

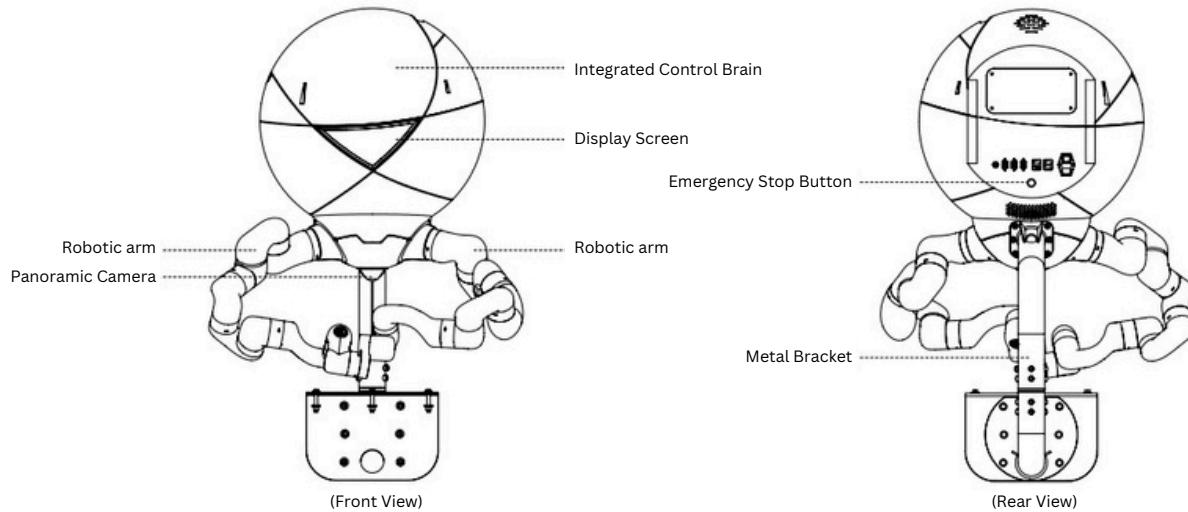


Artificial Intelligence Robotic Barista System

LUOBOT Dual-Arm A.I. Robot

- The LUOBOT dual-arm A.I. robot is a general-purpose service robot.
- Specifically designed for fixed workstation scenarios in the service industry, such as the food and beverage sector.
- The bionic dual arms possess the fundamental capabilities of human upper limbs.
- After training, it can perform the majority of human operations and skills.

The LUOBOT dual-arm robot consists of an integrated control brain and two six-axis robotic arms. These arms, combined with various robotic grippers, can mimic human upper limb movements such as grasping, lifting, moving, pressing, and pulling.



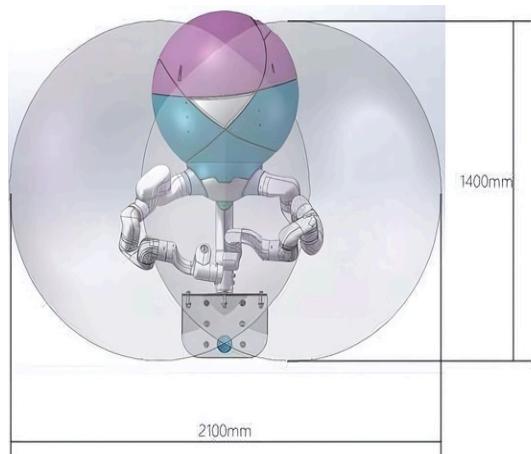
- **Integrated Control Brain:** Functioning like the human brain, it possesses learning and decision-making capabilities, coordinating and controlling the movements of the left and right mechanical arms.
- **Six-Axis Mechanical Arms:** With twelve degrees of freedom and 0.1mm repeatability positioning accuracy, they can easily perform actions in a multi-dimensional space within the arm's working range.
- **Perceptual Abilities:** Equipped with a panoramic camera, pre-installed hand-eye cameras in the robot gripper, and an upgraded voice recognition system, the robot's visual and audio perception capabilities are significantly enhanced, thereby supporting improvements in overall robot intelligence.

