Introduction to
AI Quadruped Racing Game

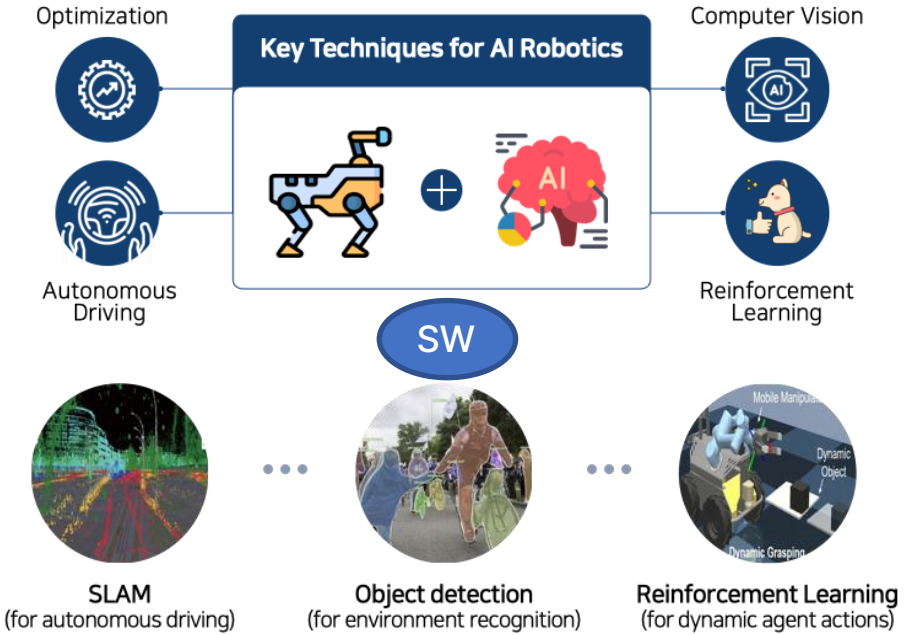
Provided on March 28, 2024

Why Quadruped Robot?

Type	Usage	Strength	Weakness
 Humanoid	Boston Dynamics, Tesla For research and demonstration	Human-like behavior	Hard to balance Requires large computation power
 Wheel robot	SECOM, Knightscope, Hyundai For delivery, service, patrol, etc.	Easy to use	Difficult to overcome rough terrain
 Drone	DJI, Flytbase, Amazon For delivery, surveillance, agriculture, etc.	Can avoid traffic through flight	Flight time limitation due to battery capacity
 Quadruped Robot	Anymal, Boston Dynamics, Unitree, Ghost Robotics For research, surveillance, inspection, etc.	Various uses possible	Mechanical lifespan exists

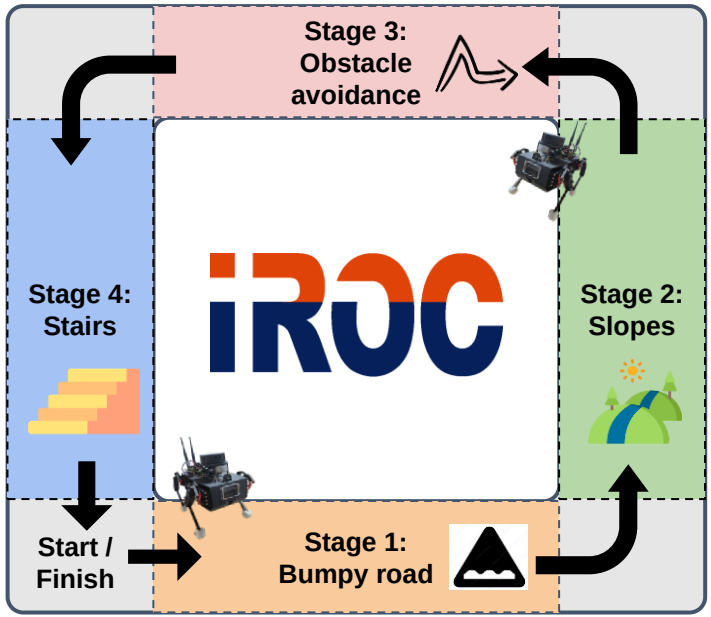
What to learn for AI Quadruped Robot?

