Arduinobot

Introduction

Setup

Digital Twin

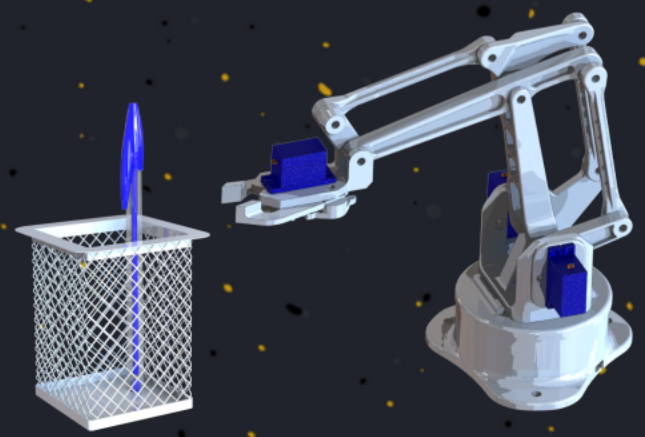
ROS 2

Control

Kinematics

Application

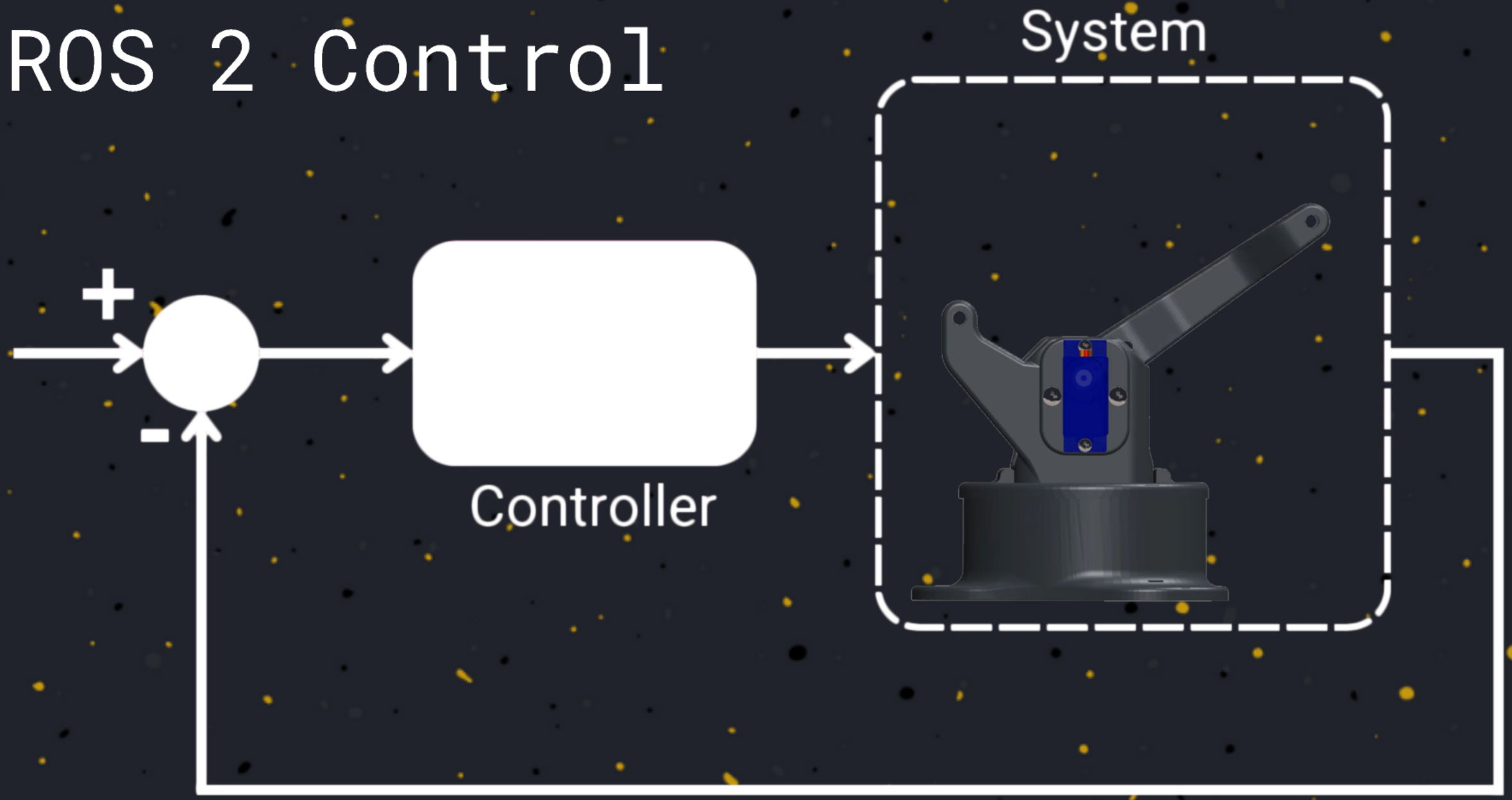
Alexa



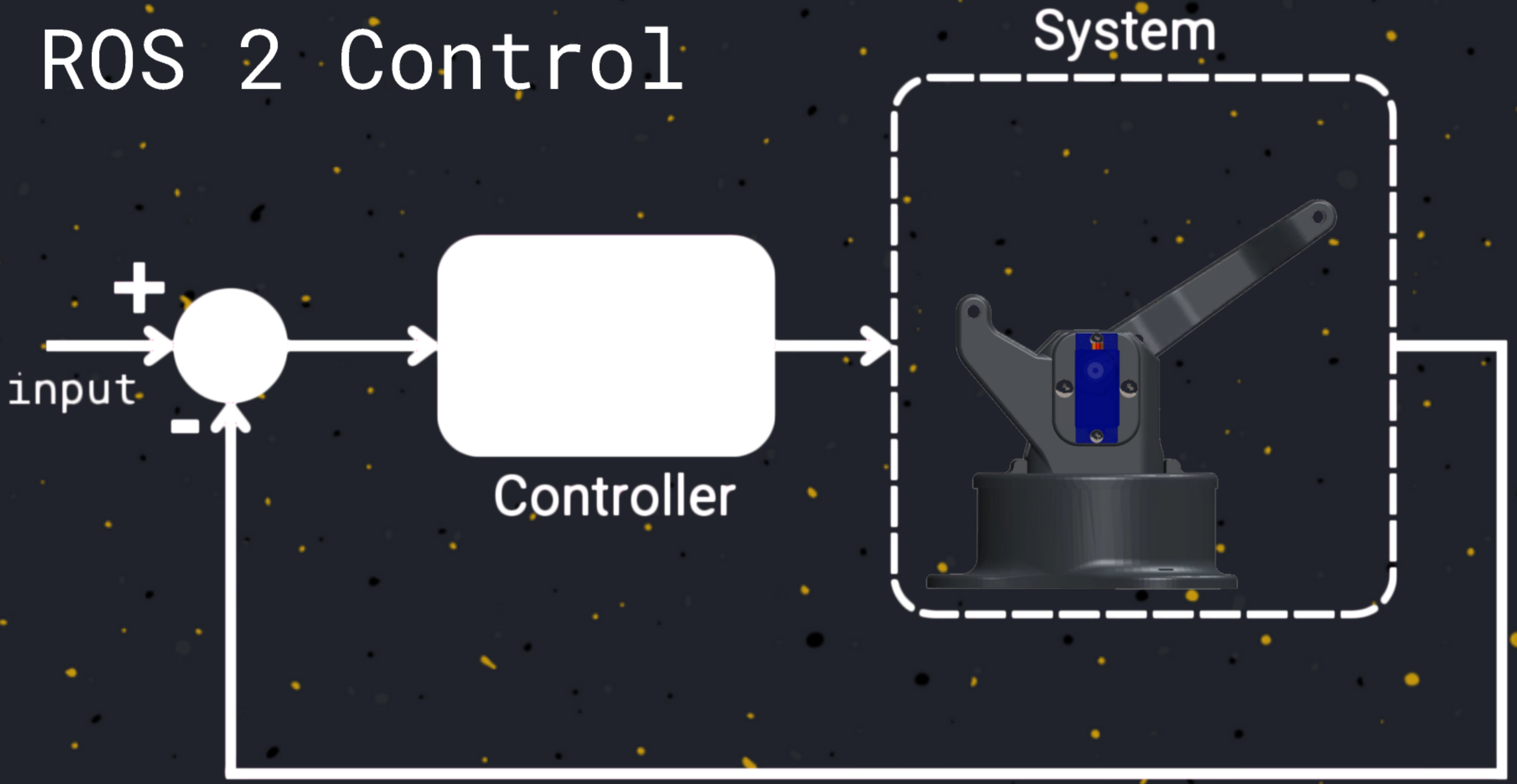
Conclusions

Build

