

A Quanser Take on Intelligent Automation

Driven by rising operational costs, increasing data volumes, higher customer expectations, safety, and sustainability requirements, the modern industrial scene is pivoting towards automation that traditional human-operated and/or rule-based systems cannot efficiently manage. Intelligent automation is the combination of automation technologies and artificial intelligence to enable systems not only to execute tasks automatically, but also to perceive, reason, learn, adapt and make decisions in changing environments. This creates workflows that are data-driven, adaptive, dynamic, and can handle uncertainty.

Quanser's ecosystem of autonomous agents provide a complete platform for developing, testing, and deploying intelligent automation solutions by combining AI, perception, decision-making, digital-twins, and real-time control in safe and scalable environments. Quanser's agents enable you to integrate these technologies to optimize and execute tasks in both digital and physical environments with minimal human intervention.

Real-world testing poses critical challenges as it can be expensive, risky and time-consuming. These systems provide a controlled environment where users can experiment safely, fail safely, iterate quickly and validate algorithms before deployment, which significantly reduces development risk. Augmented with Quanser's digital twin collection via Quanser Interactive labs, you can rapidly innovate and build algorithms in simulation, test with the digital twins, and validate performance on hardware, providing an academically cohesive workflow.

With multi-language support and integration with NVIDIA Isaac[®], ROS 2[™], Python[®], C++, digital twins (via Quanser Interactive Labs), as well as MATLAB[®] and Simulink[®] (via QUARC[®]), you have all the software assets, APIs and research examples to get started with your exploration of intelligent automation. You gain access to a global academic network to collaborate with, made possible with our hardware solutions integrated in hundreds of universities, research laboratories and government-funded projects, and over 4000 research publications utilizing our systems.

Academic Objectives

- Kickstart, integrate, accelerate & sustain research workflows related to intelligent automation
- Explore foundational intelligent automation technologies - simulations, digital twins, applied AI & more
- Plan, implement and execute industry relevant applications - material handling, multiagent coordination, etc.
- Create motivational contexts for intelligent systems for research, teaching, projects & outreach

Intelligent Automation Lab

The Intelligent Automation Lab is a reconfigurable collection of intelligent agents including fixed and mobile robots that can be used to illustrate and address challenges encountered in industrial multi-agent applications such as material handling, multiagent systems, etc. This lab serves as an exciting and motivational context for the application of intelligent systems that can be leveraged for research, teaching, projects, and outreach.

Mobile Robotics Lab

This research and teaching lab offers a turn-key solution for institutions looking to build or upgrade their mobile robotics capacity, and serves as a foundational experience for traditional robotics, applied AI, physical AI and intelligent automation. It offers a comprehensive, ready-to-deploy ecosystem equipped with four QBot Platform mobile robots featuring advanced sensors and an integrated NVIDIA GPUs. Complete with ready-to-use courseware and research examples, the lab stands as a full package to cultivate industry-relevant skills and encourage multidisciplinary teamwork.

Introduction to Robotics Teaching Lab

This lab empowers educators to provide turn-key and foundational experiences for intelligent automation. It consists of hardware, software, digital twins, full student lab material as well as instructor resources to get you started. Equipped with six QArm Mini manipulators, each with four degrees of freedom and an RGB camera, the lab comes with ready-to-deploy curriculum for teaching key manipulation concepts including but not limited to position and velocity kinematics, as well as object recognition and visual servoing, arming your students with fundamental concepts and ready to explore intelligent automation technologies.

Physical AI Lab



Mobile Robotics Lab



Intro to Robotics Teaching Lab



QArm Research



QBot Platform



Quanser Conveyor