Using LUOBOT's dual-arm robot with its specialized training tool, Carrot Studio, enables the robot to master various operational skills. This includes making pour-over coffee like a barista, brewing kung fu tea with cup warming and rinsing like a tea master, and mixing various flavored cocktails like a bartender.

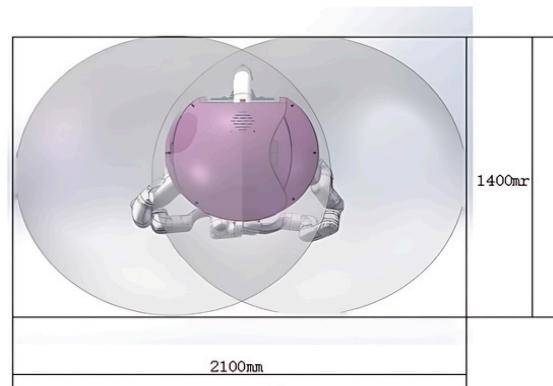
LUOBOT dual-arm A.I. robot is a general-purpose robot.

LUOBOT Dual-Arm A.I. Robot

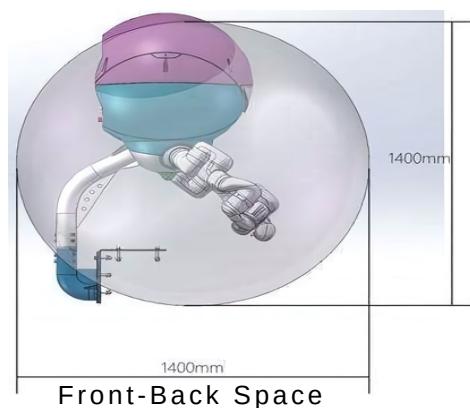
LUOBOT Dual-Arm A.I. Robot Operating Space



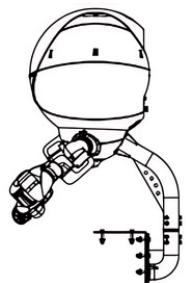
Left-Right Space (Front View)



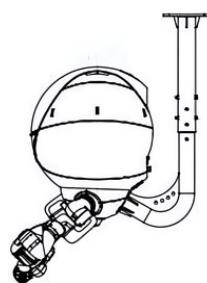
Left-Right Space (Top View)



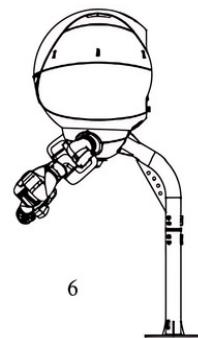
Flexible Mounting Methods



Side-mount



Top-mount



Upright-mounted

LUOBOT Dual-Arm A.I. Robot

Main Parameters and Operating Environment

Basic Parameters	
Weight	133.6 lb
Repeatability Positioning Accuracy	±0.004 in
Maximum Payload per Arm	11.02 lb × 2
IP Protection Rating	IP43
Control System	Integrated inside the robot
POWER	
Power Input Voltage	AC220V
Power Input Frequency	50-60Hz
Maximum Input Current	4A
Power Cable Length	10 ft
Operating Environment	
Operating Temperature	39-113°F
Operating Humidity	30%-70%RH
Operating Altitude	No higher than 6561.68 ft

Robot Training

Carrot Studio is a specialized training tool for robots, designed to impart operational skills tailored to client needs. After a brief training, clients can effectively use this tool to continually retrain robots, enhancing their operational skills for everyday tasks.

Work Like Humans

The robot operates like a human, requiring preparation and integration within the work environment.

**Robot work = Robot + End Effector (Gripper)
+ Work Environment Setup**

① Robot (Employee)

To perform operations according to the pre-trained skills.



② Gripper

To execute grasping and other hand movements according to the required skills of operation.



