

EduSCARA

An Open-source Industrial Robotics Education Platform

Introduction

The Educational Selective Compliance Assembly Robot Arm development platform is a cost-effective, scaled-down industrial robot supporting a wide range of applications:

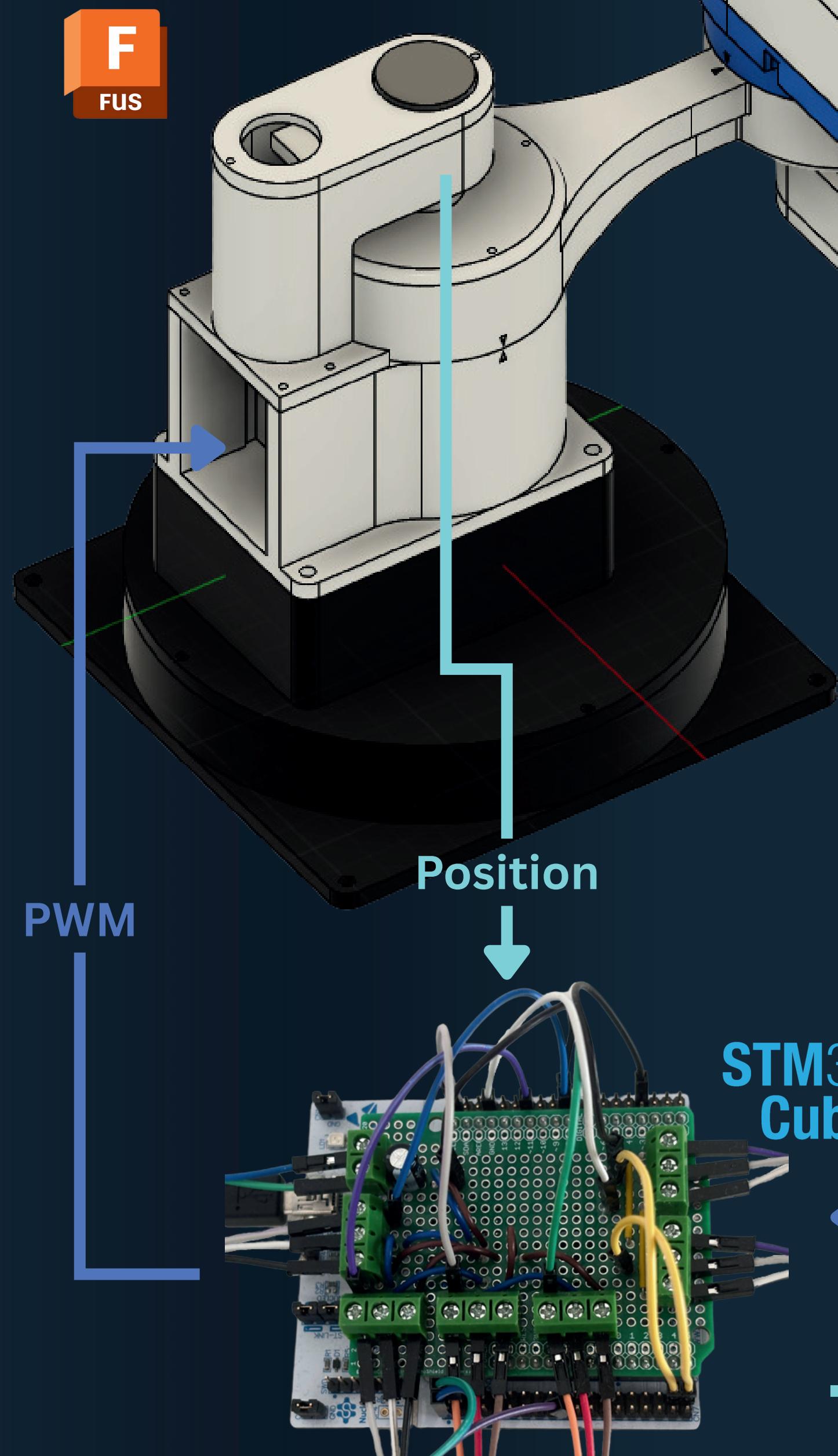
- Practical robotics education
- Research and prototyping
- Small-scale automation tasks

A hands-on development environment that serves as an accessible stepping stone, closely replicating the architecture and workflow of industrial systems. The platform includes:

