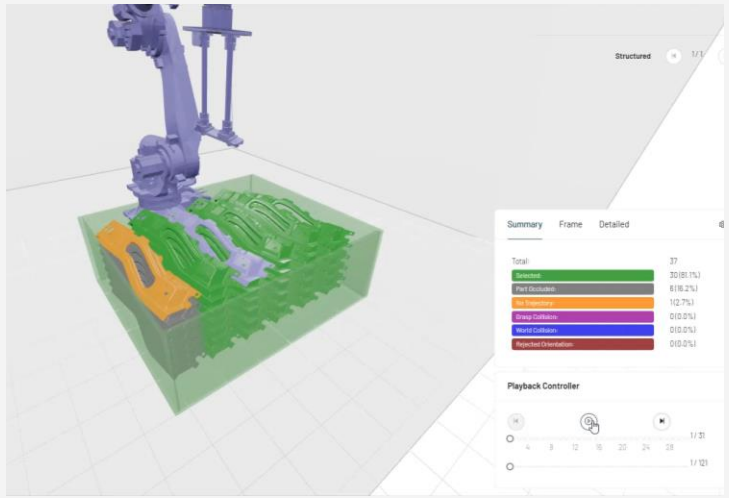
A lack of cell simulation leads to costly re-work and delays

APERA AI COPYRIGHT © 2025

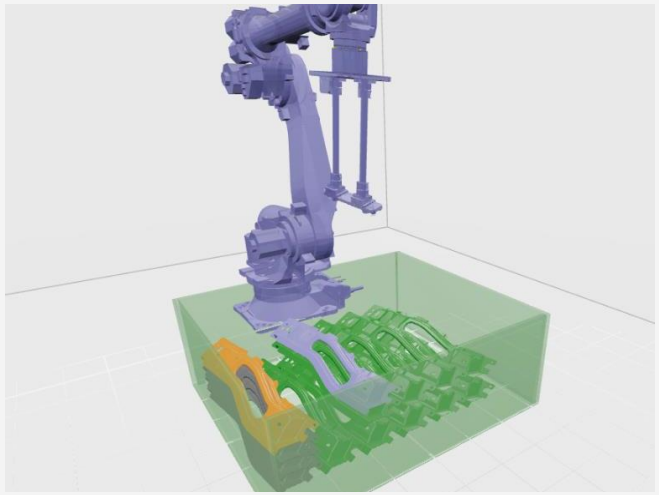
Case study

Example: catching a design issue

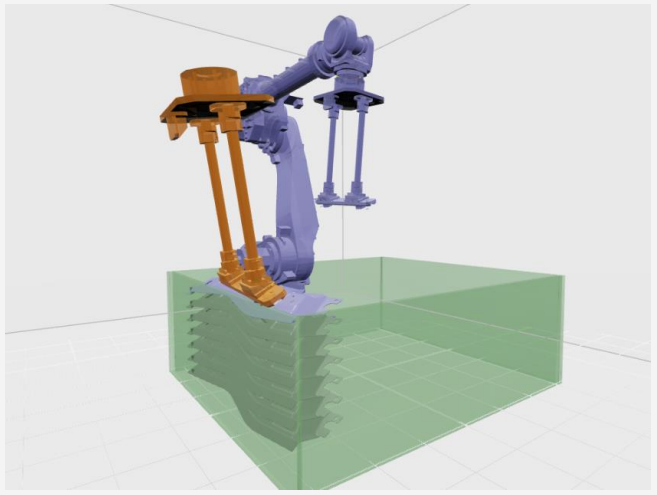
Forge simulates cell, robot, custom gripper, bin and structured parts