③ Work Environment Setup

Includes: workbench/equipment/tools and utensils needed for the robot's work



Workbench



Equipment



Tools & Utensils

Taking Robot Barista as an Example

**Robot Barista = Trained Robot+Adapted Gripper
+Work Environment Setup**

① Robot Barista

A general-purpose robot equipped with professional barista skills, the robot barista can be retrained to accommodate specific coffee-making techniques according to customer preferences, ensuring it meets diverse customer requirements.



② Gripper

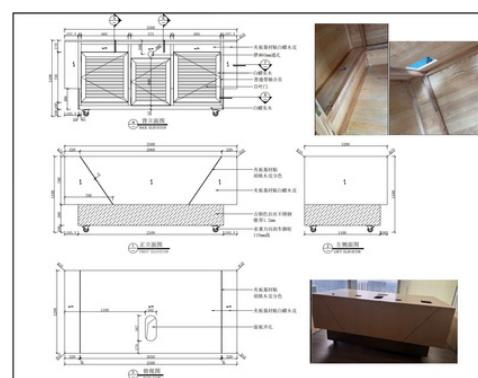
The robot barista's hand is comprised of robot gripper with fixtures adapted for operating coffee equipment and utensils.

③ Work Environment Setup

Includes workbench/grinder/ water heater and kettle/automatic filter paper device/smart cup holder /dry-wet separation waste disposal device/local network gateway, etc.

Coffee Workbench

The coffee workbench is a platform for the robot to make coffee at a fixed workstation. The equipment and utensils needed for making coffee are arranged on the workbench for easy access and operation by the robot.



Taking Robot Barista as an Example

Grinder

Industry-standard grinder. Can be sourced from third party.



Water Heater and Kettle

Commercial grade water heater to provide hot water for coffee making, kettle needs to be compatible with gripper or customized.



Automatic Filter Loader

The automatic filter loader includes an automatic filter paper rack and filter cup rack. The automatic filter paper device is customized for the robot barista.



Smart Cup Holder

The smart cup holder includes QR code recognition function (can recognize different SKU production instructions) and a dedicated cup holder (suitable for various cup types, convenient for robot to pick up). The smart cup holder is customized for the robot barista.



Taking Robot Barista as an Example

Dry-Wet Separation Waste Disposal Device

The dry-wet separation waste disposal device is placed inside the workbench to collect waste water and coffee grounds produced during the robot barista's coffee making process, as well as discarded coffee cups and other garbage from customers. It is a standard purchased item.



Supporting Devices

Includes accessories used for matching and integrating the robot with the work environment. Includes wireless gateway, water pump, equipment fixing parts, etc. Except for proprietary equipment fastening parts, all other items can be sourced through third party.



At this point, through on-site integration and installation, the robot barista can start work.



Our Proposal

Proposal Objectives

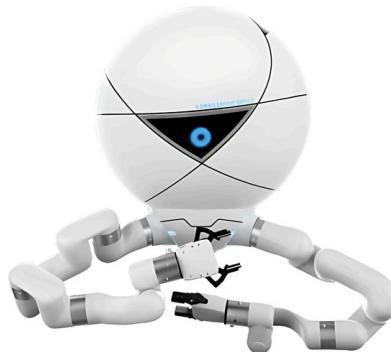
- A system for making pour-over coffee with a robot
- Produces both hot and iced coffee
- One set for PoC (Proof of Concept) validation

System Configuration Proposal

One Robot Barista

① FeN03 dual-arm robot

Price: \$150,000



② Gripper

LUOBOT robot universal gripper components (x Arm) 2 pieces

Price: \$8,000



Our Proposal

③ Supporting work environment (according to the current robot barista system standards)

Hardware	Specifications	Quantity	Price	3rd Pty.	Luobot
Workbench	Customized	1	\$5,000	✓	
Grinder	EK43s (Germany)	1	\$3,500	✓	
	C98PRO-DD (China)	1	\$1,000	✓	
Water Heater	Marco, 3L MIX UC3	1	\$2,600	✓	
Kettle	Luobot made	1	\$150		✓
Filter Loader	Luobot made	1	\$1,500		✓
Smart Cup Holder	Luobot made	1	\$650		✓
Waste Disposal Device	Luobot made	1	\$200		✓
Smart Gateway & Adapters	Luobot made	1	\$1,000		✓
Installation & Setup	Luobot provisioned	1	\$6,000		✓
Est. Cost of Supporting Work Environment		1	\$21,600		

Note: The above configuration does not include the possible need for an ice maker and ice storage equipment for making iced coffee.