Quadruped Robot: Specter-X

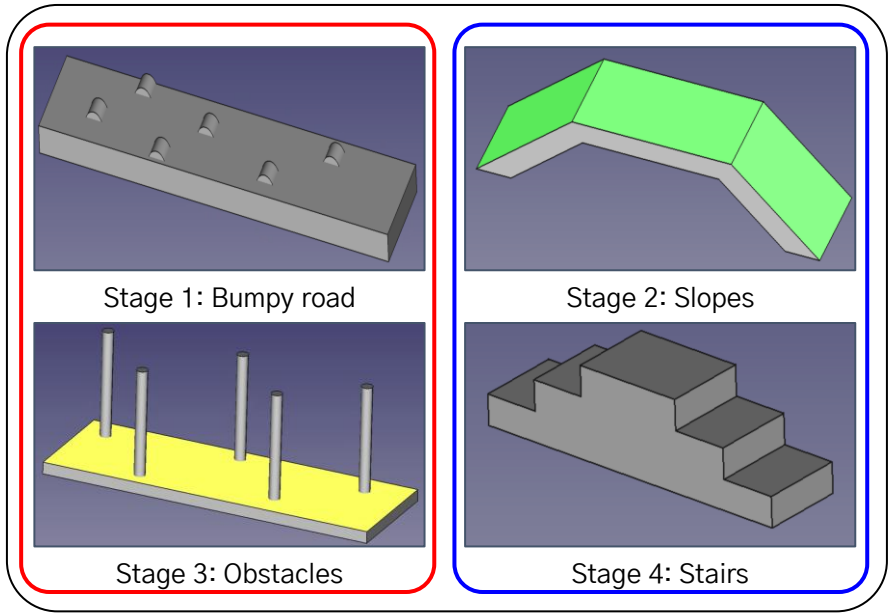


AI quadruped racing game

- Four stages to complete
- Each stage tests abilities such as stabilization and balancing, sensor management, obstacle avoidance, etc.
- The goal of the game is to reach the finish area as quickly as possible without losing its driving ability.