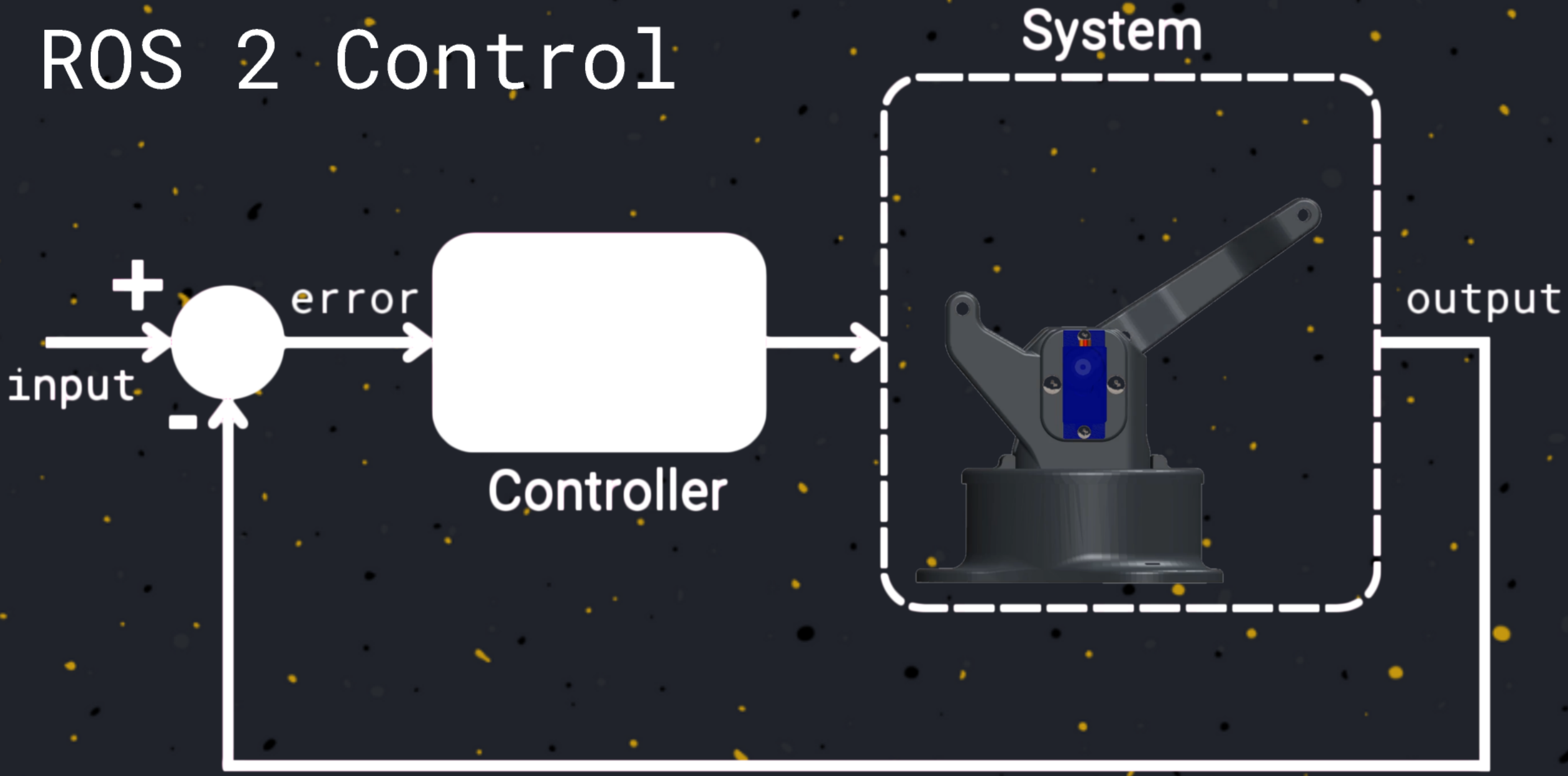
ROS 2 Control



ROS 2 Control



ROS 2 Control



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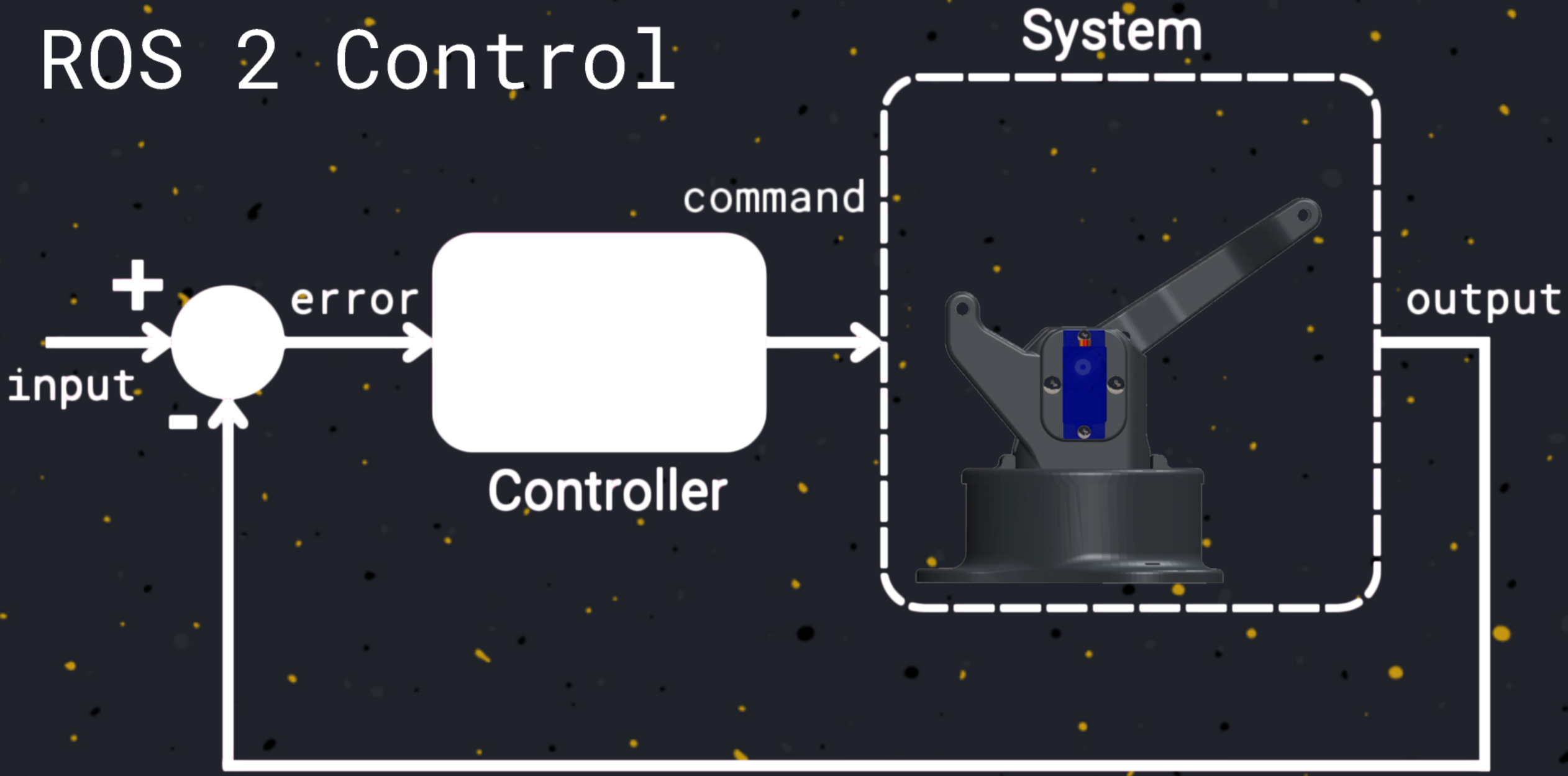
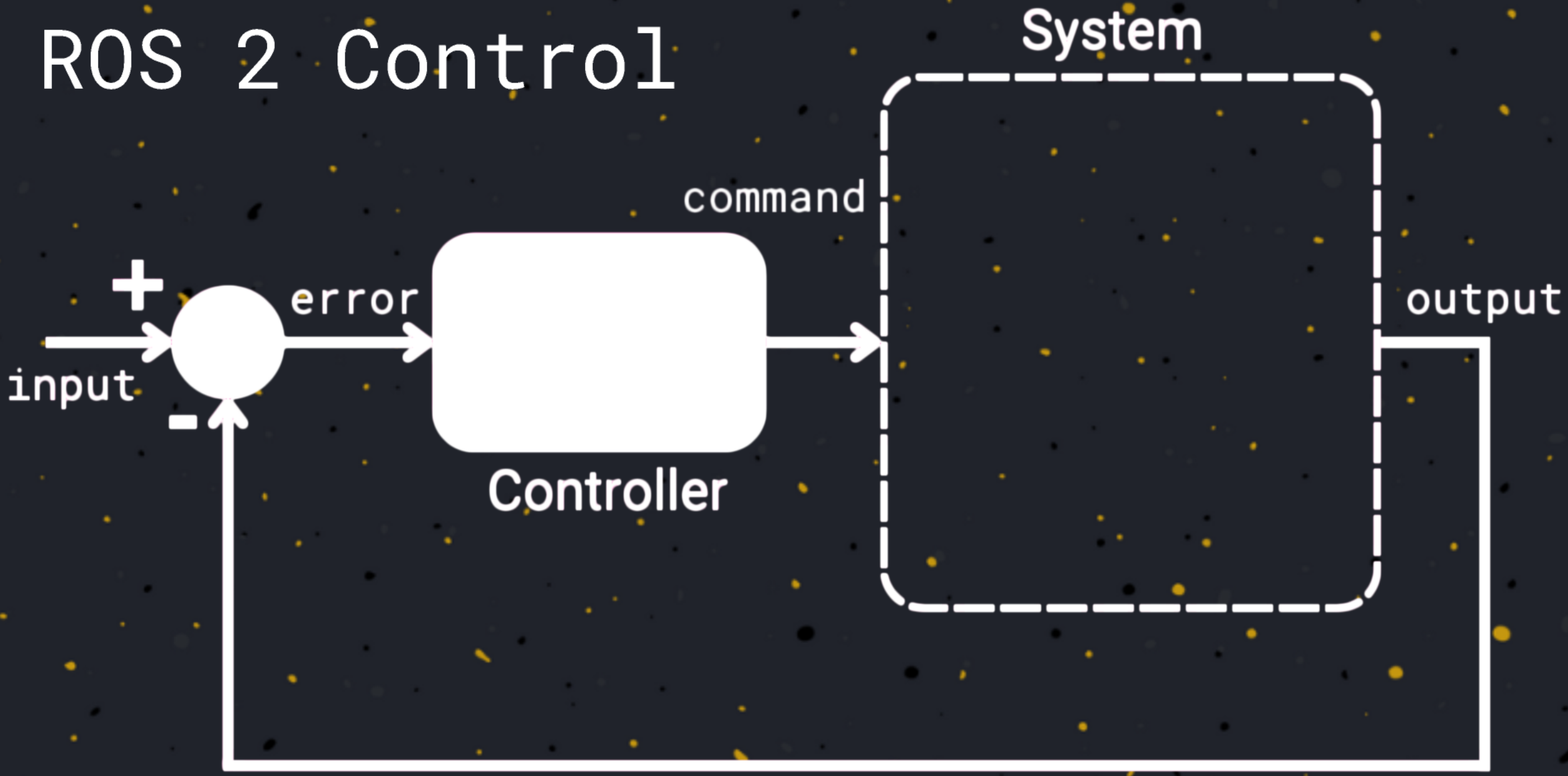
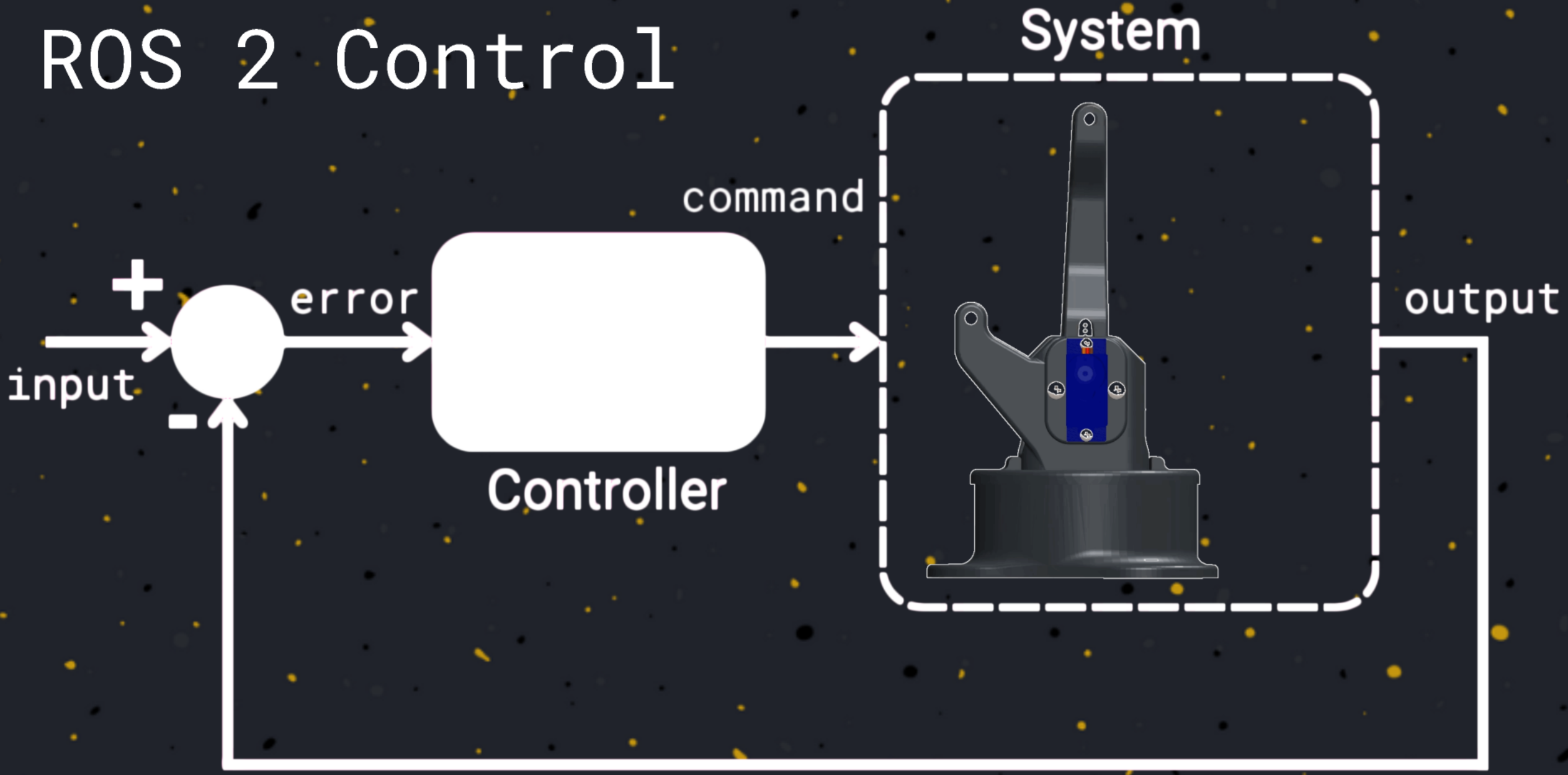