During simulation, parts in left-most column are found to be unpickable



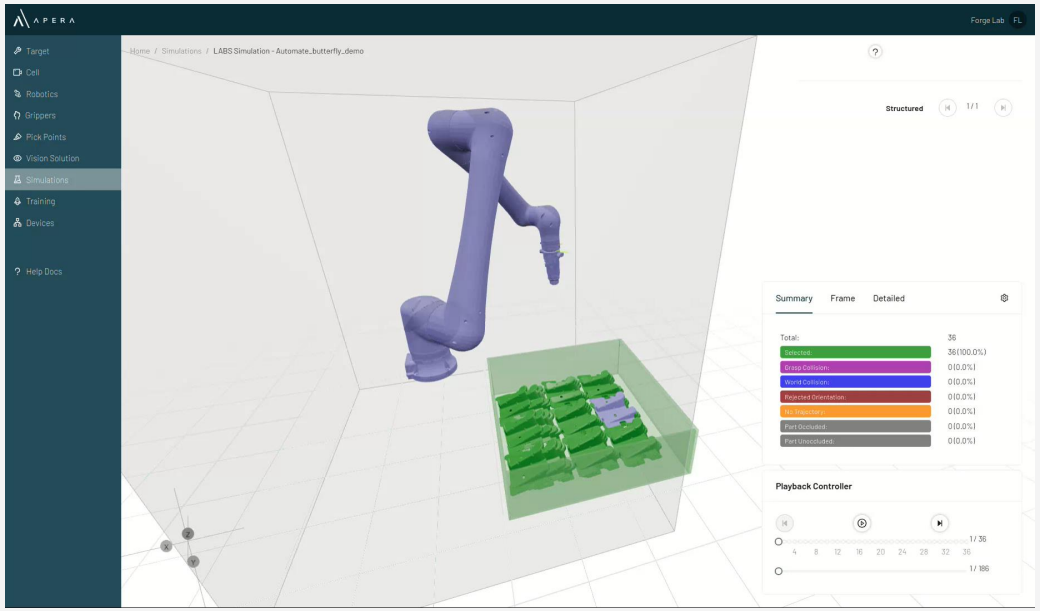
Investigation reveals the robot geometry incompatible with the desired gripper angle.



Time to redesign the gripper or reposition the bin!

APERA AI COPYRIGHT © 2025

From sim-to-real: training AI assets with Forge



Train an asset in Forge...

And run that trained model on-site.

APERA AI COPYRIGHT © 2025

Forge-trained asset advantages

Accurate

Apera vision systems reach 99.9% reliability in recognizing objects and performing tasks.

Fast

Total vision cycle time as low as 0.3 seconds—delivers up to 10X the speed for up to 2,000 picks /hour.

