

THE P.AI GAMES // WORLD CHAMPIONSHIP OF PHYSICAL AI



ARENA GUIDEBOOK

How every arena works — and how to plan for it

Edition 1.0 • For teams and applicants Tel Aviv, Israel • May 18-19, 2027

A plain-language companion to the Official Rulebook. Where they differ, the Official Rulebook and official bulletins prevail.

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HOW TO USE THIS GUIDEBOOK

This guidebook explains, in plain language, what each of the ten arenas asks of your machine, how it is scored and what can end a run — so you can choose your arenas and plan your build, testing and crew.

It is a companion to the Official Rulebook, the CAD Blueprint Briefs and the Autonomy & Safety Charter. Where anything here differs from those documents or from an official bulletin, the official documents prevail.

Rules, formats, dimensions, schedules and prizes may change at the organisers' discretion. The committee notifies registered teams of every change through official bulletins.

THE GAMES AT A GLANCE

- ▼ Ten arenas, A-01 to A-10. Each one has its own podium, its own prize money and its own world title.
- ▼ Enter as few as one arena or as many as all ten. There is no entry fee.
- ▼ Up to 12 teams per arena in the semi-finals on May 18. The top four to six advance to the Grand Finals on May 19, where the conditions get harder.
- ▼ Open to robotics companies, research labs, universities, startups, independent teams and joint syndicates — with your own robot or an accredited third-party, commercial or open-hardware platform.
- ▼ Software and AI teams without their own hardware are eligible and may ask the organisers for an introduction to a hardware partner.
- ▼ Robots do not need to be humanoid. Arm-plus-AMR and other safe mobile-manipulation set-ups are welcome.
- ▼ Teams keep 100% of their technology and intellectual property.

PRIZE MONEY

Every arena pays the same podium: US\$100,000 to the winner, US\$10,000 for second place and US\$2,500 for third place.

Prizes are paid after the telemetry audit, compliance confirmation and IP ownership certification, and remain subject to the official event rules.

	PER ARENA	TEN ARENAS
1st place	US\$100,000	US\$1,000,000
2nd place	US\$10,000	US\$100,000
3rd place	US\$2,500	US\$25,000
Total cash prizes		US\$1,125,000

YOUR TIMELINE

- ▼ Apply online at pai-games.com/register. A person on the Race Control team reviews every application for safety, eligibility and arena fit, and writes back personally.
- ▼ May 17 — Scrutineering day, teams only, from 06:30: mass inspection, radio clearance, dual-channel emergency-stop validation, battery containment audit, team briefing and a walk of all ten arenas. Robots enter parc fermé at 20:00.
- ▼ May 18 — Semi-finals. The team floor opens at 07:00 for diagnostics and practice. Spectator gates open at 14:00 and the semi-finals run through the afternoon and evening.
- ▼ May 19 — Grand Finals. Finalist teams from 07:00. The Grand Finals run through the afternoon, with the podium awards at 18:30 and the closing ceremony at 19:15.
- ▼ All times are planned Israel times and may change. Your exact running slot is confirmed after scrutineering.

RULES THAT APPLY IN EVERY ARENA

- ▼ The Adaptive Standard: most recoverable mistakes add time (+5 s or +10 s) instead of ending the run, and precision can earn time back (−5 s or −10 s) where an arena's rules say so.
- ▼ Red flags: officials may pause or stop any run for an uncontained hazard, loss of control, fire risk, structural failure or a risk to spectators.
- ▼ Declared teleoperation is allowed in the inaugural Games. Any active human assistance adds +60 s to the run time; in A-06, 60 s comes off the robot's own chess clock instead. Undisclosed human input is a rules violation.
- ▼ Declare your control mode before each run. Read-only telemetry does not count as teleoperation.
- ▼ A maximum of five credentialed crew may be inside the live arena perimeter during a heat, including a named safety and emergency-stop lead. Each extra person adds +10 s to that run.
- ▼ Every robot needs a physical, dual-channel emergency stop that both the team and the officials can reach, declared energy, speed, tool and effector limits, and battery documentation that matches its chemistry.
- ▼ After parc fermé, no software or hardware changes are allowed without a steward ticket, and overnight repairs must be declared.