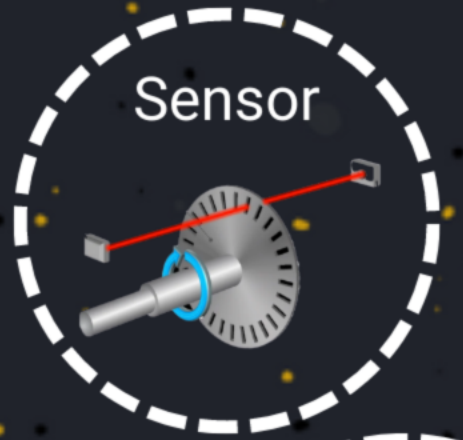
ROS 2 Control

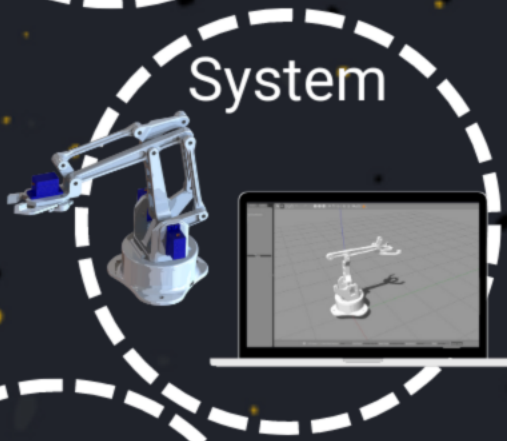


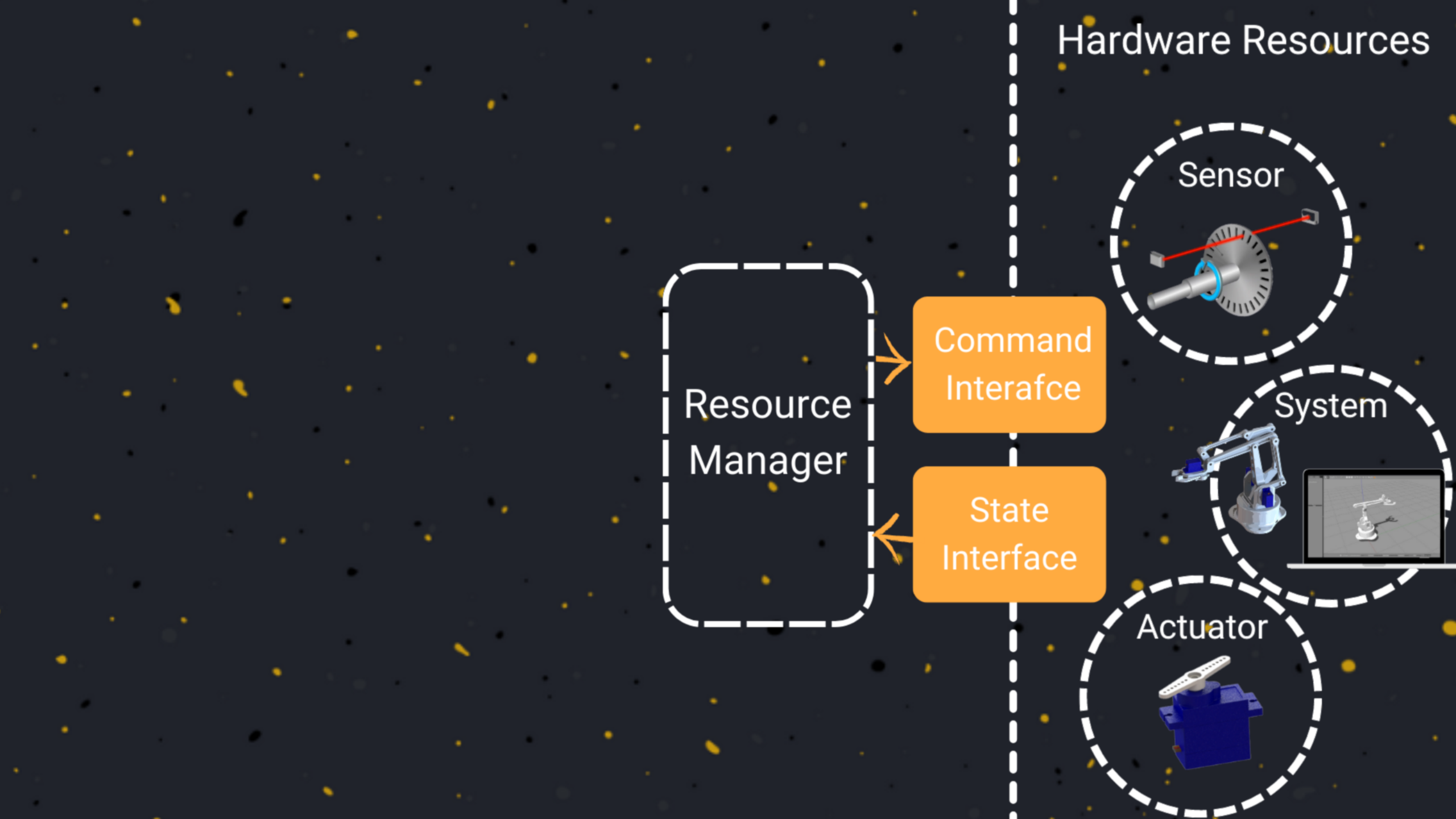
ROS 2 Control

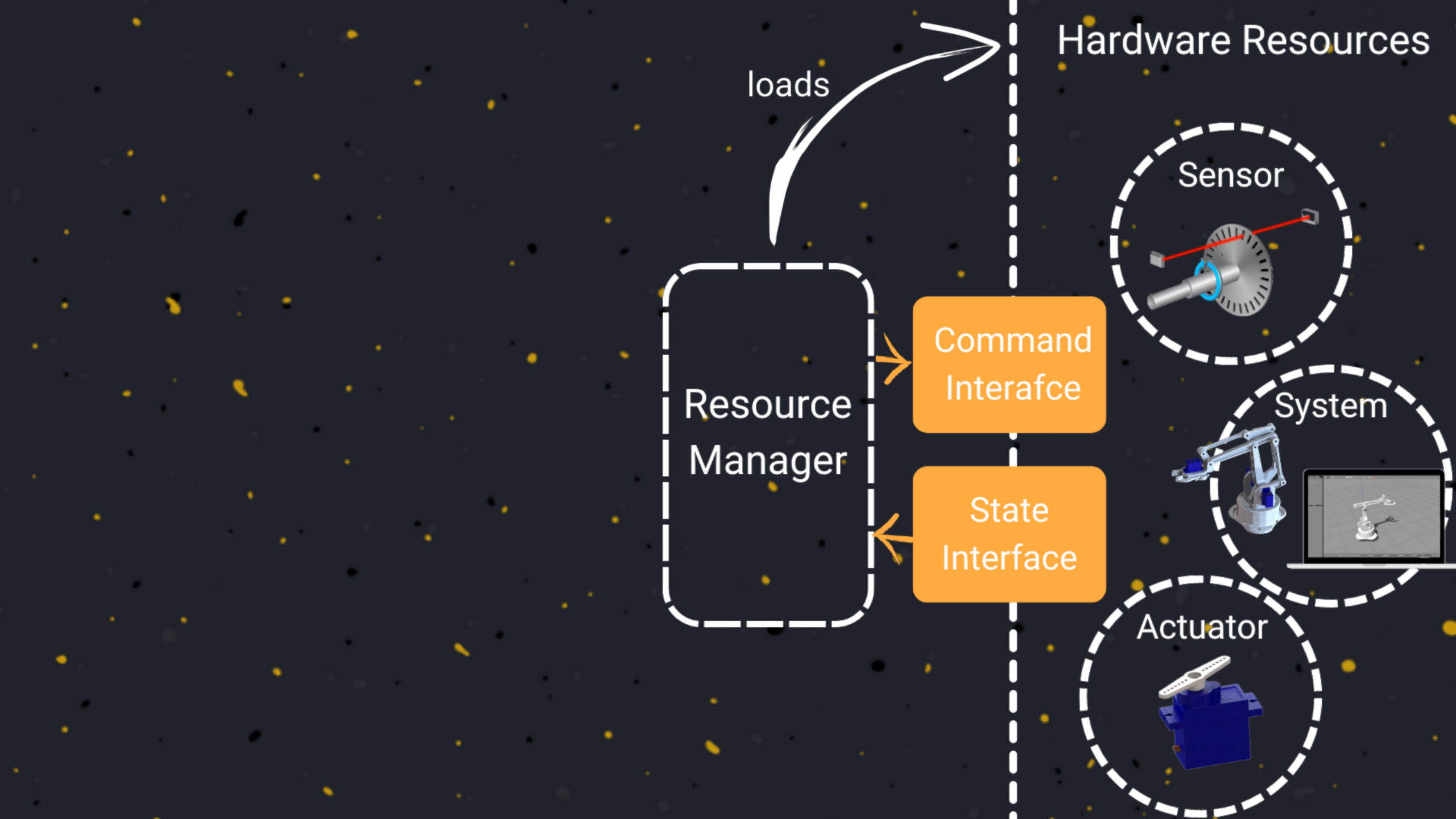


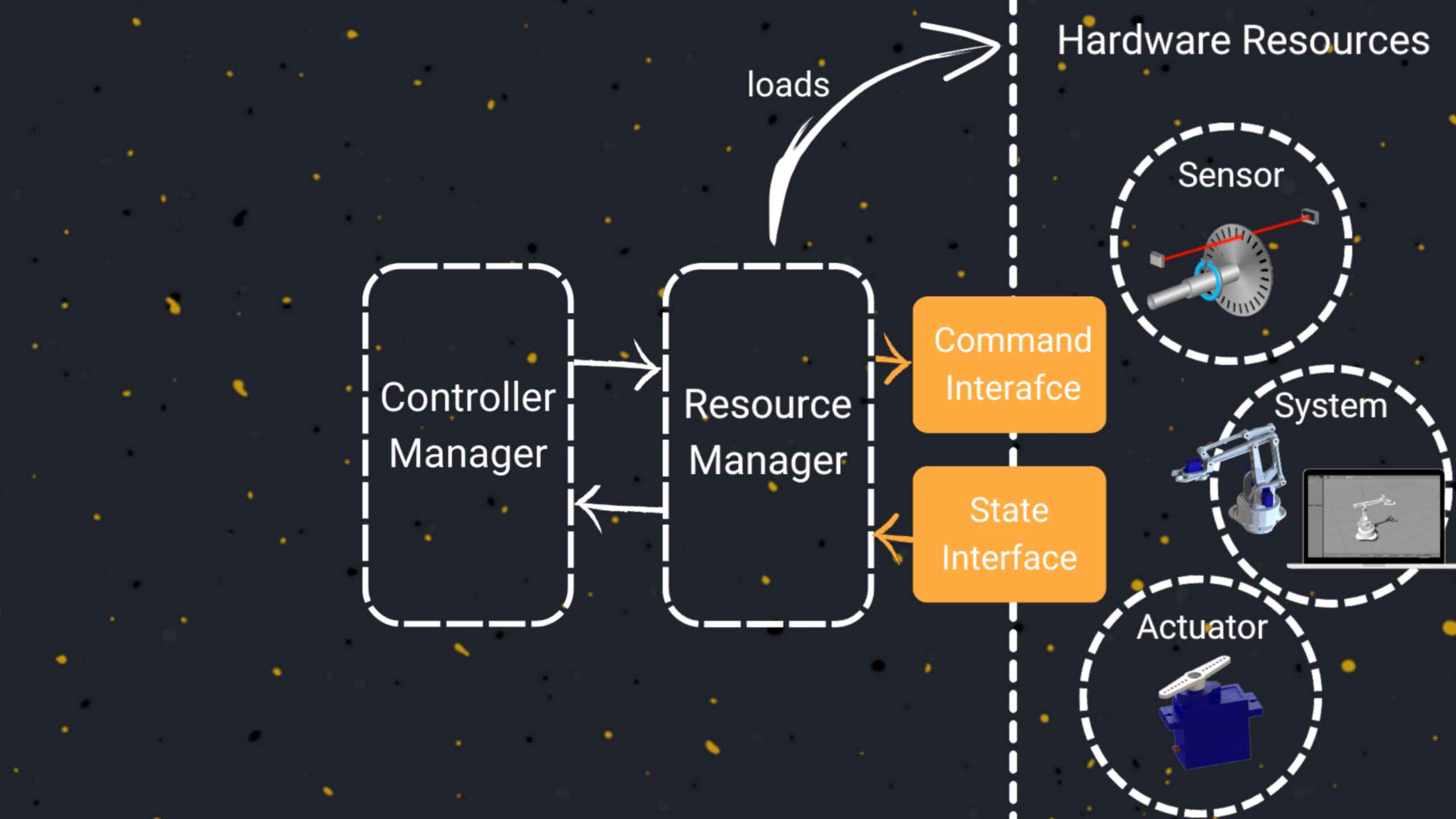
Hardware Resources






Hardware Resources
Sensor
Resource Manager
Command Interafce
State Interface
System
Actuator


Hardware Resources
loads
Resource Manager
Command Interafce
State Interface
Sensor