Light resilient

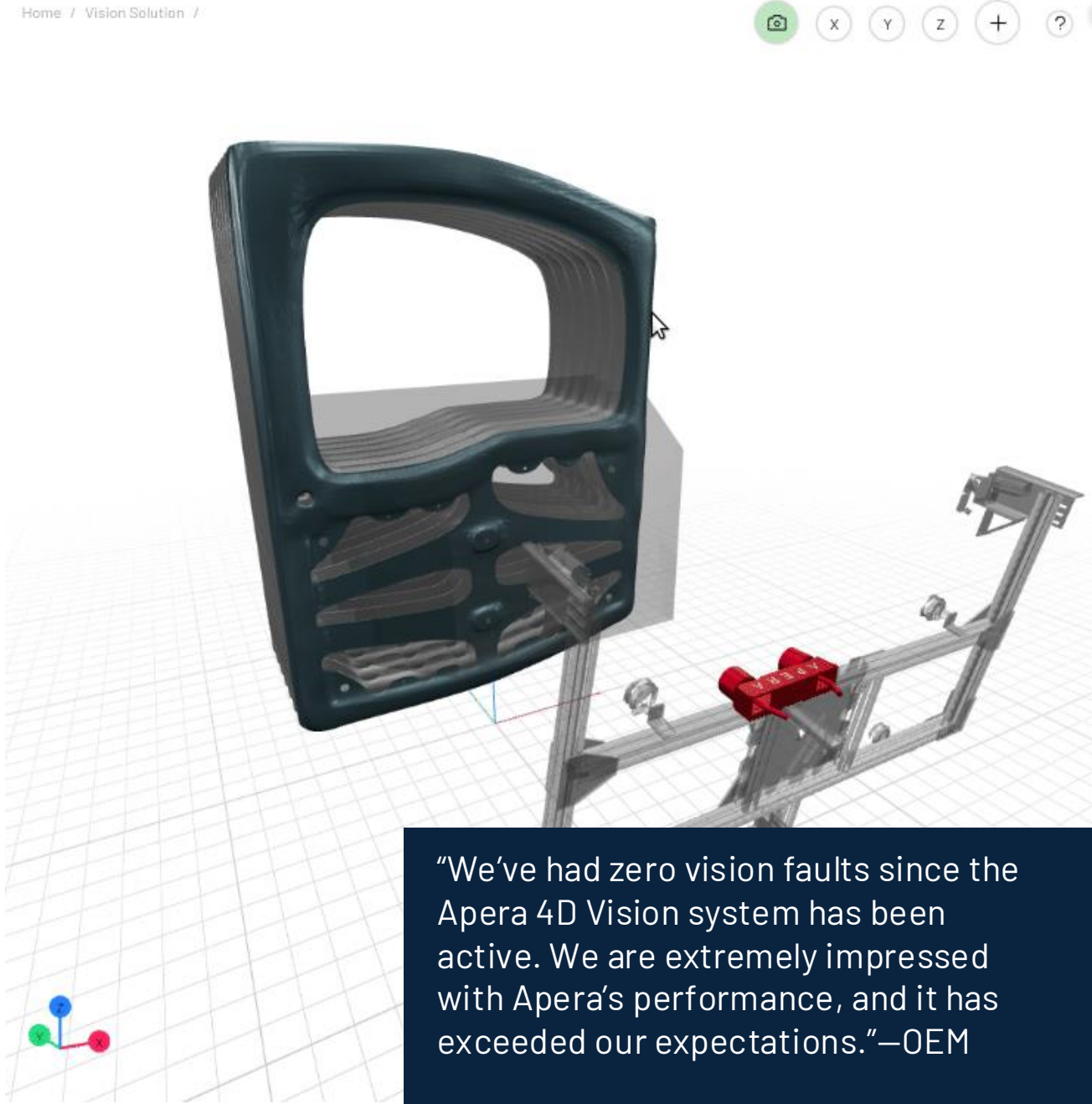
Works in all lighting conditions—bright, dark, outside, variable—without special equipment.

Difficult materials

Works with all finishes—shiny, clear, translucent— and even difficult bin materials.

No vision expertise