A-01

PRIZE MONEY IN THIS ARENA

1st place	2nd place	3rd place
US\$100,000	US\$10,000	US\$2,500

TACTILE DEXTERITY & MICRO-SLIP MANIPULATION

THE PORCELAIN PROTOCOL

Load ten oily plates, glasses and cutlery into a dishwasher in eight minutes.

CLOCK 8 MIN CEILING	DIFFICULTY Tier 2 of 3	TO THE GRAND FINAL Top 6	RANKED BY Lowest net time	TYPICAL SENSING Tactile fingertips + micro-slip
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THE TASK

Fine-grain tactile loading of ten fragile, oil-slicked items — 4 porcelain plates, 2 long-stem crystal glasses and 4 metal cutlery pieces — from a chaotic bussing cart into a commercial dishwasher.

SEMI-FINAL • MAY 18

Load all 10 items within an 8-minute maximum ceiling. Top 6 advance.

EQUIPMENT AND REQUIREMENTS

- 4 thin porcelain plates (24cm), 2 long-stem crystal glasses (22cm) and 4 stainless forks and spoons, all oil-slicked
- Tactile fingertips and micro-slip recovery permitted
- Acoustic floor sensors flag any impulse above 85dB

THE ARENA

Commercial multi-rack under-counter dishwasher with lower and upper racks extended, a stainless bussing cart of 10 vegetable-oil-coated items and acoustic floor sensors around the cell.

GRAND FINAL • MAY 19

Full load against an accelerated clock under variable soapy surface spray. Lowest net time wins.

SCORING, BONUSES AND PENALTIES

- 5s time bonus for each item securely seated in its tines, allowing smooth unobstructed closure of racks and door
- +5s penalty for a misaligned item blocking the drawer, a cracked plate or glass, an acoustic spike above 85dB, or a dropped item
- +60s penalty for any active teleoperation assistance

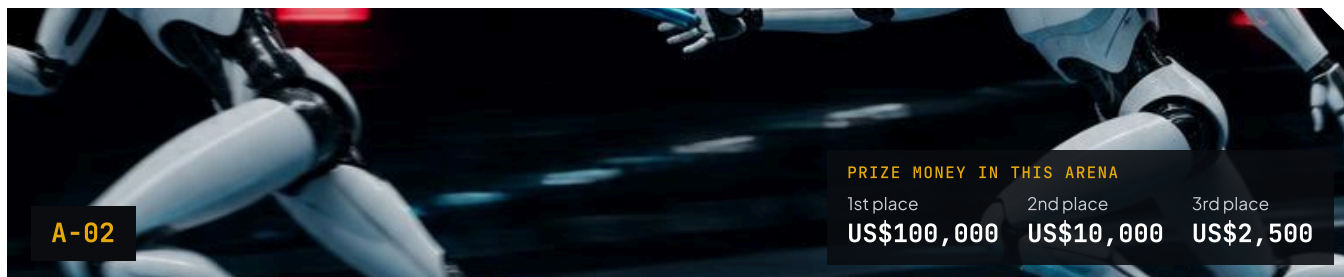
WHAT STOPS OR VOIDS A RUN

None in the heats — under the Adaptive Standard a cracked plate costs +5s, not the run. A red flag is reserved for a catastrophic, uncontained arena hazard.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- Rehearse with oil-coated plates, glasses and cutlery — dry practice items won't prepare your grip for the real thing.
- Each item seated cleanly in the tines earns -5 s, while a drop, a crack or a sound above 85 dB costs +5 s. Ten clean placements beat raw speed.
- Plan a separate grasp for the long-stem crystal glasses.
- The Grand Final adds soapy surface spray against a faster clock, so test on wet, soapy surfaces too.



MULTI-AGENT KINEMATICS & HIGH-SPEED SPATIAL HANDSHAKE

THE RELAY SYNC

Pass a baton between two moving robots over a 20-metre sprint.

CLOCK 20M SPRINT	DIFFICULTY Tier 3 of 3	TO THE GRAND FINAL Top 4	RANKED BY Lowest net sprint time	TYPICAL SENSING Stereo vision + relative pose tracking
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THE TASK

A 20m high-speed indoor sprint in two 10m sectors. Sprinter Alpha launches with an anodized gold baton and hands it to Sprinter Beta inside a 6m dynamic exchange zone (meters 7-13) — with both machines in forward motion.