System
Actuator


Hardware Resources
loads
Controller Manager
Resource Manager
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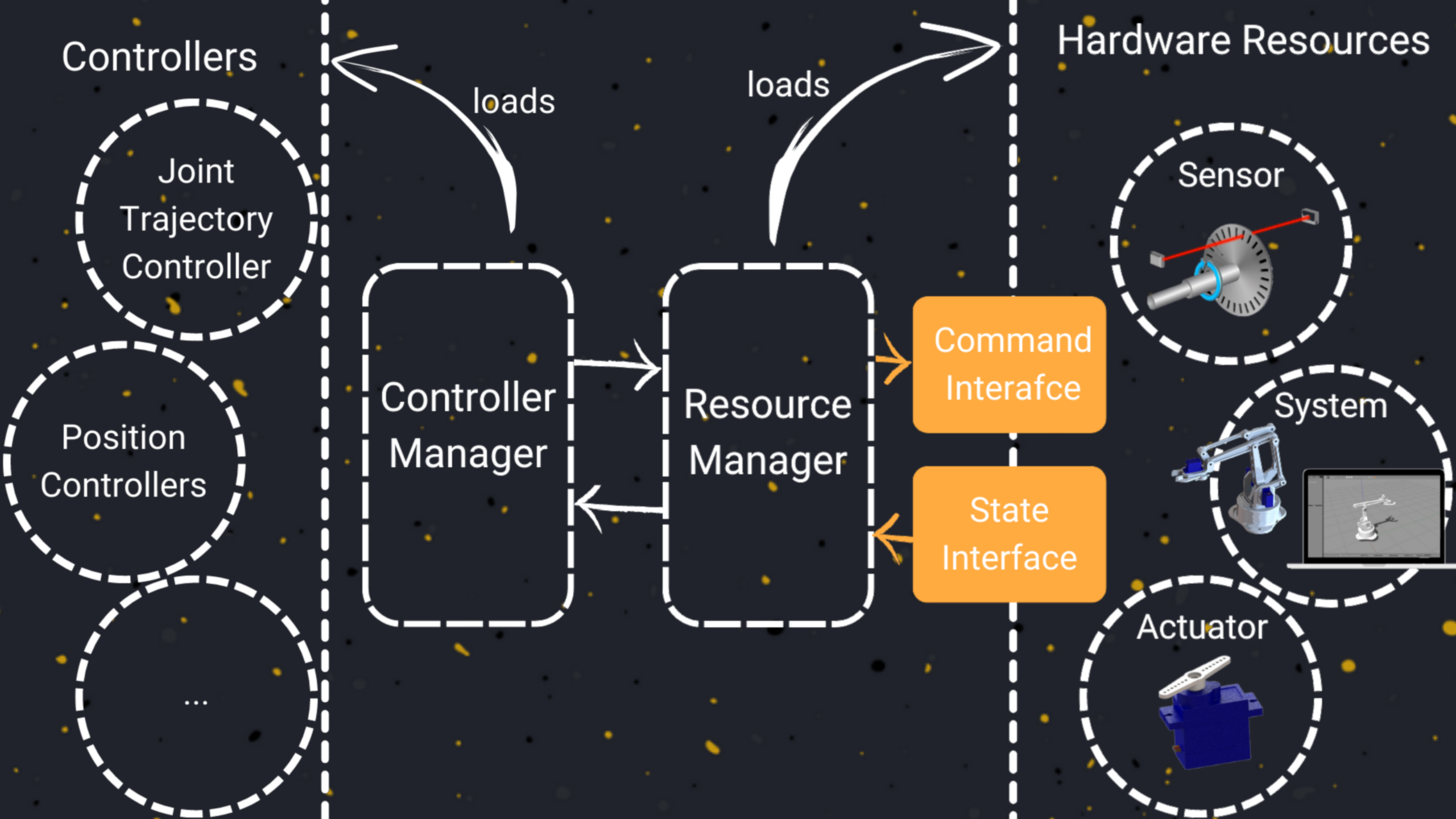
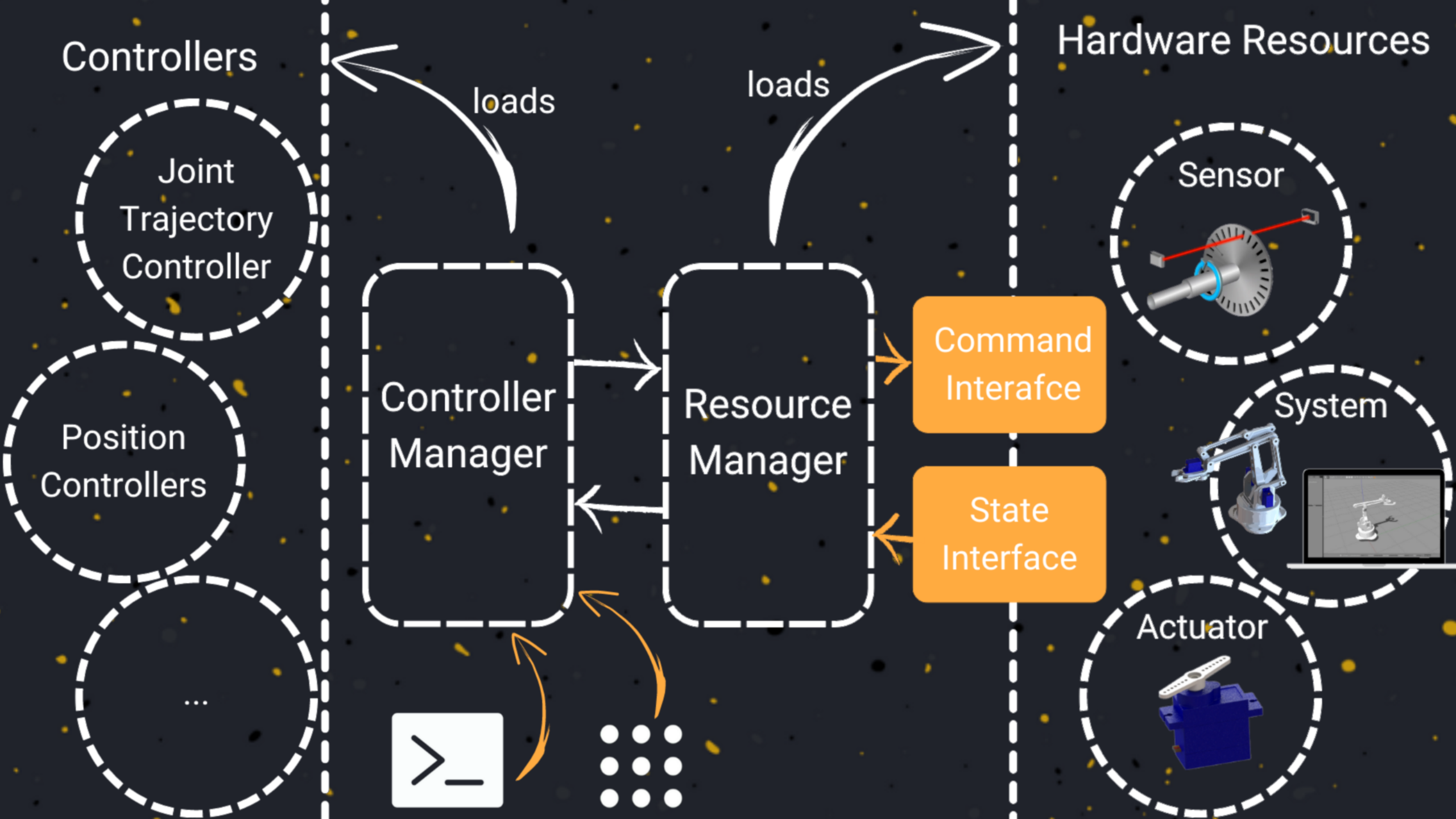
State Interface
Sensor
System
Actuator


Controllers
Joint Trajectory Controller
Position Controllers
...
loads
loads
Controller Manager
Resource Manager
Command Interafce
State Interface
Hardware Resources
Sensor
System
Actuator


