

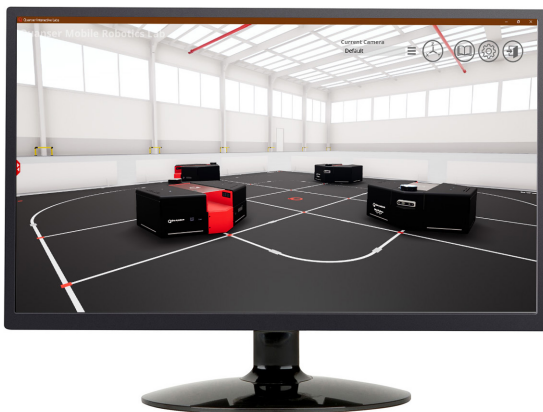
# QLABS VIRTUAL QBOT PLATFORM

## Virtual platform for distance and blended undergraduate mobile robotics courses

QLabs Virtual QBot Platform is a fully instrumented, dynamically accurate virtual twin of a QBot Platform. It behaves in the same way as physical hardware and can be measured and controlled using MATLAB®/Simulink® and Python™. QLabs Virtual QBot Platform can enrich your lectures and activities in traditional labs, or bring credible, authentic, industry-aligned, and academically oriented lab experiences into your distance and online mobile robotics course.

Same as the physical QBot Platform, the virtual system features a differential drive platform equipped with odometric, inertial, visual, and ranging sensors for robotic applications such as self-localization, path planning, state estimation, control, visual servoing, multiagent collaboration and more.

### Features



#### Academically appropriate

High-fidelity, credible lab experiences equivalent to use of physical lab equipment.



#### Comprehensive Resources

Industry-aligned curriculum mapped to popular mobile robotics courses.



#### Open access

Full access to system through MATLAB®/Simulink® and Python™



#### Scalable

12-month, multi-seat subscription

### Suitable Exploration Pathways

- Position & Velocity Kinematics
- Dead Reckoning & odometric localization
- Path Planning & Obstacle Avoidance
- 2D mapping & self-localization
- Image Acquisition, processing & reasoning
- Multiagent control & industrial automation
- Vision guided vehicle control
- Cobotics

### Teaching Topics

#### Released

- Forward/Inverse Differential Kinematics
- Image/Lidar Acquisition & Calibration
- Image Processing & Line Following
- Lidar Processing & Obstacle Detection

#### Future Plan

- Self-localization & State Estimation
- Path Planning & Navigation
- Task Queue Generation & Execution
- Multiagent Task Distribution and Collaboration

QLabs Virtual QBot Platform runs on Windows 10 (64-bit) and requires MATLAB/Simulink R2021a or later (not included), or Python 3.10+

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