SEMI-FINAL • MAY 18

Individual timed sprints with the moving handover. Top 4 advance.

EQUIPMENT AND REQUIREMENTS

- Two machines per team: Sprinter Alpha (starter) and Sprinter Beta (receiver)
- Aerospace anodized gold baton: 30cm long, 3.5cm diameter, 200g
- The physical handover must occur while both machines move forward

THE ARENA

20m indoor straightaway split into two 10m running sectors, a laser-gated 6m exchange zone (m 7.00-13.00), 2.5m lanes and electronic timing gates.

GRAND FINAL • MAY 19

Head-to-head dual-lane sprint duel with a continuous 35 km/h lateral crosswind fan buffeting the exchange zone.

SCORING, BONUSES AND PENALTIES

- Net elapsed sprint time from the starting siren to Beta crossing the finish threshold, timed to 0.001s
- +10s penalty for a handover initiated or completed outside the 6m exchange zone
- +5s penalty for a dropped baton (retrieval permitted), a chassis collision or a lane boundary breach
- +60s penalty for any active teleoperation assistance

WHAT STOPS OR VOIDS A RUN

None in the heats — a dropped baton is a +5s penalty and the sprint stays alive. Red flags are reserved for uncontained hazards.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- You need two working machines: Sprinter Alpha starts with the baton and Sprinter Beta finishes.
- The handover must happen with both machines moving forward and inside the 6 m exchange zone (metres 7-13). Outside the zone costs +10 s.
- A dropped baton costs +5 s and may be picked up again, so rehearse the recovery.
- Only the top four advance, and the Grand Final adds a 35 km/h crosswind across the exchange zone.



HIGH-VELOCITY TRACTION DYNAMICS & REACTIVE DRIFT CONTROL

THE KINETIC OVERDRIVE

Race autonomous vehicles wheel to wheel on a closed-loop circuit.

CLOCK FLYING LAP → 5 LAPS	DIFFICULTY Tier 3 of 3	TO THE GRAND FINAL Top 6	RANKED BY Finishing order + penalties	TYPICAL SENSING LiDAR + IMU + wheel odometry
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THE TASK

An autonomous crazy-car grand prix on an 80m indoor closed-loop asphalt circuit with high-friction stretches and a narrow chicane lined with illuminated, energy-absorbing barriers. 1:4 scale platforms or electric karts capped at 15kW.

SEMI-FINAL • MAY 18

The Flying Lap: one warm-up lap, then a single official flying lap against the clock. Top 6 advance.

EQUIPMENT AND REQUIREMENTS

- 1:4 scale autonomous platforms or custom electric racing chassis, power capped at 15kW
- Fully onboard driving during the race
- Optical transponder fitted by race control

THE ARENA

80m indoor closed-loop asphalt circuit (4.0m wide) with dry high-friction asphalt, a neon-lined transition chicane, energy-absorbing barriers and pneumatic pop-up ramps.

GRAND FINAL • MAY 19

Six-car simultaneous grid start for a 5-lap sprint race with pop-up obstacles deploying at randomized intervals.

SCORING, BONUSES AND PENALTIES

- Grand Final ranking by order of finish across the transponder line
- +10s penalty for an unrecovered spin-out or track obstruction exceeding 10 seconds
- +60s penalty for any active teleoperation assistance