Course for AI Quadruped racing game



Planned for 3Q of 2024

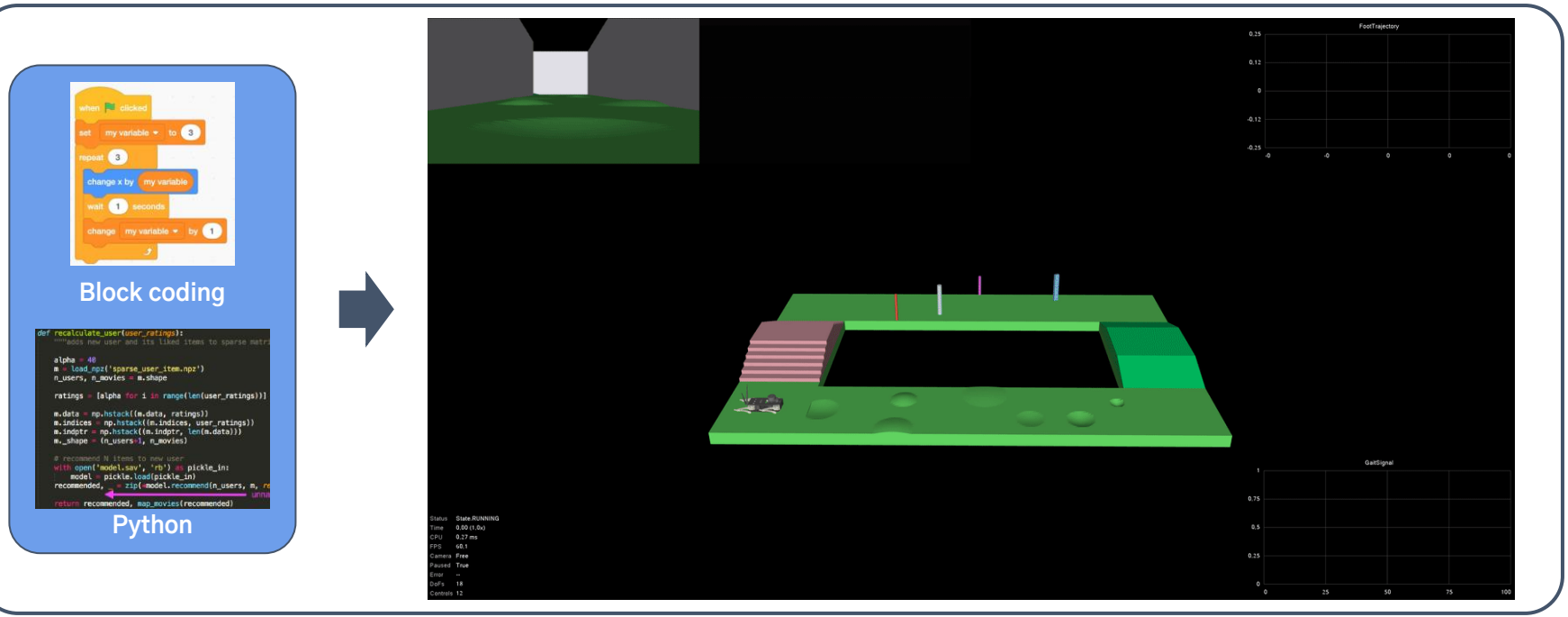
Course for each stage

Planned for 1Q of 2025

Simulator to Real world

Two phases in AI Quadruped Racing game

1. **Simulator:** A quadruped agent is trained for the racing game in the simulator.
2. **Real site:** Applying the trained agent (code), potentially after fine-tuning it, to a quadruped robot in preparation for a competition



1st phase: Simulator (Video)

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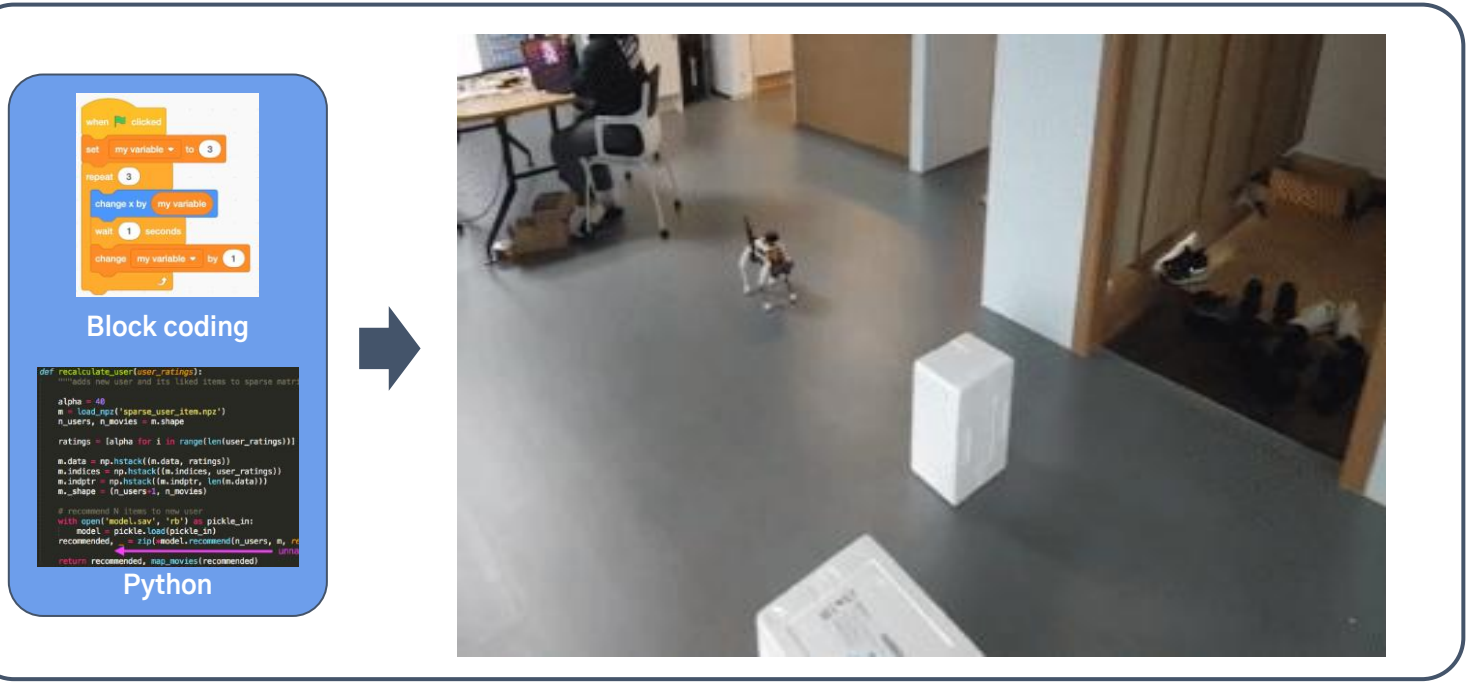

2nd phase: Real site (Video)

System Requirements

The local version of the AI Quadruped Racing game currently only supports **Ubuntu 22.04 OS:**

- **GPU** (Graphic card, nVIDIA) is required for **training the quadruped agent.**
- Minimum & Recommended requirements will be shared soon.

- **The Cloud/Web-based version** of the game will be released and announced through the IRO homepage.

- Seniors are required to have a basic understanding of programming, particularly in Python.
- Distribution of the simulator for juniors supporting block coding is planned.

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