Controllers
Joint Trajectory Controller
Position Controllers
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loads
loads
Controller Manager
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State Interface
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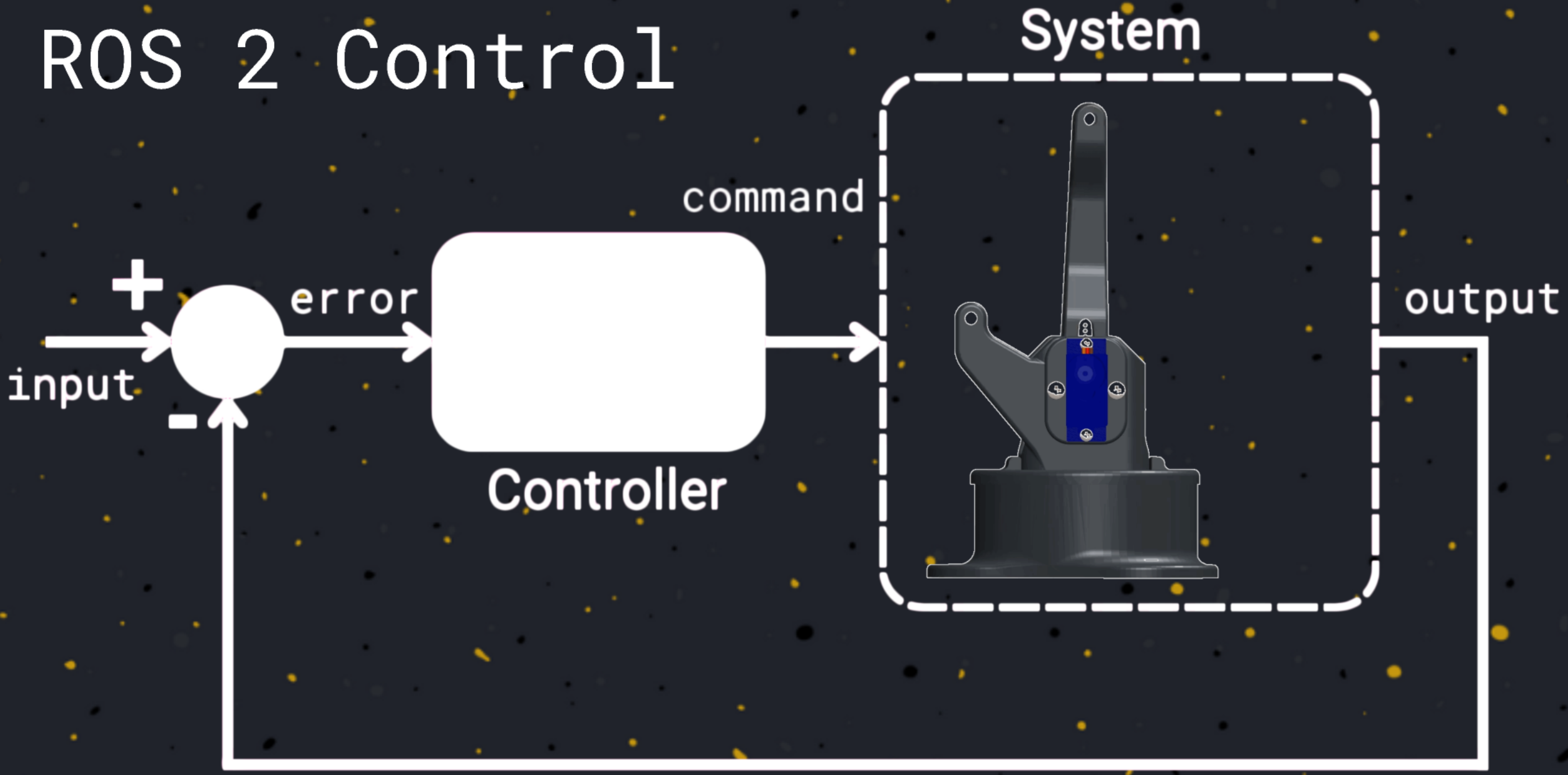
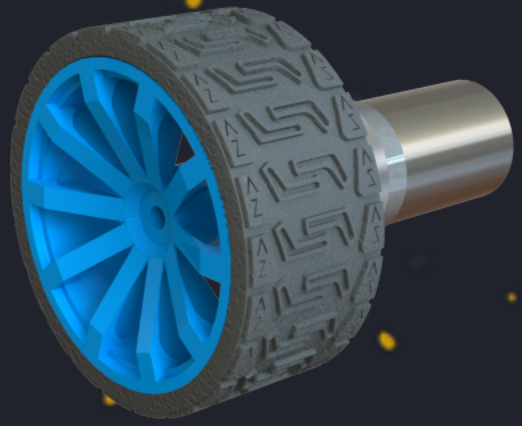
Sensor
System
Actuator