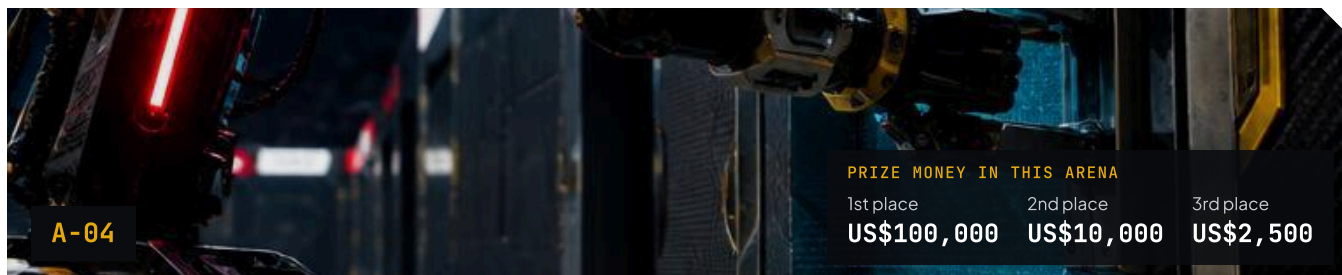
WHAT STOPS OR VOIDS A RUN

An uncontrolled boundary impact registering above 4G deceleration, or an uncontained electrical fire hazard.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- The semi-final is one warm-up lap and one timed flying lap: tune for a single clean, fast lap.
- The Grand Final is a six-car, five-lap race with pop-up obstacles at random intervals. Plan for wheel-to-wheel racing and fast obstacle reaction, not lap time alone.
- Driving must be fully on board during the race, with power capped at 15 kW.
- An unrecovered spin or a blockage of more than 10 seconds costs +10 s; a boundary impact above 4G ends the run.



MECHANICAL PROBLEM SOLVING & DYNAMIC TORQUE REGULATION

THE THRESHOLD BREACH

Open three unfamiliar doors and cross a sealed corridor.

CLOCK 6 MIN CEILING	DIFFICULTY Tier 2 of 3	TO THE GRAND FINAL Top 6	RANKED BY Lowest net breach time	TYPICAL SENSING Torque feedback + 3D kinematics
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THE TASK

A 15m sealed corridor gated by three full-height doors: a hydraulic commercial-glass door with 45N push-bar resistance, an armored steel deadbolt door with a 90-degree rotary handle and unmapped upper slide-bolt, and a 60kg track-mounted sliding panel with a recessed finger pocket.

SEMI-FINAL • MAY 18

Breach and traverse all three doors within a 6-minute ceiling. Top 6 fastest machines advance.

THE ARENA

15m sealed tunnel partitioned by three full-height (2.1m) doors — hydraulic glass, armored deadbolt, 60kg slider — with strain gauges on every handle and an exit boundary optical beam.

GRAND FINAL • MAY 19

Consecutive rapid breach through all three doors under live randomized latch tension and an unmapped secondary resistance.

EQUIPMENT AND REQUIREMENTS

- Door 1: hydraulic glass with a 45N continuous spring-hydraulic push bar
- Door 2: 90-degree rotary deadbolt plus an unmapped upper slide-bolt
- Door 3: 60kg lateral sliding panel with a narrow recessed finger pocket

SCORING, BONUSES AND PENALTIES

- Net elapsed time from the start line to tripping the exit boundary optical beam
- +10s penalty for cracked glass, structural damage to a door or handle, or a stationary stall beyond 90 seconds
- +60s penalty for any active teleoperation assistance

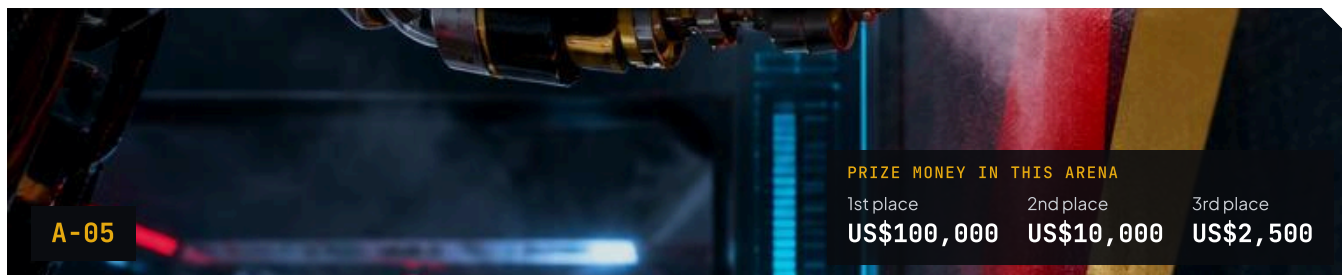
WHAT STOPS OR VOIDS A RUN

None in the heats — cracked glass and damaged latches cost +10s while the breach continues. Red flags are reserved for uncontained hazards.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- Three different mechanisms: a 45 N push-bar glass door, a deadbolt with a 90-degree rotary handle, and a 60 kg sliding panel with a recessed finger pocket.
- Door 2 has an upper slide-bolt that is deliberately not on the map. Look for it.
- Cracked glass, door damage or a stall longer than 90 seconds each cost +10 s. Control your force rather than forcing the door.
- In the Grand Final the latch tension changes at random and an unmapped extra resistance is added.