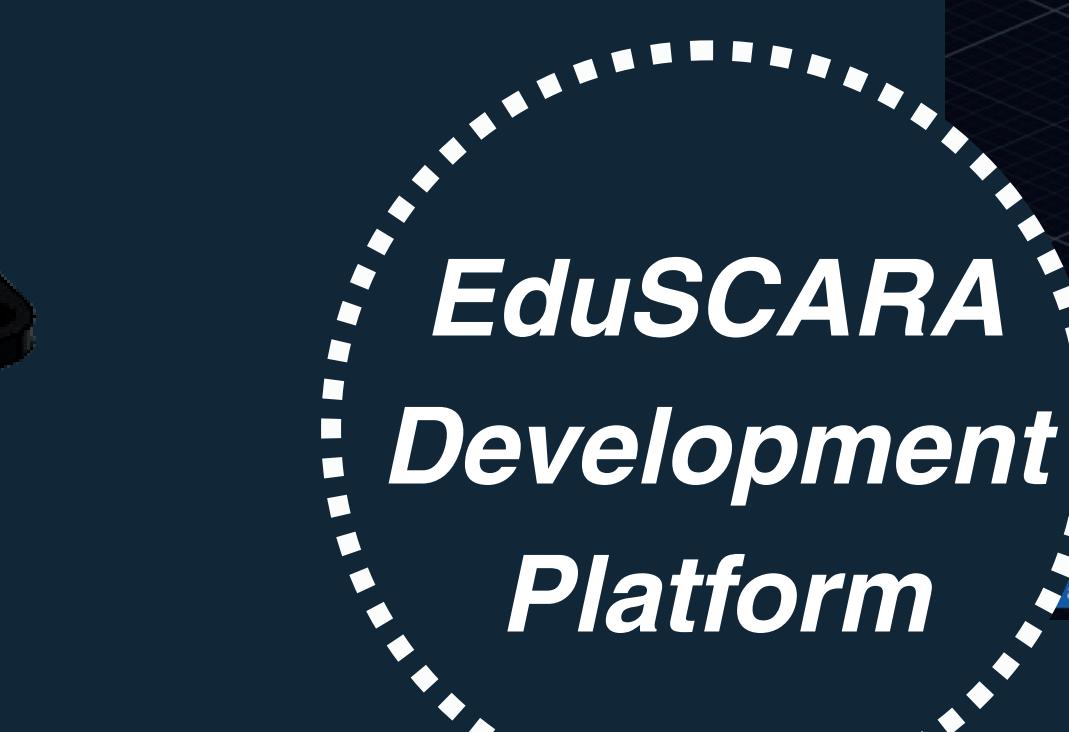
- Table-top sized 3D printable servo SCARA Manipulator
- SCARA Motion Controller with open-source firmware
- Python API for sending commands to Motion Controller
- Simulation environment with Motion Controller Emulator

Method

SCARA Manipulator



SCARA Motion Controller



STM32
CubelIDE

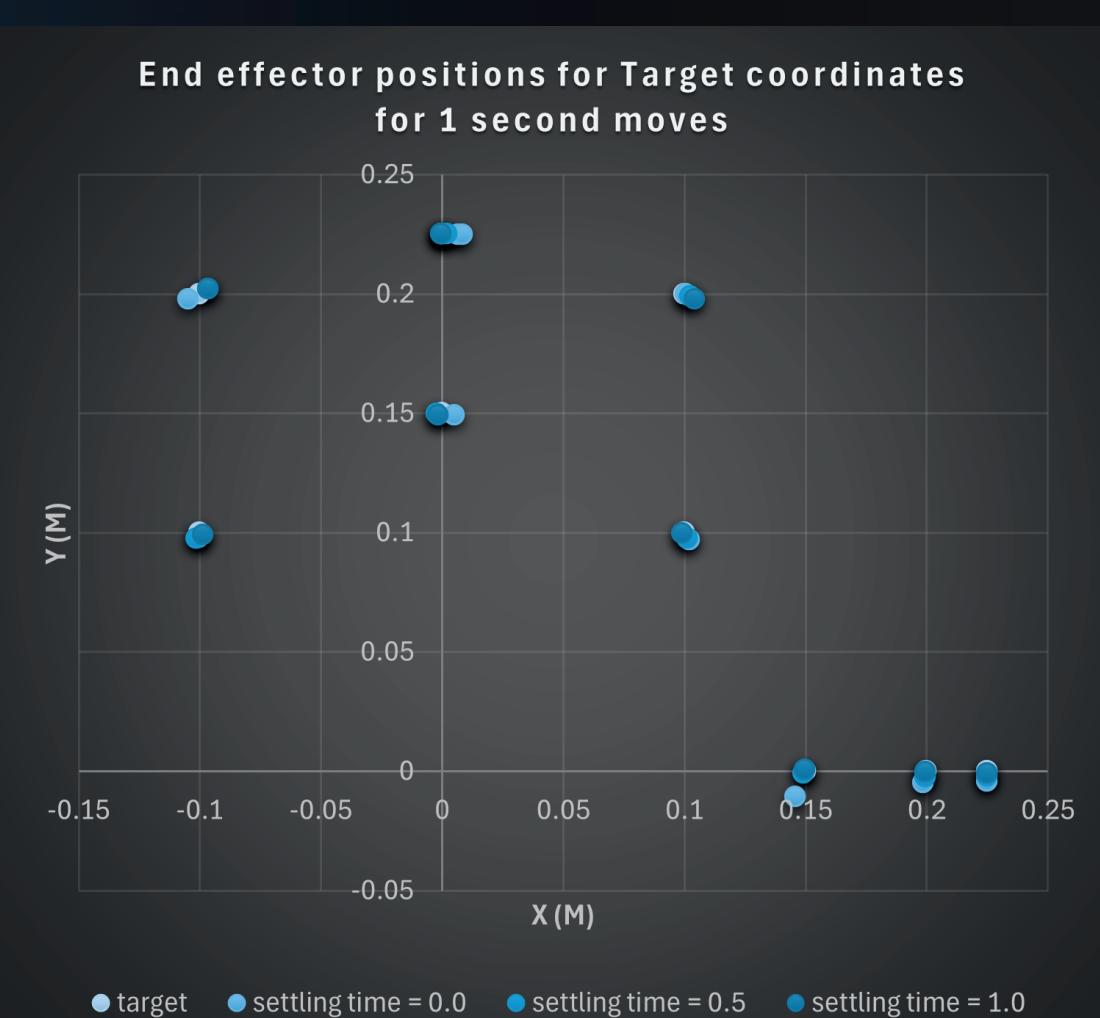
Command
Serial
Response



Python API

Results & Conclusions

The manipulator achieves joint accuracy within 2° and positional accuracy within 5 mm of the target. However, backlash remains a significant issue; replacing servo motors with stepper motors is expected to improve precision.



Example Application / Exercise: Resistor Sorter

This example exercise uses EduSCARA to test and sort resistors, providing students with hands-on experience in CAD, embedded programming, API development, simulation, and machine learning integration.