In summary, the total cost of a robot barista coffee system is \$179,600

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Coffee Bean Loading Solutions

① Single Large Batch Loading

Coffee beans are loaded in batches into the grinder or bean counter hopper. The robot then dispenses a fixed amount of beans each time, operates the grinder, and collects the ground coffee.

Advantages:

Convenient operation.

Reduces the frequency of manual maintenance.

Drawbacks:

Only serve one type of coffee bean.

Hard to maintain the freshness of coffee bean.



② Multi-Individual Loading

Different coffee beans are pre-placed by staff into multiple independent coffee bean containers. During production, the robot selects the appropriate container, places the beans in the grinder, and then proceeds to make the coffee.

Advantages:

Accommodates multiple types of coffee beans.

Offers a wider variety of SKUs and flavors.



Disadvantages:

Requires additional independent coffee bean containers identification device (cost approximately \$1,000).

Increases manual preparation work.

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Iced Coffee Solutions

① Automatic Ice Maker Solution

Install a fully automatic ice maker in the work environment. The robot automatically dispense ice into a cup before proceeding with the pour-over coffee operation.

Advantages:

High degree of automation, no need for manual intervention from ice dispensing.

Disadvantages:

Increased configuration cost (around \$8,000) for the work environment;



② Auto-Manual Hybrid Solution

This solution requires human staff and robot to work synchronously. In manual mode, staff pour ice cubes into cups and then hand them to the robot for coffee making. In mode mode, the robot retrieves ice cubes from a specially designed ice storage container and pour them to the coffee cups.



Advantages:

Reduces configuration costs, aligns with customers' habit.

Disadvantages:

Requires the venue to have ice-making capabilities and an suitable ice storage device that is compatible with robot operation



Proposal Objectives

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PoC Verification Solutions

① Standard Product Verification Solution

Purchase and implement LUOBOT's existing robot barista system for verification. The current system offers pour-over coffee functionality, utilizes an independent coffee bean loading mode, and add ice manually.

Advantages:

Short setup/delivery cycle (25 days). Lower training and implementation costs.

Disadvantages:

Fixed workbench appearance may not align with Wynn's image, larger footprint, higher transportation cost.



② Customized Workbench Solution

Purchase only the LUOBOT dual-arm robot and the customized items specified in the environmental configuration, while the client prepares the workbench and other necessary hardware according to provisioned design.

Advantages:

The system's appearance can be tailored to align with client's brand image.

Accommodates personalized requirements.

Disadvantages:

Extended delivery cycle.

Higher implementation costs.



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④ Prototype PoC Solution

Prototype: LUOBOT dual-arm robot coffee system

Functions: Pour-over coffee + Tea brewing

SKU: Pour-over coffee 220ml/cup, 160ml/cup
Tea 220ml/cup

Environment: Power and operating environment
refer to "LUOBOT Dual-Arm Robot Main
Parameters and Operating Environment Table"

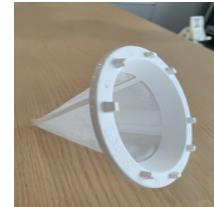
Space: Footprint and other spatial data refer to
attached "LUOBOT Dual-Arm Robot Coffee"
product manual

Consumables: Customer provides bottled water
and coffee beans, Luobot provides automatic filter
paper

Service: Includes transportation, disassembly/assembly, debugging, 1 staff
training session, 2 robot training sessions, 24-hour maintenance response

