

Research Guide

Content Guide

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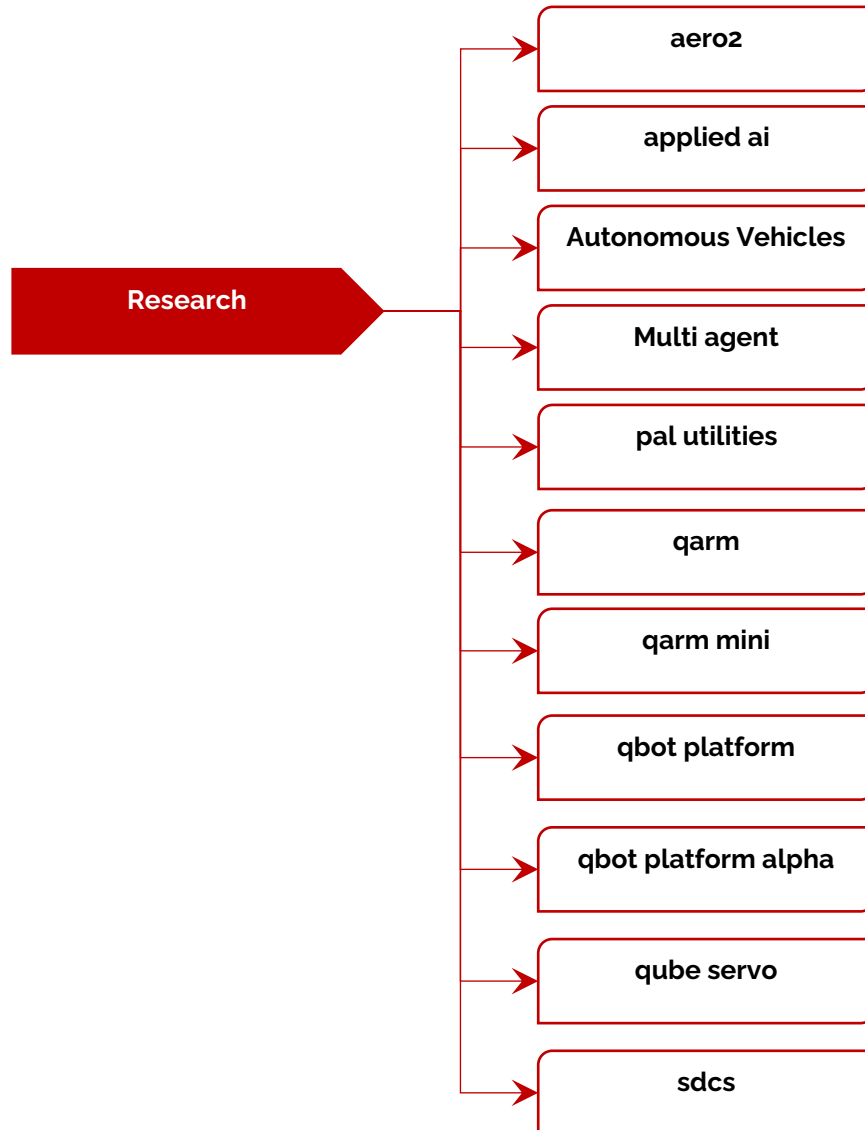


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Background

Welcome to the Quanser research resources! In this document we will focus on the wide variety of research examples provided by Quanser. A visual representation of the content available:



Note that the **Autonomous Vehicles** folder has examples for QDrone, QDrone 2, QBot 2, QBot 2e, QBot 3. The **SDCS** folder has examples for QCar, QCar 2 and the Traffic Light.

Getting started

1. If your institution has a Quanser lab please review **1-setup** before getting started.
2. For quick device level tests and getting started please review **2-quick start guides** to become familiar with the products you have available.

3. Before using Quanser's products, be sure to read the user manuals located in **3-user manuals**.
4. For examples, research applications and advanced use of Quanser products, please review the [research_content_guide.docx](#) under **5-research**.
5. For the teaching or student content provided by Quanser, please review [teaching_content_guide.docx](#) under **6-teaching** to view the available resources. These resources might suggest reviewing content under the **4-concept reviews** folder.

Before getting started with research examples please keep in mind research examples are composed in a variety of development environments. Use the following table to identify which development environments meet your research needs

	MATLAB/Simulink	Python	ROS
Aero2	✓	✓	x
Applied AI	x	✓	x
Autonomous Vehicles	✓	✓	x
Multi Agent	✓	✓	x
pal utilities	x	✓	x
QArm	✓	✓	✓
QArm Mini	x	✓	x
QBot Platform	✓	✓	✓
QBot Platform Alpha	✓	✓	x
Qube Servo	✓	✓	x
SDCS	✓	✓	✓

Considerations when getting started with research examples:

1. If the system at your institution has curriculum content available have you had an opportunity to go through it and understood the operating constraints of the system?

2. Does your knowledge of these development environments meet a minimum threshold? The following are considerations and questions to ask yourself before getting started.
 - a. For MATLAB/Simulink examples, do you know how to:
 - i. Get around a Simulink model, drop in blocks, set the step size for a model, specify the target device that code will compile for, where the code is actually running? See the [Simulink Onramp](#) for more help with getting started with Simulink.
 - ii. Checked out the list of available QUARC blocks to help you get started? If you haven't please take a look at the following link to get an understanding of the core functionalities that Quanser has put together https://docs.quanser.com/quarc/documentation/quarc_demos.html
 - b. For Python users do you know how to:
 - i. Import and call libraries inside a python script?
 - ii. Understand the basics of timing and how to enforce a specific time step during a python application?
 - iii. Understand whether or not the example is designed for the host computer or the actual Quanser device?

Ex: for devices like the QCar 2 you can run python examples locally on the QCar to read data and perform a task. This requires you to copy and run files on the system. Do you have an understanding of how to complete these steps?
 - c. For ROS users do you know how to:
 - i. Compile your ROS distro?
 - ii. Created a python/C++ ROS node in the past?
 - iii. Understand the differences between ROS 1 and ROS 2 distributions?
 - iv. Understand how workspaces, packages, nodes work and their folder structure?