SURFACE COVERAGE, VISCOSITY MODELING & BOUNDARY SEGMENTATION

PRECISION COATING

Paint a geometric wall precisely without touching the glass or fixtures.

CLOCK TIME + ARTISAN BONUS	DIFFICULTY Tier 2 of 3	TO THE GRAND FINAL Top 6	RANKED BY Net time with artisan bonus	TYPICAL SENSING Viscosity flow + edge segmentation
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THE TASK

Paint a 2.0m × 2.5m architectural drywall carrying an intricate colorful geometric mandala layout, one de-energized sealed socket mock-up, a de-energized toggle-switch mock-up and a 50×50cm frameless glass pane — with open tooling: airless spray, 9-inch rollers or 2-inch angle brushes.

SEMI-FINAL • MAY 18

Clean coating of the central base pattern. Top 6 fastest machines with uniform layer distribution advance.

EQUIPMENT AND REQUIREMENTS

- Any autonomous tooling: airless sprayers, 9-inch micro-rollers, 2-inch angled trim brushes
- Vibrant water-based acrylic pigments supplied by race control
- No masking tape, stencils or shields

THE ARENA

2.0m × 2.5m matte-white pre-primed drywall with an outlined mandala, de-energized sealed socket and switch mock-ups, a flush 50×50cm frameless glass pane and an overhead spectrophotometer. No live electrical conductors are present in the competition cell.

GRAND FINAL • MAY 19

100% coverage of the full intricate mandala, including micro-edge cutting around the socket, switch and glass.

SCORING, BONUSES AND PENALTIES

- 10s time bonus for uniform coverage above 95% of the target area with zero unpainted dry patches (spectrophotometer verified)
- +10s penalty for any paint droplet on the bare glass pane or paint intrusion into the sealed socket mock-up
- +60s penalty for any active teleoperation assistance

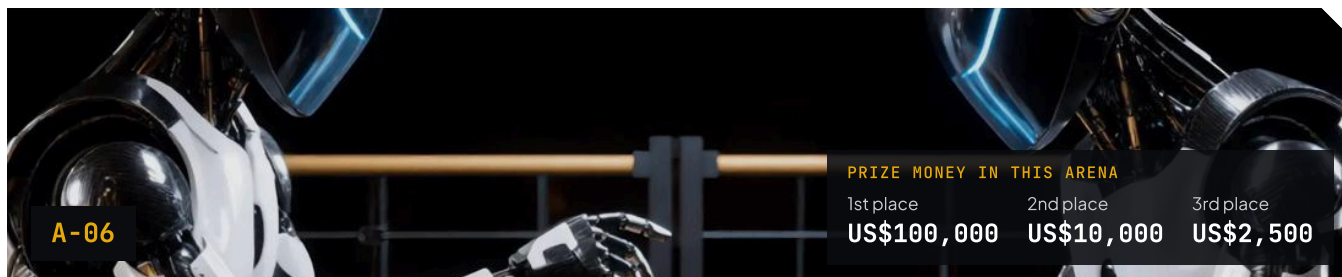
WHAT STOPS OR VOIDS A RUN

None in the heats — a speck on the glass costs +10s, not the run. Red flags are reserved for uncontained hazards.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- Bring your own tooling: an airless sprayer, 9-inch rollers or 2-inch angled brushes. The paint is supplied.
- No masking tape, stencils or shields are allowed, so edge accuracy has to come from your machine.
- Uniform coverage above 95% with no dry patches earns –10 s; paint on the glass or in the socket mock-up costs +10 s.
- The Grand Final covers the whole mandala, including the fine edges around the socket, the switch and the glass. The fixtures are sealed, de-energized mock-ups.