ROS 2 Control

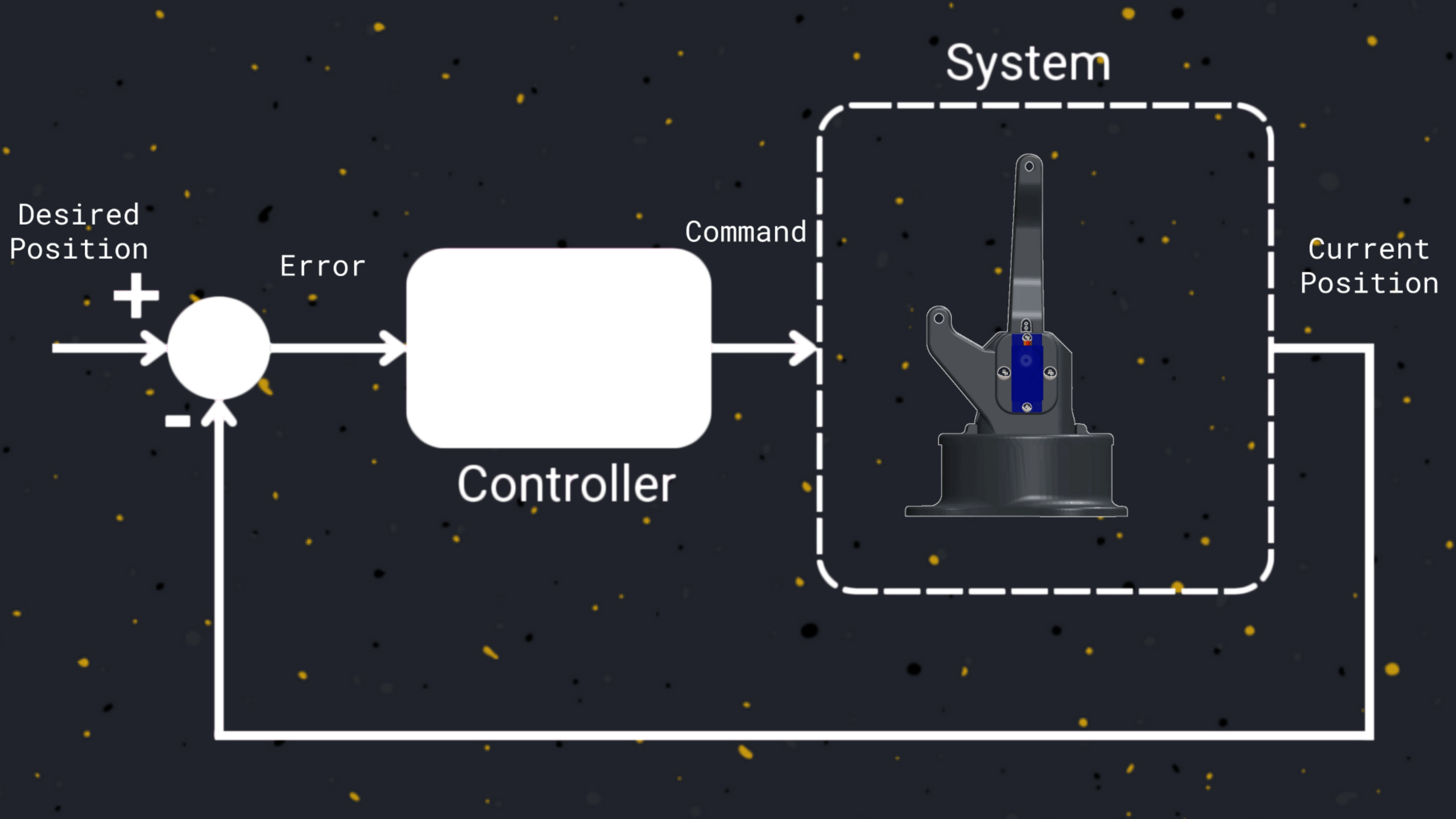


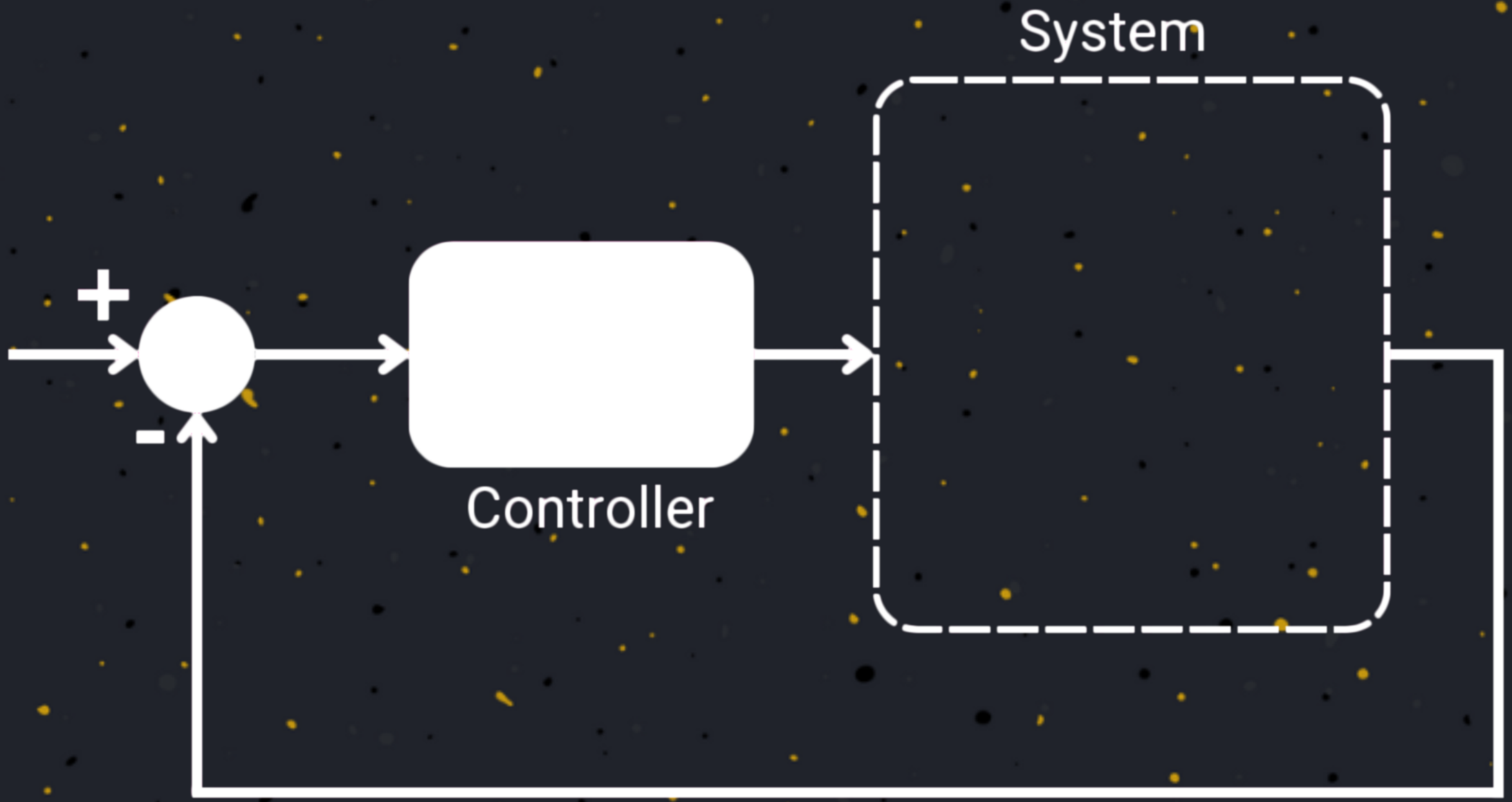
Position

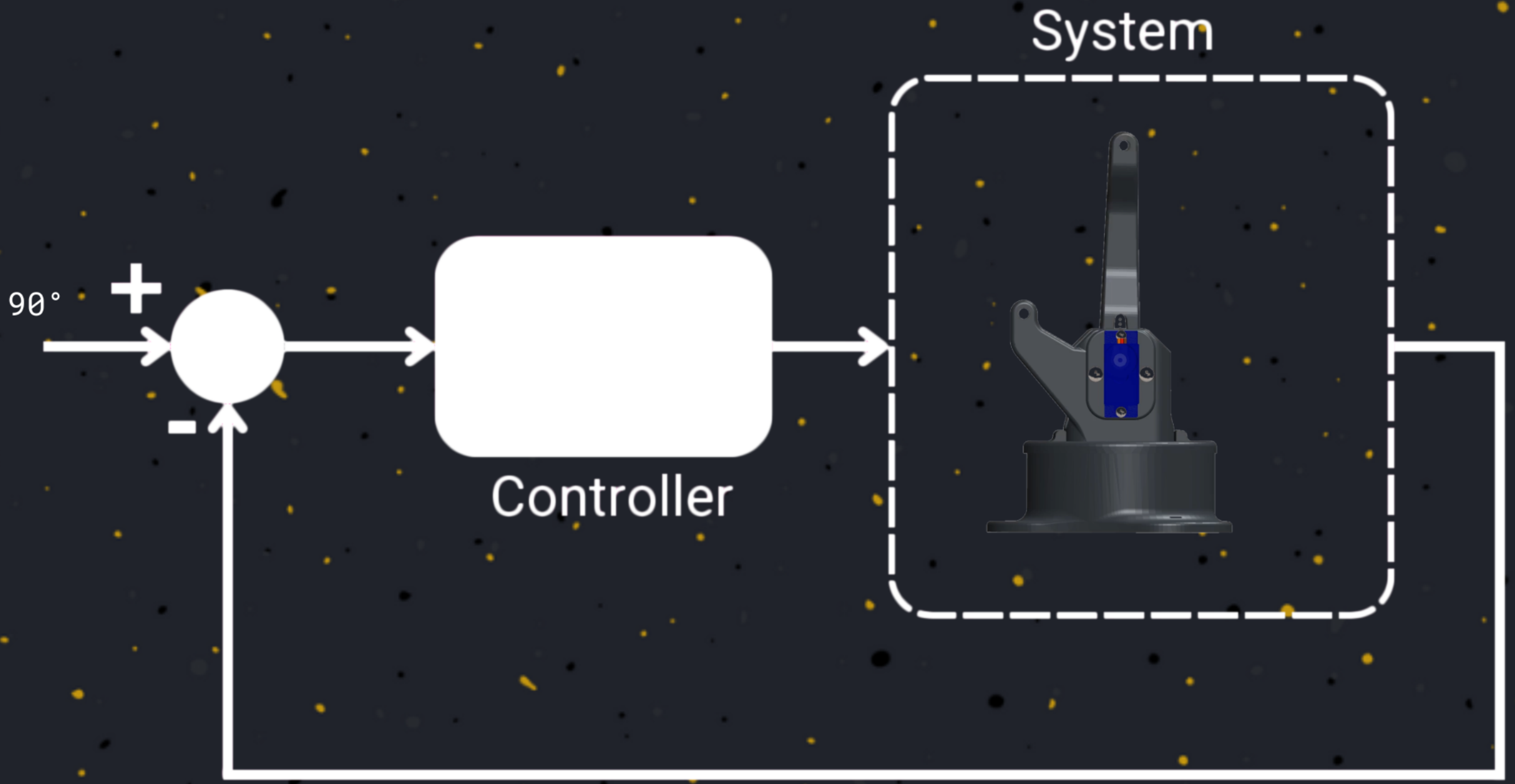


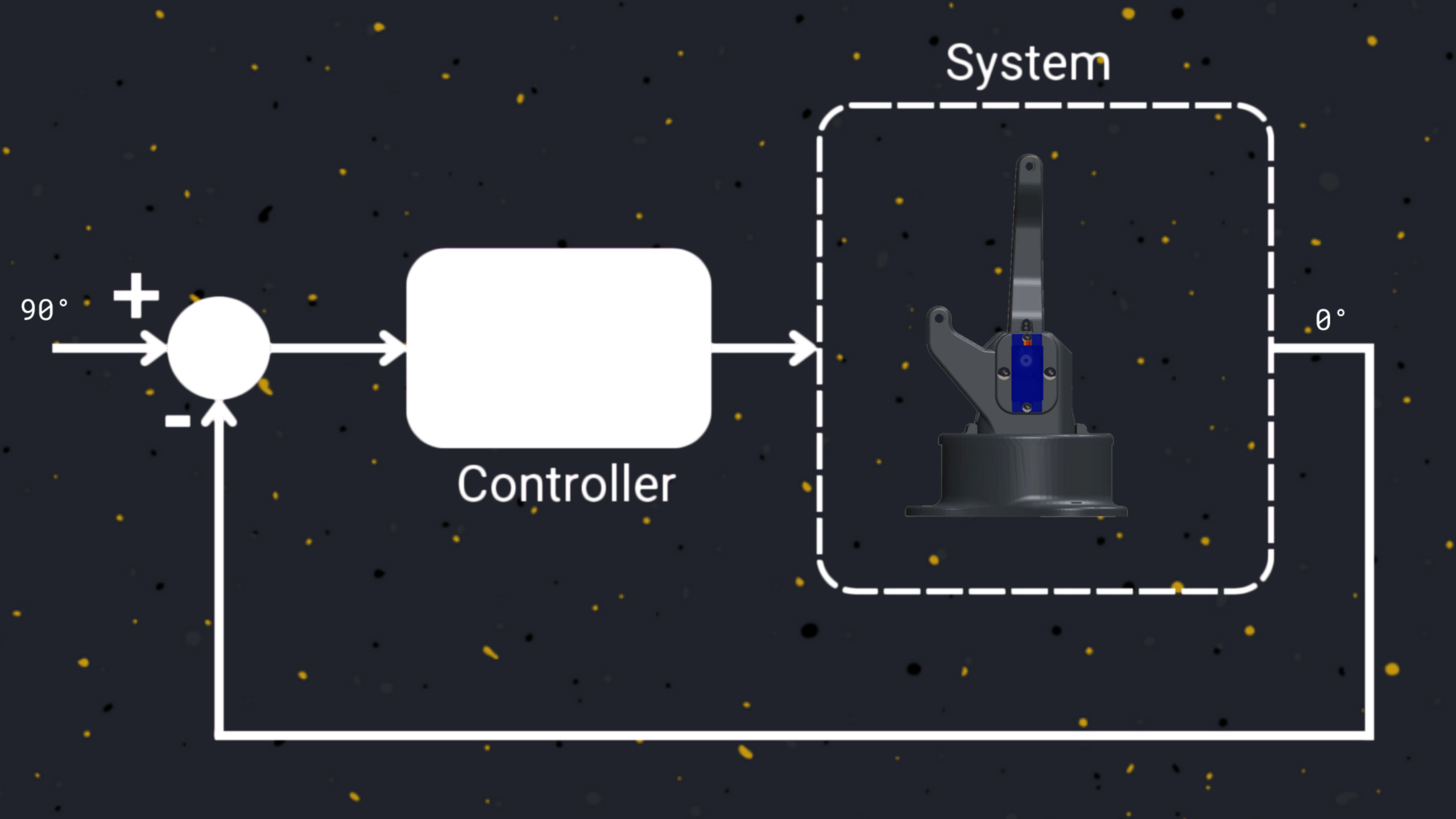
Velocity

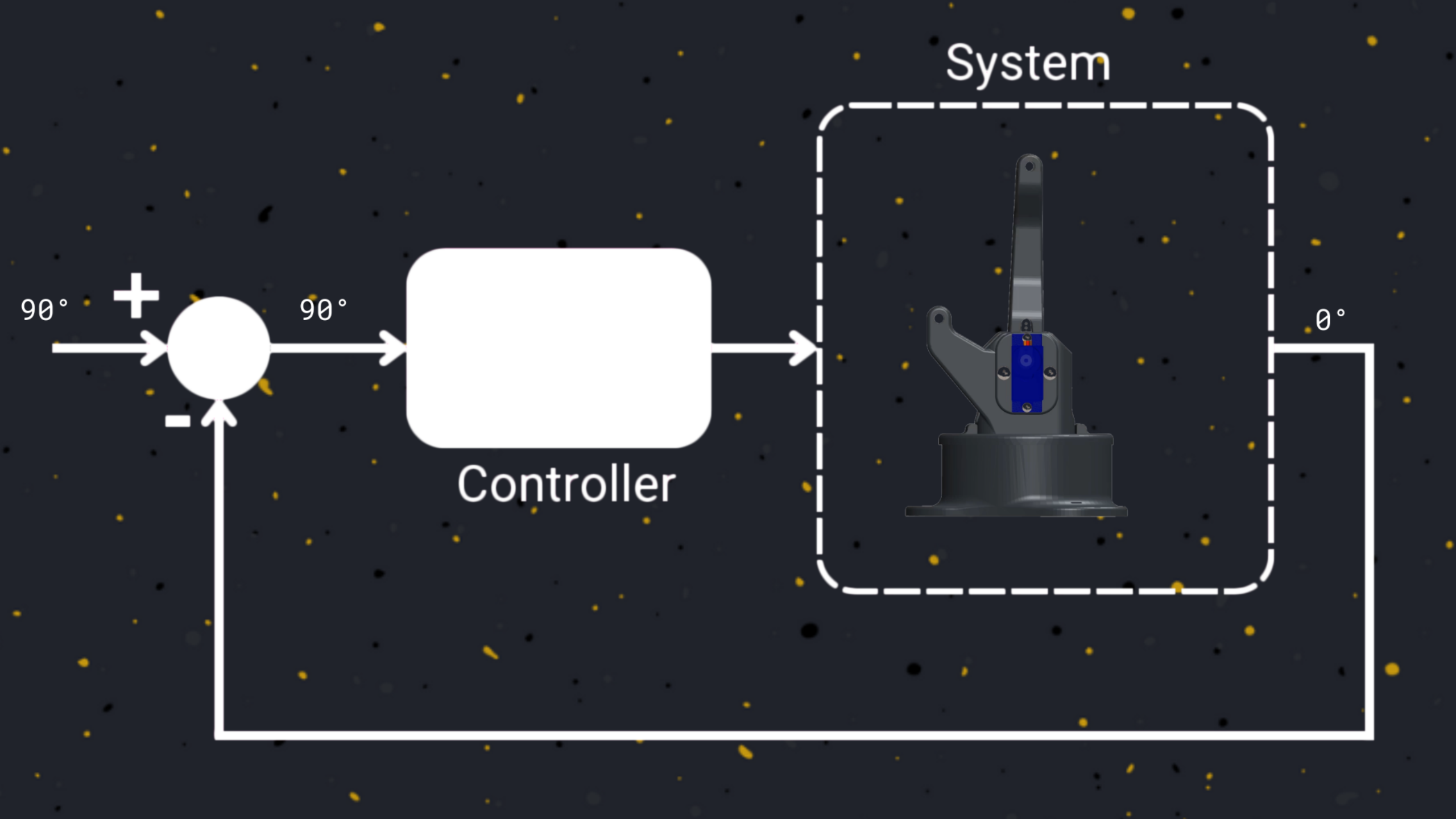
Effort

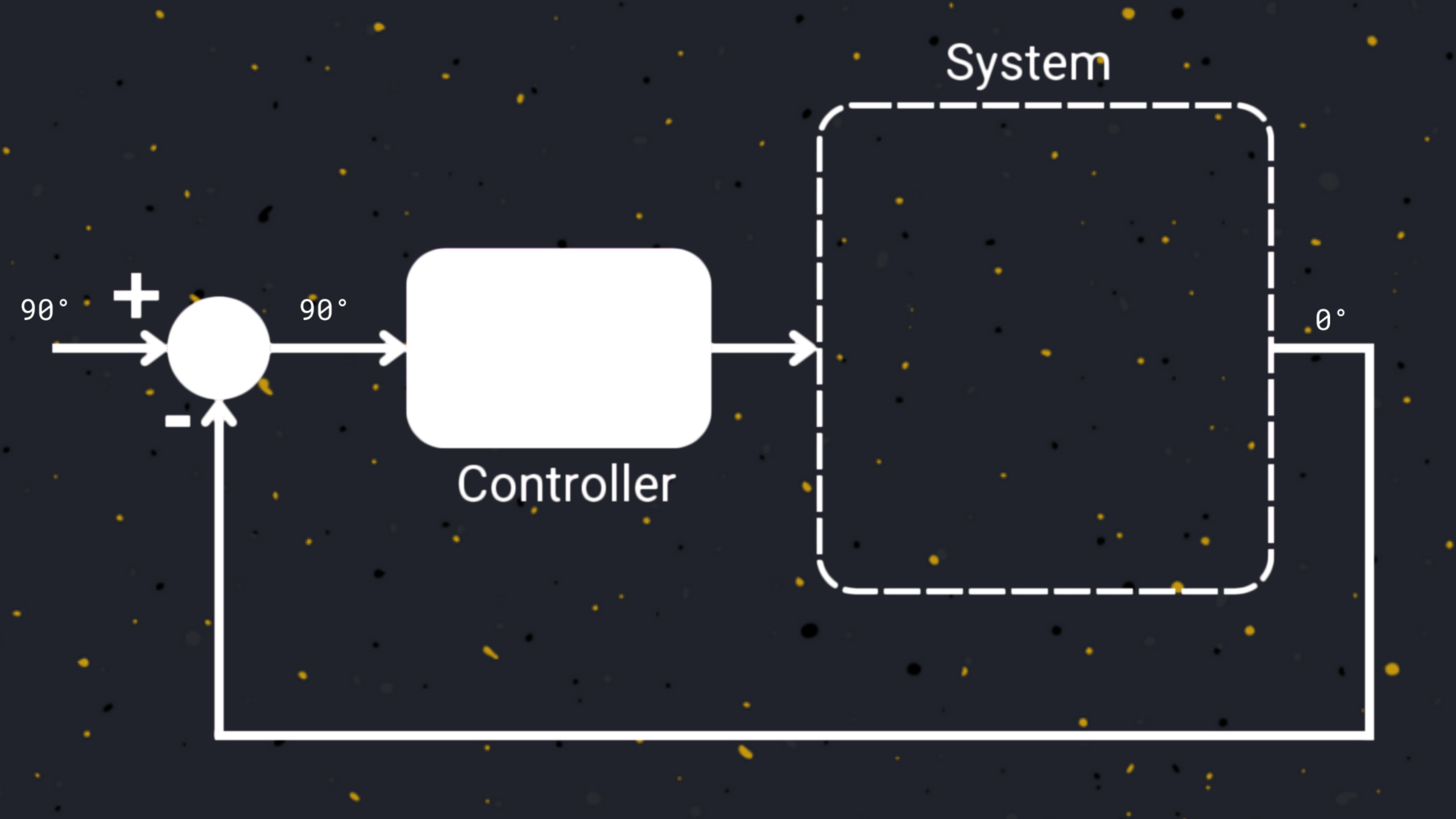

System
Desired
Position
+
-
Error
