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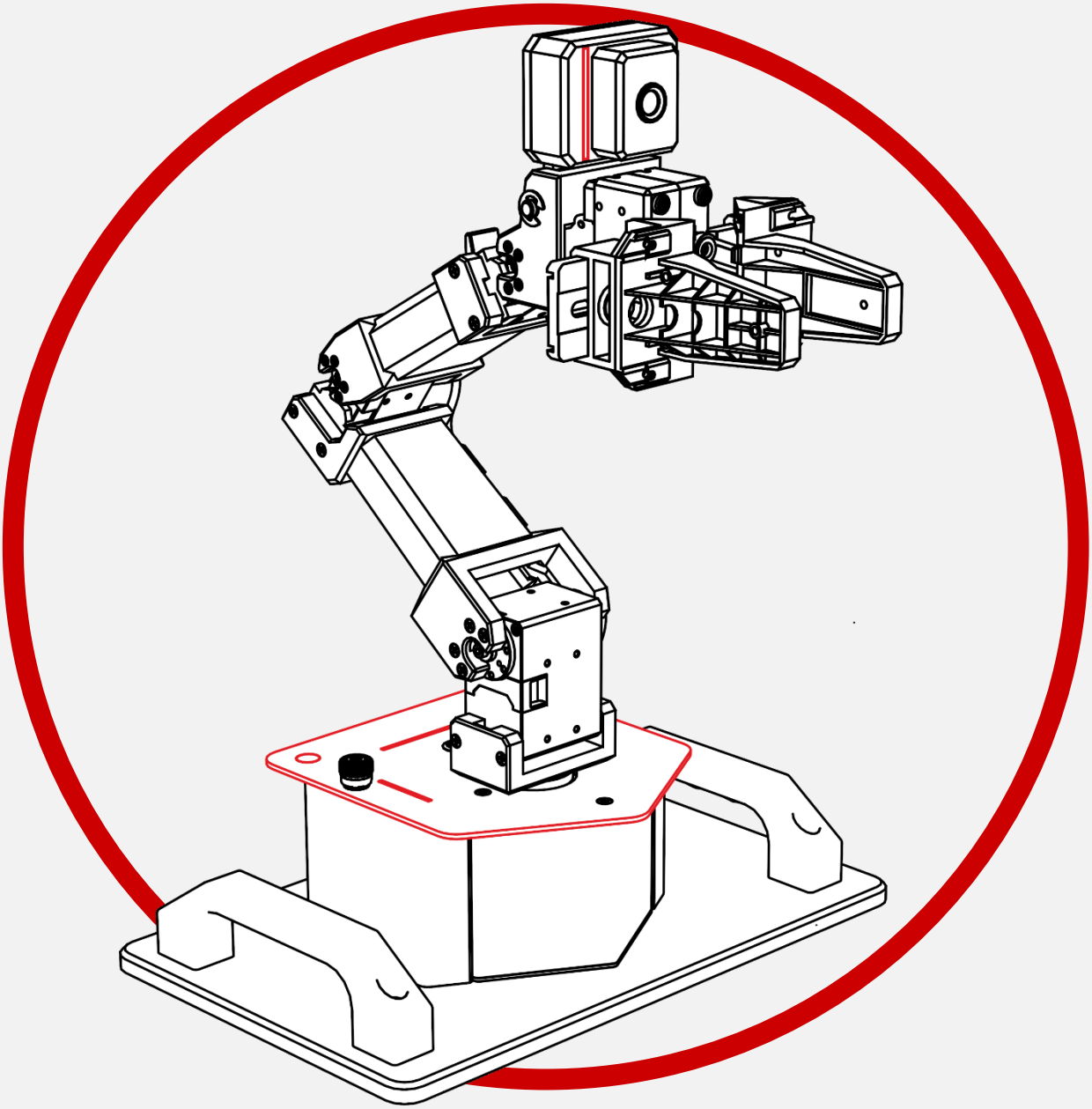

QArm Mini

Visual Servoing

V1 – 13th March 2025

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QArm Mini – Application Guide

Visual Servoing

What is Visual Servoing?

Visual servoing is a control method that uses image-based information to guide the movement of a robotic manipulator. Unlike predefined trajectories or joint-based tasks, visual servoing relies on real-time visual feedback to adjust the robot's position. Building on the image acquisition and object detection concepts from the previous lab, this lab focuses on developing a computer vision pipeline that enables the QArm Mini to detect and track a chosen color.

Background

Prior to starting this lab, please review the following concept reviews (located in Documents/Quanser/4_concept_reviews/),

- Concept Review – Perception → Color Spaces
- Concept Review – Perception → Image Filters
- Concept Review – Robotics → Differential Kinematics

Getting started

This lab integrates image processing with real-time motion control to guide the QArm Mini. This lab extends previous knowledge of image acquisition and object detection, using differential kinematics to convert visual feedback into accurate arm movements. Ensure you have completed the following labs

- Play Lab
- Lab 3: Vision

Before you begin this lab, ensure that the following criteria are met.

- If using a physical QArm Mini, make sure it is securely attached to the base and the manipulator is in the rest position. See the QArm Mini Quick Start Guide for details on this step.
- You are familiar with the basics of Simulink. See the Simulink Onramp for more help with getting started with Simulink.