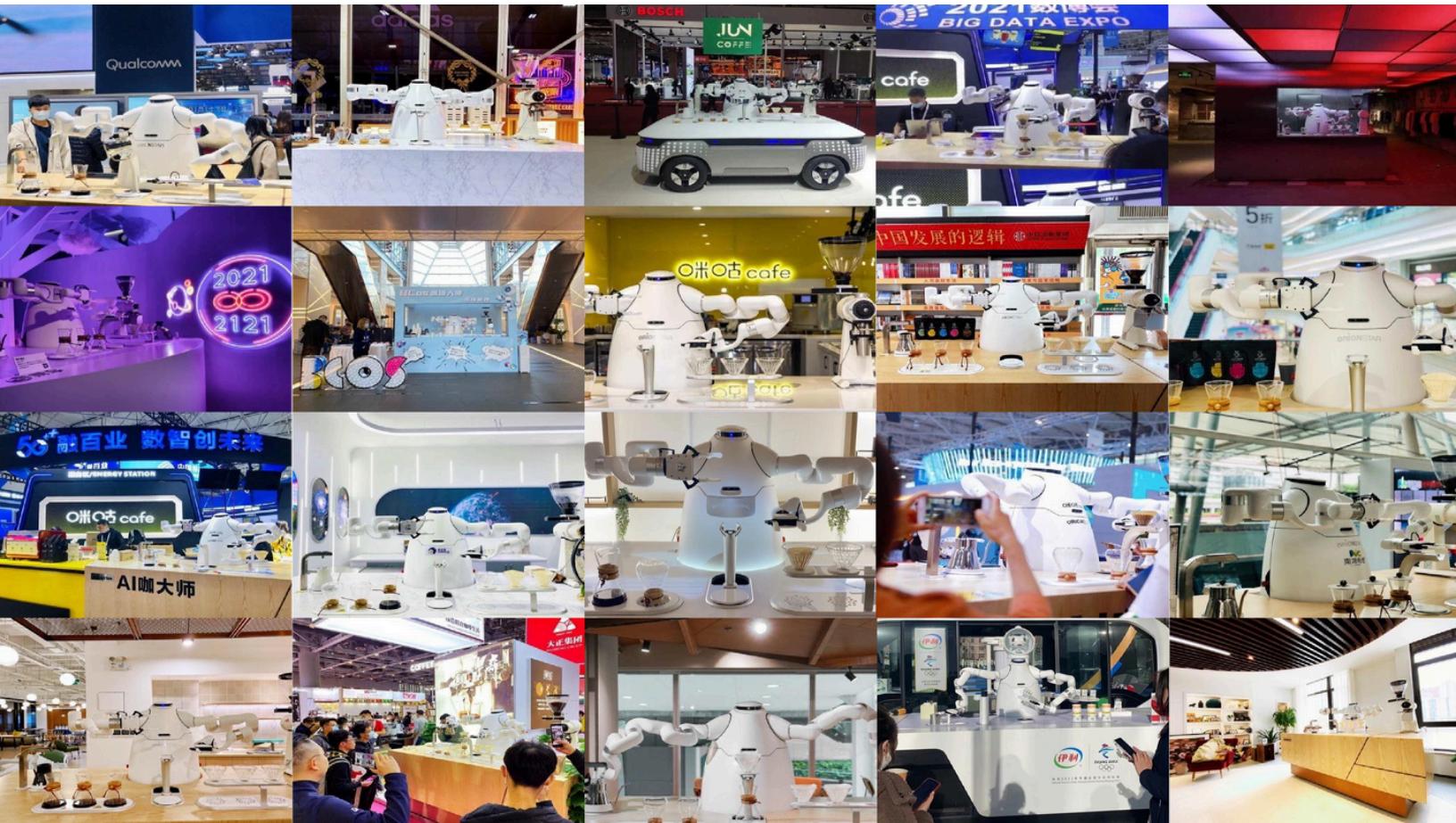
Cycle: Prototype delivery cycle is 15 days, PoC verification cycle is 60
consecutive days

Cost: PoC verification package cost \$10,000 (can be deducted from future
purchase price), 50% upfront deposit, balance due upon delivery.



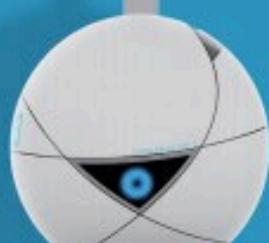


Delegate repetitive, tedious, heavy, and dangerous work to robots





- Low labor cost
- Fast & Efficient
- Zero contact



Save Space
Attract Attention



Sub-millimeter Stability

Tested over 30,000 hours, the dual-arm robot offers high precision and visual training for consistent, high-quality coffee making.