ROBOT-VS-ROBOT CHESS · STRATEGIC REASONING & DEXTEROUS PIECE CONTROL

THE GRANDMASTER GAMBIT

Two robots face off over a real chessboard — move the pieces, hit the clock, checkmate.

CLOCK 10+5 RAPID → 3+2 BLITZ	DIFFICULTY Tier 3 of 3	TO THE GRAND FINAL Top 6	RANKED BY Match points + tiebreaks	TYPICAL SENSING Overhead + wrist vision · piece recognition
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THE TASK

Robot versus robot over a real tournament chessboard. Each machine reads the position with its own cameras, picks up weighted Staunton pieces, captures, castles, promotes — and hits its own clock. No screens, no digital board: every move is a physical act, and every second on the clock is real.

SEMI-FINAL · MAY 18

Up to 12 robots play three Swiss-system rapid rounds (10 min + 5 s per move). Win 1 · draw ½ · loss 0. Top 6 on points advance.

EQUIPMENT AND REQUIREMENTS

- ▶ The robot moves every piece itself — pick, place, capture, castle and promote — and presses its own clock
- ▶ Board perception from onboard cameras only; no electronic board or digital move feed
- ▶ Any chess intelligence the team brings — its own engine or model — must be declared at scrutineering

THE ARENA

Centre-stage chess table between two facing robot cells, a regulation tournament board (55mm squares), weighted Staunton pieces (95mm king), a physical digital chess clock and overhead cameras driving the giant live board on the jumbotrons.

GRAND FINAL · MAY 19

The top 6 meet in a blitz round-robin (3 min + 2 s) on the centre-stage board. A tie for first is settled by an Armageddon decider — white must win, a draw crowns black.

SCORING, BONUSES AND PENALTIES

- ▶ Match points: win 1 · draw ½ · loss 0, with Buchholz and head-to-head tiebreaks
- ▶ Touch-move applies. A knocked-over piece must be restored by the robot on its own clock; a first illegal move gives the opponent +1 minute, a second illegal move loses the game
- ▶ Declared teleoperation: 60 seconds deducted from that robot's own clock each time it is used

WHAT STOPS OR VOIDS A RUN

None for a fumble — a toppled piece costs clock time, not the game. Flag fall loses on time. Red flags are reserved for uncontained hazards or a robot reaching into the opponent's cell.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- ▶ Your robot must read the board with its own cameras, move every piece itself — including captures, castling and promotion — and press its own clock. There is no electronic board.
- ▶ Declare your chess engine or model at scrutineering.
- ▶ The semi-final is three Swiss rounds at 10 minutes + 5 seconds; the final is a blitz round-robin at 3 minutes + 2 seconds, where physical move speed matters most.
- ▶ Touch-move applies and toppled pieces are restored on your own clock. A first illegal move gives the opponent +1 minute; a second loses the game. Never reach into the opponent's cell.



UNSTRUCTURED SPATIAL MAPPING & DYNAMIC RE-ROUTING

THE UNSEEN LABYRINTH

Map an unseen maze and find the exit as the walls change.

CLOCK 3 MIN → 2.5 MIN	DIFFICULTY Tier 3 of 3	TO THE GRAND FINAL Top 6	RANKED BY Lowest escape time	TYPICAL SENSING LiDAR SLAM + depth + IMU
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THE TASK

A 100m² enclosed maze built from motorized modular partitions. The layout is scrambled 60 seconds before launch, and once the robot is inside, selected corridors shift to create sudden dead-ends under strobe interference.

SEMI-FINAL • MAY 18

The static layout is randomized 60 seconds before launch; navigate to the IR beacon within 3 minutes. Top 6 advance.

EQUIPMENT AND REQUIREMENTS

- ▶ No prior map, fiducials or GPS
- ▶ Onboard LiDAR, depth and IMU mapping
- ▶ Layout scrambled 60 seconds before launch; walls shift live in the final

THE ARENA

100m² enclosed sector (10m × 10m) of 1.8m modular partitions on motorized ceiling tracks, rubber traction ramps, cobblestone pavers, low foam baffles, strobe lighting and an optical IR beacon exit.

GRAND FINAL • MAY 19

Live dynamic rerouting: motorized partitions shift mid-run to close the primary corridor, forcing autonomous retreat and recalculation under a 2.5-minute clock.