Controller
Command
Current
Position

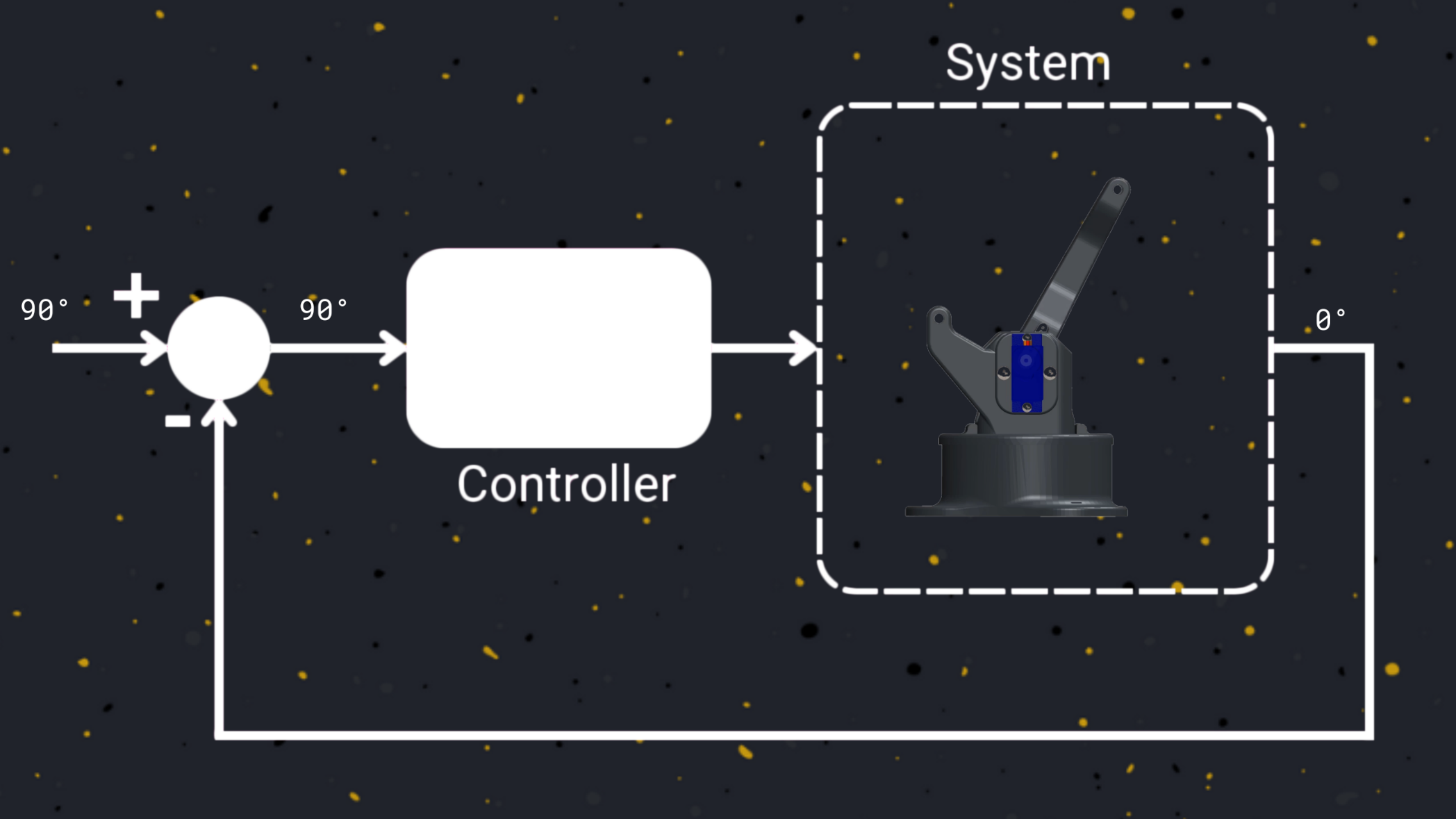

System
+
-
Controller

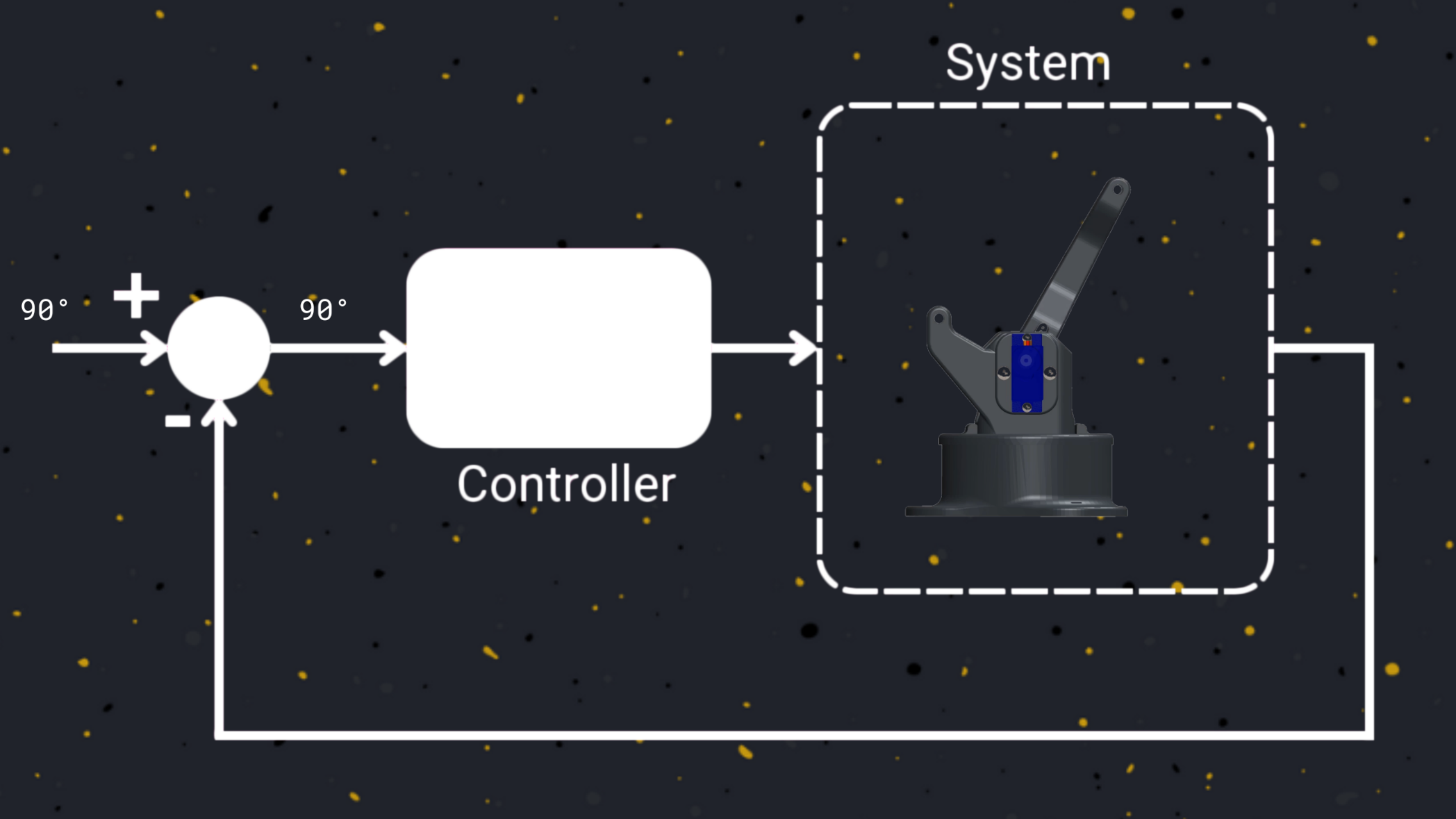

System
90°
+
-
Controller


System
90°
+
-
Controller
0°


System
90°
+
-
90°
Controller
0°


System
90°
+
-
90°
Controller
0°


System
90°
+
-
90°
Controller
0°


System
90°
+
-
90°