Forge trains an AI neural network through a million cycles, delivering a plant-ready vision program.



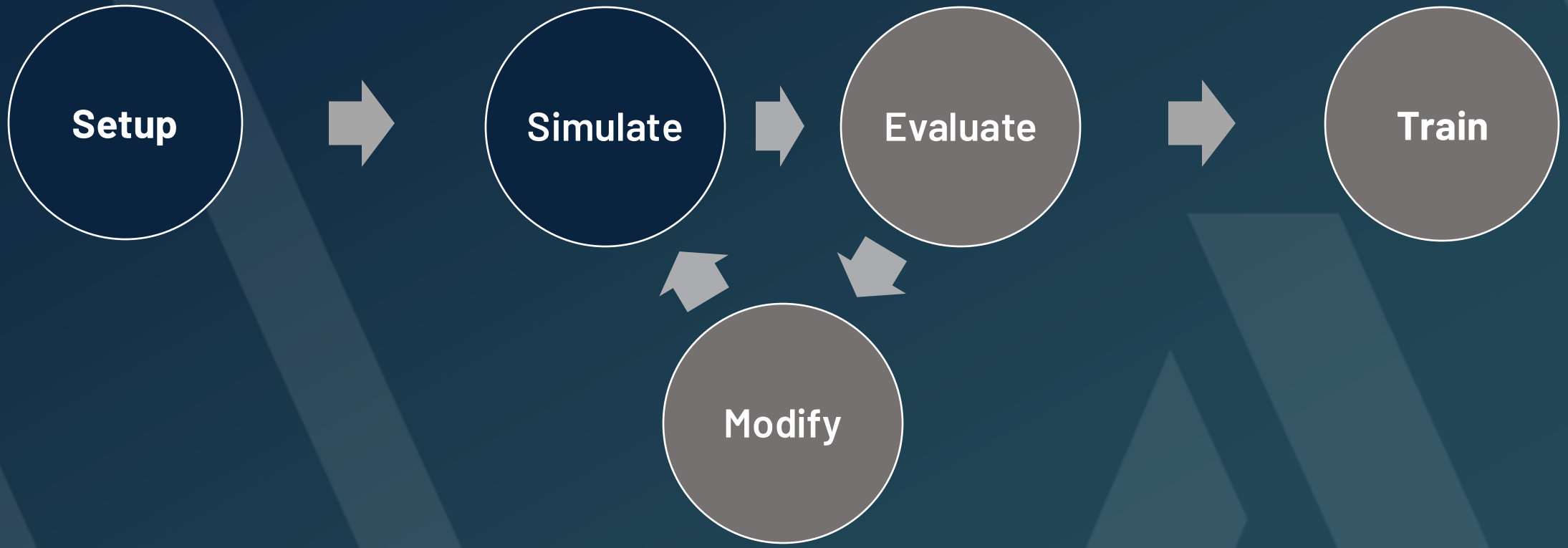
"We've had zero vision faults since the Apera 4D Vision system has been active. We are extremely impressed with Apera's performance, and it has exceeded our expectations."—OEM