SCORING, BONUSES AND PENALTIES

- ▶ Lowest net escape time from the entrance gate to the exit beacon
- ▶ +10s penalty for a physical collision or abrasive scrape against a boundary wall
- ▶ +60s penalty for any active teleoperation assistance

WHAT STOPS OR VOIDS A RUN

A continuous stall beyond 45 seconds in a dead-end without attempting recovery, or structural collapse of a partition panel.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- ▶ There is no prior map, no fiducials and no GPS: everything is mapped on board.
- ▶ The layout is scrambled 60 seconds before launch, and in the Grand Final walls move during the run.
- ▶ A collision or scrape costs +10 s. A stall of more than 45 seconds in a dead-end without a recovery attempt ends the run, so build a strong recovery behaviour.
- ▶ Expect strobe lighting, rubber ramps, cobblestone pavers and low foam baffles.



WHOLE-BODY BALANCE & REAL-TIME INERTIAL DECOUPLING

THE WAITER RUN

Carry a tray of water and an egg across ramps without spilling.

CLOCK 90 SEC WINDOW	DIFFICULTY Tier 2 of 3	TO THE GRAND FINAL Top 6	RANKED BY Speed + water retained	TYPICAL SENSING IMU + force-torque wrist
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THE TASK

The classic catering nightmare: carry an aluminum tray holding 3 brim-full cups of fluorescent blue water (300ml each) and one raw egg in a 5mm shallow cup across a 12m course — 4m of flat track, then a 15° ramp up and down.

SEMI-FINAL • MAY 18

Negotiate the flat track and the ramp within a 90-second window. Top 6 advance.

EQUIPMENT AND REQUIREMENTS

- 35cm circular aluminum tray, 3 glass tumblers (300ml each) and a fresh raw egg supplied by race control
- Any walking, wheeled or mixed platform
- Water measured on the finish-line precision digital scale

THE ARENA

12m course: 4m flat track plus a 15° inclined/declined bridge ramp, a 15cm curb step in the final, arena subwoofer floor rumble and a precision digital scale at the finish line.

GRAND FINAL • MAY 19

Full course including the added 15cm urban curb step while subwoofers emit low-frequency floor vibrations.

SCORING, BONUSES AND PENALTIES

- +10 pts per 10ml of retained fluid, weighed on the finish-line precision scale
- +1 pt per full second remaining on the master clock
- +60s penalty for any active teleoperation assistance

WHAT STOPS OR VOIDS A RUN

The egg rolls off the tray and cracks on the floor, or a total drop of the service tray.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- The tray, glasses, water and raw egg are supplied. Any walking, wheeled or mixed platform may enter.
- Score is +10 points per 10 ml of water kept and +1 point per second left on the clock: balance speed against spill.
- A broken egg on the floor or a dropped tray ends the run.
- Test on 15° ramps. The Grand Final adds a 15 cm curb step and low-frequency floor vibration.



INERTIAL LOAD MANAGEMENT & HIGH-MOMENTUM BALLISTIC RELEASE

THE PINBREAKER STRIKE

Roll a heavy bowling ball toward ten pins under spotlights.

CLOCK	DIFFICULTY	TO THE GRAND FINAL	RANKED BY	TYPICAL SENSING
2 → 3 FRAMES	Tier 2 of 3	Top 6	Pinfall + speed bonus	Vision + joint torque

THE TASK

A regulation 15m USBC-grade oiled hardwood bowling lane with 10 solid maple tournament pins. The machine grasps a slick 14 lb (6.35kg) smooth urethane ball with no finger holes, advances to the foul line and releases a fluid pendulum swing.

SEMI-FINAL • MAY 18

Two frames (up to four ball deliveries). Top 6 cumulative pinfall totals advance.

EQUIPMENT AND REQUIREMENTS

- Regulation 14 lb (6.35kg) smooth urethane ball with no pre-drilled finger holes
- Robot must grasp and release the ball itself — no ramps or launchers
- Radar guns and a foul-line sensor judge every delivery

THE ARENA

15m regulation oiled hardwood lane (1.05m wide) with side gutters, 10 maple tournament pins, a foul-line sensor and arena radar speed guns.

