



Robot PU and remote control

Walk. Autopilot. Dance. Balance. Code.

A complete, classroom-ready robot built on the **BBC micro:bit V2**. From elementary classrooms to high-school robotics clubs, Robot PU turns abstract STEM concepts into hands-on, creative projects. Two ready-to-use software options are available: a beginner track for younger students and an advanced track with more sensors, actuators, and control challenges. Add the optional **CogniCap** to unlock AI camera, SLAM, face tracking, and autonomous robot soccer.

What's in the Kit

- Robot PU body (pre-built & upgradable)
- Gamepad for remote control
- 2 × micro:bit V2-compatible boards
- Access to 100+ online tutorials, games & projects
- Standard pins and holes for 3D-printed and custom add-ons

Three Coding Paths

Blocks	Drag-and-drop MakeCode blocks
JS/TS	JavaScript / TypeScript
Python	Python

Optional: CogniCap with ESP32-S3 for AI

Put on the CogniCap to unlock AI vision, voice commands, SLAM, and autonomous robot soccer. *Sold separately.*



Move & Express

Walk, turn, step sideways, kick, jump, and rest. Dance to music. Talk and sing with a friendly robot voice. Blinking LED eyes show mood and personality.



Explore & Navigate

Roams around obstacles, solves simple mazes, follows a line or path, and can trail a leader. Great for teaching problem solving and spatial reasoning.



Sense & Balance

Uses distance and tilt sensors to stay upright, avoid bumps, and react to sounds. Self-balancing motion keeps it steady on the desk or floor.



Teamwork & AI

Robots can chat by radio, sing together, and play team games. Add the CogniCap camera to try face recognition, object tracking, and robot soccer.

- Amazon:** <https://amazon.com/dp/B0DR8RGVXN>
- Website:** <https://robotgyms.com/pu>
- YouTube:** The Story of PU (<https://youtube.com/@TheStoryofPu-yw8tr>)
- Open Source:** <https://github.com/robotgyms/pxt-robotpu>
- MakeCode:** <https://makecode.microbit.org>
add extension robotgyms/pxt-robotpu



Meet PU!

🎓 Ages 8–10 Beginner • Ages 11–13 Intermediate • Ages 14–17 Advanced • Difficulty: ★ Beginner ★★ Intermediate ★★★ Advanced

🔧 Setup & Basics

- ★ Project skeleton
- ★ Hello world demo
- ★★ JavaScript quick start

🔧 Build & Calibration

- ★ Add arms
- ★ Servo trim calibration
- ★ Material specifications

🤖 Robot Hardware & Behaviors

- ★ How Robot PU moves
- ★ Robot actions
- ★★ Robot observation
- ★★ Avoid collisions

🎵 Music, Speech & Expression

- ★ Music + beat-driven behaviors
- ★ Dance choreography
- ★★ Music library utilities
- ★★ Emotion state to expression
- ★★ RoboVoice melodic speech
- ★★ Synchronized singing

🎮 Fun Projects

- ★★ Kung Fu pose sequence
- ★★★ Learn to skate

📶 Communication & Control

- ★ Remote control
- ★ Gamepad patterns
- ★★ Peer chat over radio

🔗 Programming Structure

- ★★ Event loop
- ★★ Custom events & handlers
- ★★ State machines
- ★★ State switch (setMode)
- ★★ Object-oriented design

📖 Navigation & Mapping

- ★★ Sonar operator
- ★★ Maze solving
- ★★ Autopilot navigation
- ★★ 2D mapping concepts
- ★★★ Submarine sonar project
- ★★★ Leader-following
- ★★★ Occupancy grid
- ★★★ Shared mapping
- ★★★ Path planning
- ★★★ Path following

🏗️ Advanced Systems

- ★★ Robots as different roles
- ★★ Sharing messages
- ★★ Move commands
- ★★ Health checks
- ★★★★ Activity logging
- ★★★★ Safety stop
- ★★★★ Fault Recovery
- ★★★★ Behavior plans
- ★★★★ Mission plans
- ★★★★ Team formations

📊 Math & Stability

- ★★★★ PID feedback control
- ★★★★ Smoothing sensor readings
- ★★★★ Balance with one leg
- ★★★★ Balance on uneven ground

📷 CogniCap: AI Vision/Voice/RL

- ★★★★ Robot soccer with SLAM
- ★★★★ Detect faces and show emotions
- ★★★★ Follow objects
- ★★★★ Real-time mapping
- ★★★★ Sensor fusion
- ★★★★ Robot navigation
- ★★★★ Voice control
- ★★★★ Q-table



ROBOT GYMS

The Story of PU Learning Books

Book 1 Manual | Book 2 Games |
Book 3 Tutorials | Book 4 DIY Projects |
Book 5 PU Community

<https://robotgym.com/robotgym>



Amazon



YouTube



GitHub
(Block)



GitHub
(Py)



GitHub
(AI Cap)

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