APERA AI COPYRIGHT © 2025 – STRICTLY CONFIDENTIAL

Creating a simple cell demo

APERA

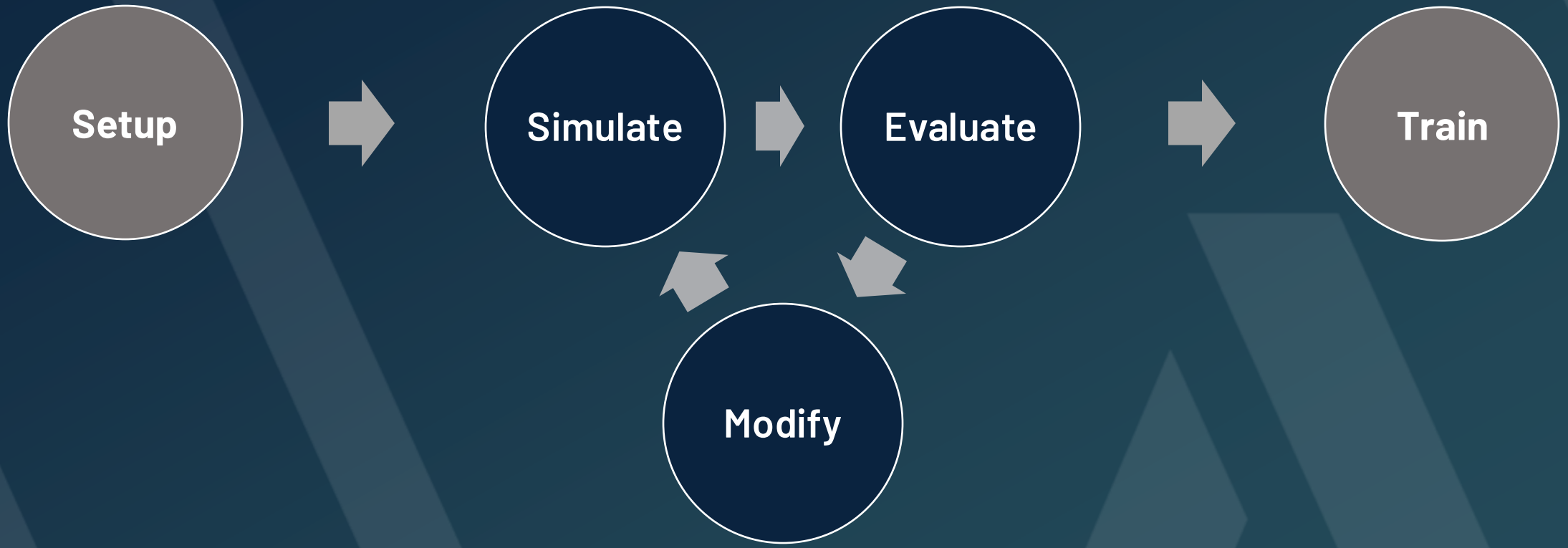
APERA AI COPYRIGHT © 2025



APERA AI COPYRIGHT © 2025

Troubleshooting design demo

APERA AI COPYRIGHT © 2025



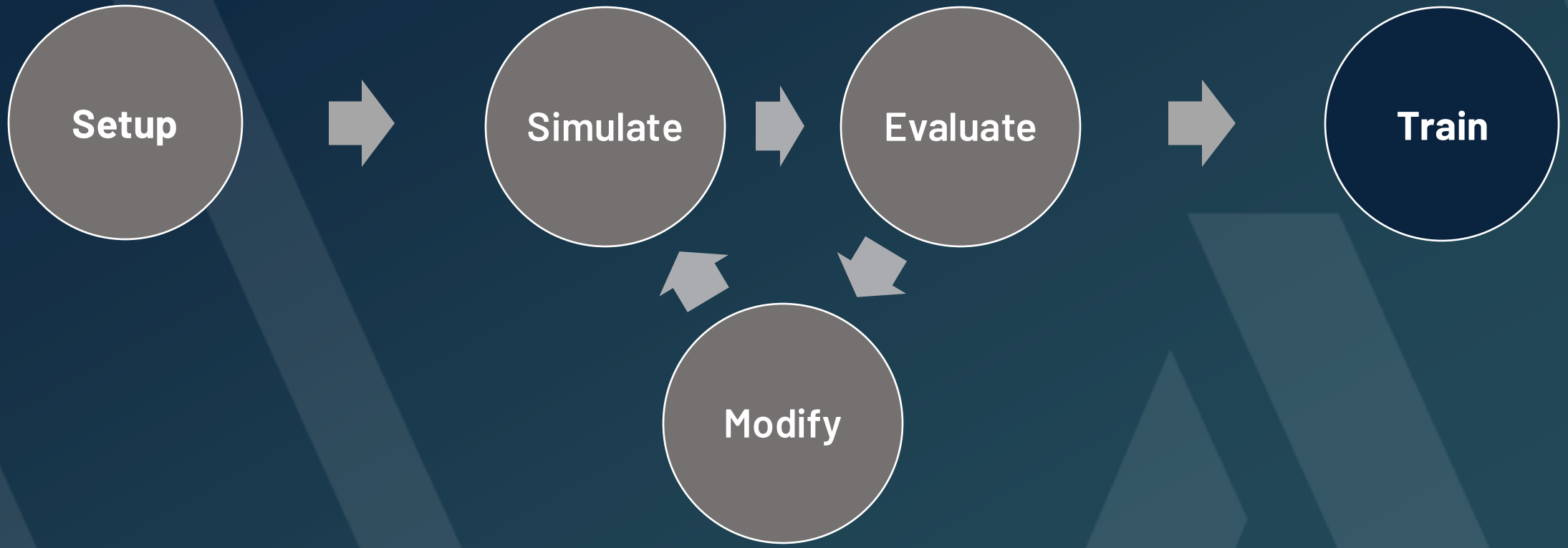
APERA

APERA AI COPYRIGHT © 2025

Training assets demo (bin picking and de-racking)

APERA

APERA AI COPYRIGHT © 2025

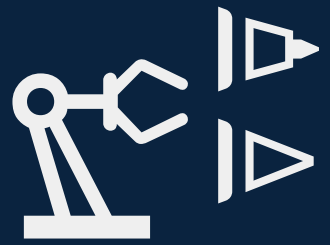


APERA AI COPYRIGHT © 2025

Recap: why use Forge?