Flexible Modularity

Fully automated with intelligent systems for filtering and cleaning, reducing maintenance and costs.

Bionic Design

Mimics human movements with intelligent control, surpassing human capabilities in tight spaces.

Triple Efficiency

Occupying just 32 Sqft, it operates 24/7, producing 600 cups daily, with rapid cost recovery.

Fourfold Safety Protection

Features detection systems, 360° cameras, and emergency stop buttons for comprehensive safety.

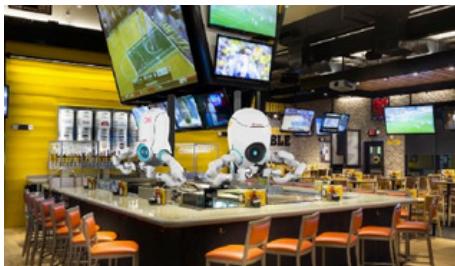
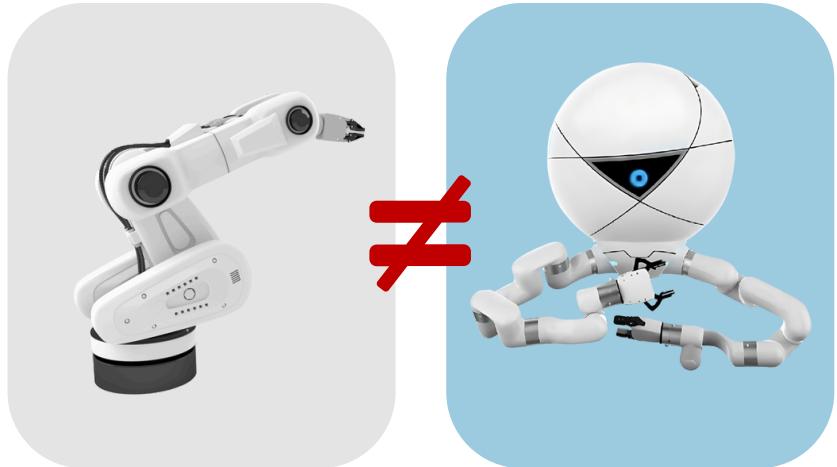
Comprehensive Service

Ready within 8 hours, supports multiple installation modes, ensures quality, and offers quick repairs with customizable solutions.

Let Every Corner of the World Taste Master-Level Coffee

Mechanical Arm Coffee Machine Doesn't equal to Robot Barista

Unlike conventional mechanical arms, the fully automated robot barista can achieve full automation from coffee beans to a good cup of coffee. The ingredients are fresh, ground and brewed on the spot, ensuring consistent quality.



Coffee Machine All-in-One Self-Service Parameter Table	
Item	All-in-One Version
Dimensions (L*W*H)	98.4" * 47.2" * 74.8"
Weight	595 lbs
Coffee Bean Type	Machine bean grinding
Ice Maker	Lifting ice cube ice maker (ice storage box, ice delivery port)
Water Tank	23.7 fl oz
Milk Container	Out of machine 15.2 fl oz
Cleaning Cycle	5-6 hours
Payment Method	Banknotes, coins, mobile payment, membership card
Input Voltage	AC 220V
Rated Power	4500W
Safety Certification	CE certified
Automatic Change Function	-
Automatic Cup Dispensing Function	-
Remote Management	√

Coffee Machine Base Parameters	
Operating Environment	Indoor temperature: 41°F - 95°F
Installation Height	29.5"
Base Dimensions	98.4" * 47.2" * 42.1"
Base Weight	441 lbs
Total Power	3.1kW
Input Voltage	AC 100-240V
Power (Hot water/Cold water)	Max 3500W / Min 500W
Maximum Current	Max 10A

CONTACT US
Luobot Technology
North America Distribution
(650) 489-5808
info@WeMake.cloud