GRAND FINAL • MAY 19

Three full frames under focused theatrical spotlights and amplified crowd audio.

SCORING, BONUSES AND PENALTIES

- Standard international bowling scoring — strike up to 30 pts per frame, spare up to 20
- +15 pts radar bonus for any legal delivery launching above 25.0 km/h
- +60s penalty for any active teleoperation assistance

WHAT STOPS OR VOIDS A RUN

The chassis crosses the foul line during release, or the ball is lofted more than 1.0m into the air — the frame is voided.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- The ball is a smooth 14 lb (6.35 kg) urethane ball with no finger holes. Your robot must grasp and release it itself — no ramps or launchers.
- Crossing the foul line during release, or lofting the ball more than 1.0 m, voids the frame.
- Any legal delivery above 25.0 km/h earns a +15-point bonus.
- The semi-final is two frames (up to four deliveries); the Grand Final is three frames under spotlights and crowd noise.



MOVING TARGET TRACKING, EYE-HAND COORDINATION & RAPID STRIKE

THE BURST CIRCUIT

Strike moving balloons on a rotating carousel in sixty seconds.

CLOCK 60 SEC	DIFFICULTY Tier 3 of 3	TO THE GRAND FINAL Top 6	RANKED BY Pops + combo bonus	TYPICAL SENSING High-speed vision + target prediction
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THE TASK

A 2.5m rotating vertical carousel driven between 5 and 25 RPM carries 12 heavy-duty balloons: 6 filled with fluorescent dyed water and 6 with metallic foil confetti. The robot intercepts them with an approved 15cm blunt-tip wand.

SEMI-FINAL • MAY 18

Fixed 8 RPM single-direction rotation: burst a minimum of 6 balloons within 60 seconds. Top 6 advance.

EQUIPMENT AND REQUIREMENTS

- ▶ Robotic arm fitted with an approved 15cm rigid blunt-tip puncture wand
- ▶ 12 heavy-duty 12-inch balloons: exactly 6 fluorescent-water and 6 metallic-confetti targets; no airborne pigment powder
- ▶ Every pop is confirmed optically and acoustically

THE ARENA

2.5m vertical circular carousel on an industrial servo drive (5–25 RPM) with 12 balloon mounts, strobe lighting and optical + acoustic pop sensors.

GRAND FINAL • MAY 19

Random variable speed with forward/reverse rotation alternation under strobe lighting.

SCORING, BONUSES AND PENALTIES

- ▶ +25 pts per verified burst target, confirmed optically and acoustically
- ▶ +50 pts combo bonus for intercepting 3 consecutive targets in under 10 seconds
- ▶ +60s penalty for any active teleoperation assistance

WHAT STOPS OR VOIDS A RUN

Mechanical jamming of the wand into the rotating hub mechanism, or 4 consecutive missed strikes impacting the steel structural frame.

PLANNING NOTES

Advice from the organisers to help you prepare. The rules on this page are what count.

- ▶ Fit an approved 15 cm rigid, blunt-tip wand to your arm.
- ▶ The semi-final runs at a fixed 8 RPM in one direction: burst at least six balloons in 60 seconds.
- ▶ Each verified burst scores +25 points, and three in a row inside 10 seconds adds a +50-point combo.
- ▶ The Grand Final changes speed and direction at random under strobe light. Jamming the wand in the hub, or four misses in a row that hit the steel frame, ends the run.

PLANNING CHECKLIST

- ▼ Pick your arenas: one, several or all ten. Every arena awards its own prize money.
- ▼ Check your platform against the equipment and requirements on each arena page.
- ▼ Rehearse in the real conditions: oily dishes, crosswind, strobe light, soapy spray, moving walls.
- ▼ Decide the control mode for each arena and practise declaring it.
- ▼ Name your crew of up to five, including your safety and emergency-stop lead.
- ▼ Prepare emergency-stop, battery and lithium freight paperwork (UN3480/UN3481) for scrutineering.
- ▼ Read the Official Rulebook and the CAD Blueprint Briefs, and watch for official bulletins.

Questions about an arena? Write to team@pai-games.com. Official documents: pai-games.com/arenas