Validate your cell layout

Test multiple EOAT designs



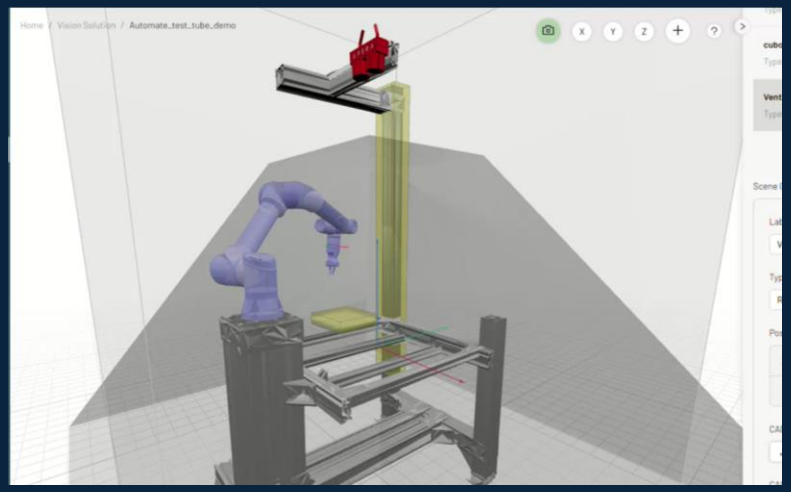
Understand pickability

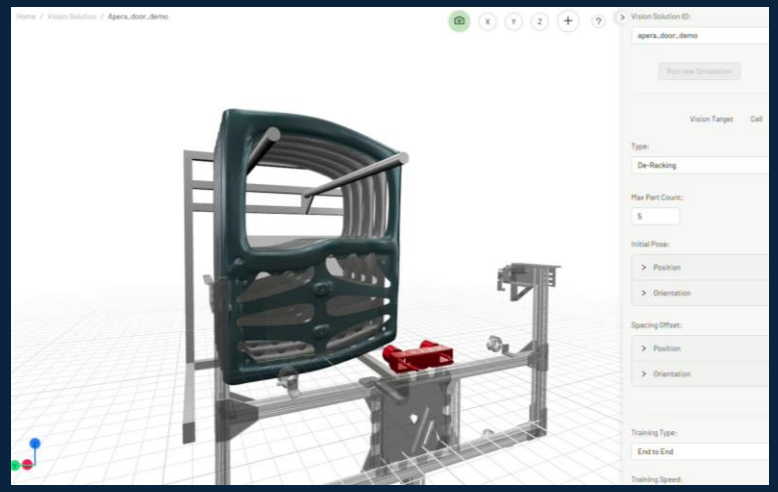
Start training on your schedule

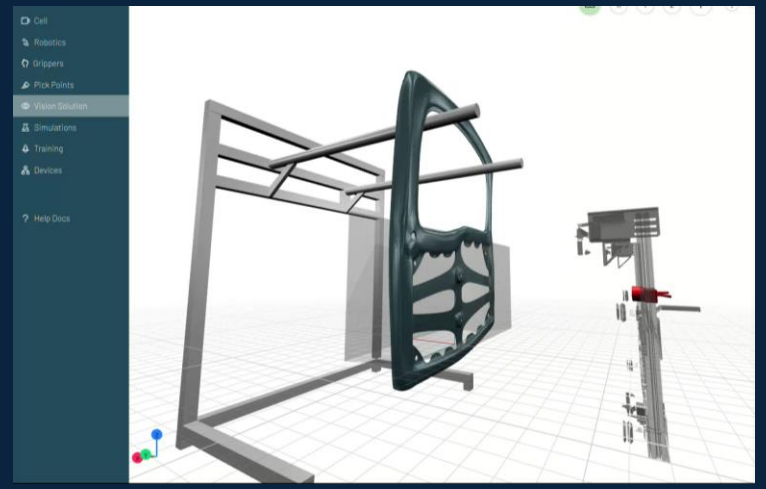
APERA AI COPYRIGHT © 2025

JULY 2025 – THE DE-RACKING RELEASE

What's new in Forge?







Advanced robotic cell design

New tools for tuning camera placement, bin & rack position, and multi-obstacle placement

EOAT camera mounting

Design and validate eye-in-hand setups, and test L and R cameras, for de-racking applications.

Train de-racking cells

You can now define structured de-racking cells and send them for training on your schedule.

APERA AI COPYRIGHT © 2025

POLL #2
Additional information

APERA AI COPYRIGHT © 2025

LIVE Q&A

Try Forge today!

link.apera.ai/signup

forge@apera.ai

APERA AI COPYRIGHT © 2025