Controller

System

90°

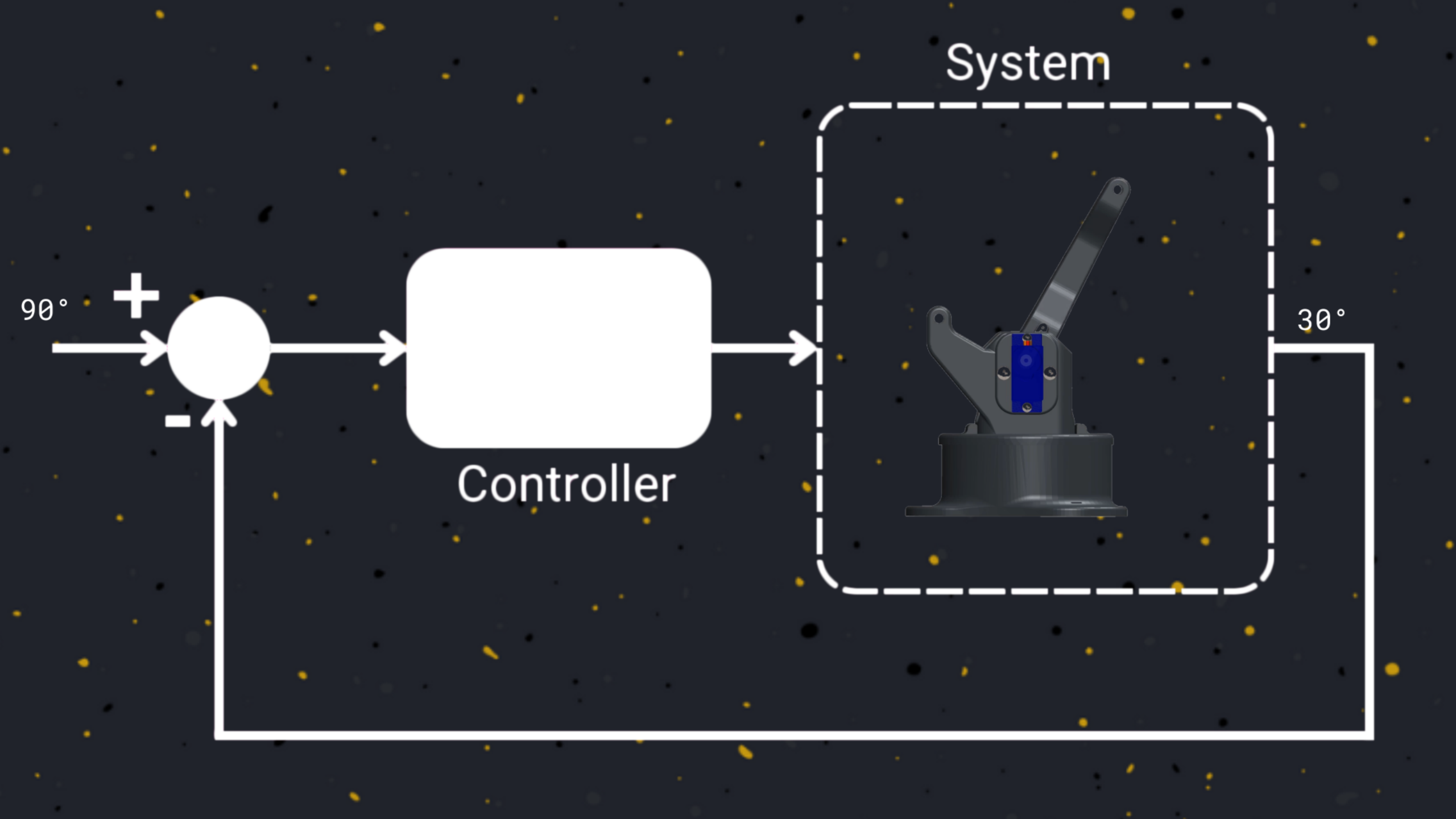
+

-

90°

Controller

30°


System
90°
+
-
Controller
30°

System

90°

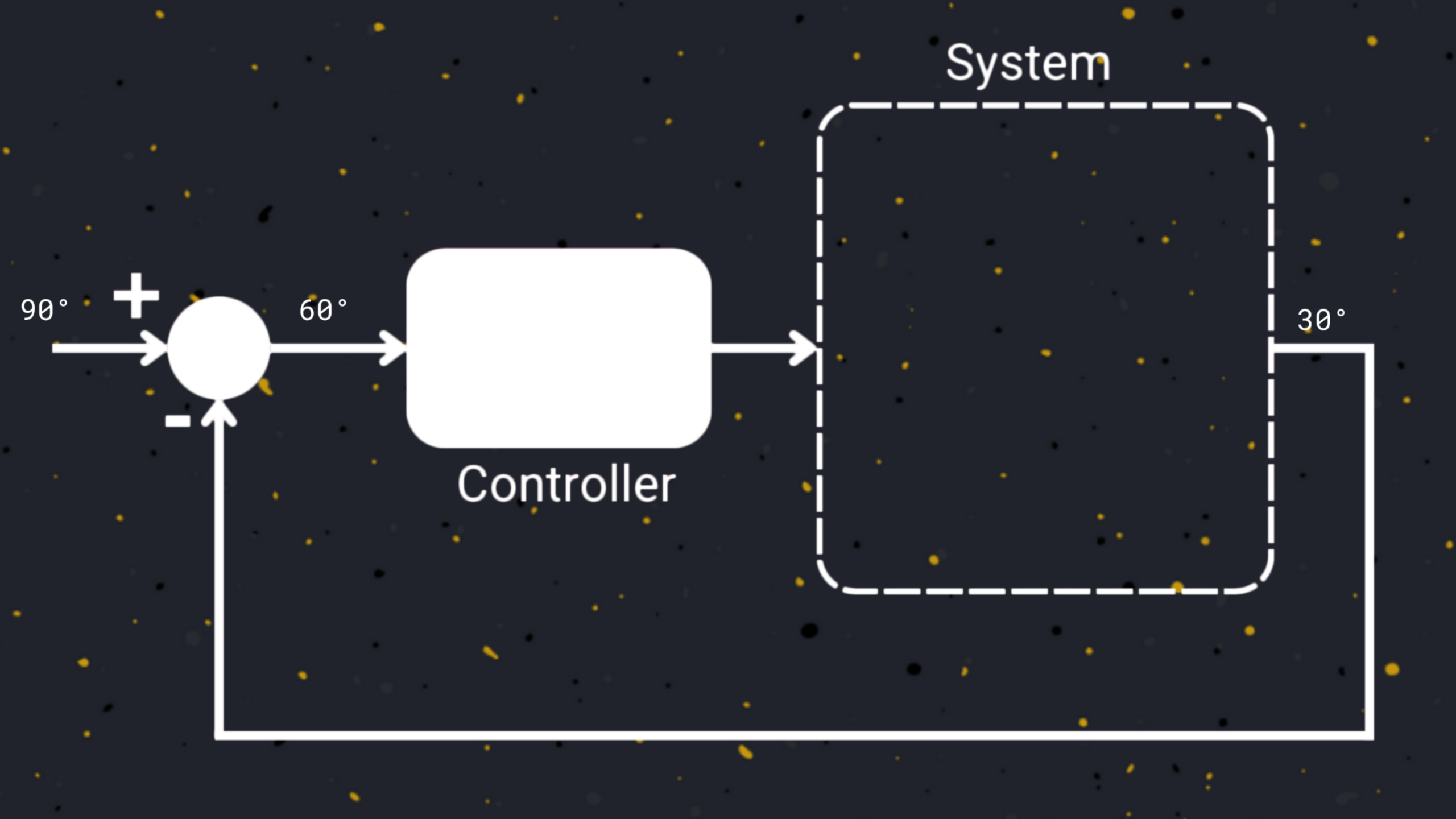
+

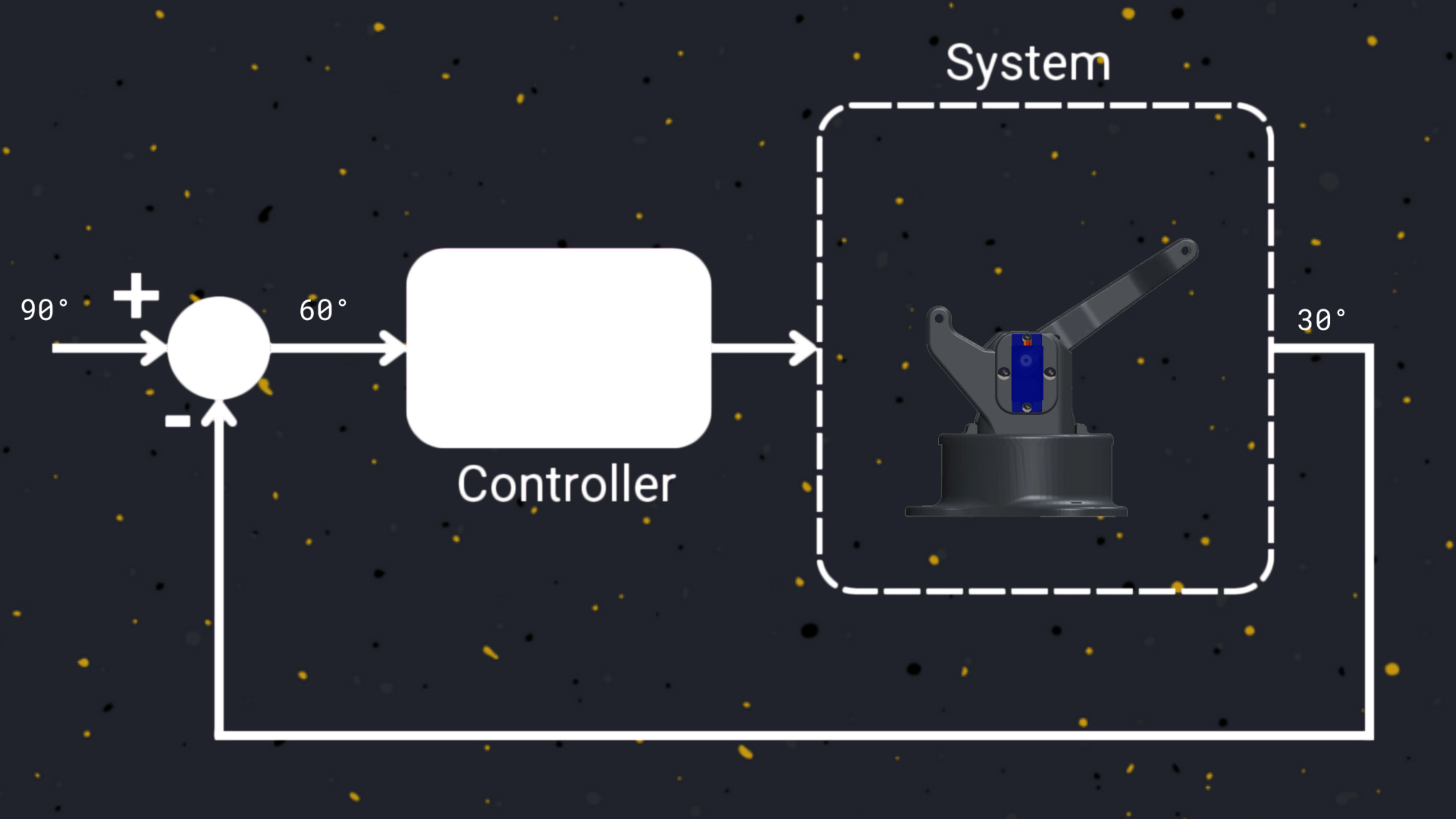
-

60°

Controller

30°


System
90°
+
-
60°
Controller
30°


System
90°
+
-
60°
Controller
30°

System

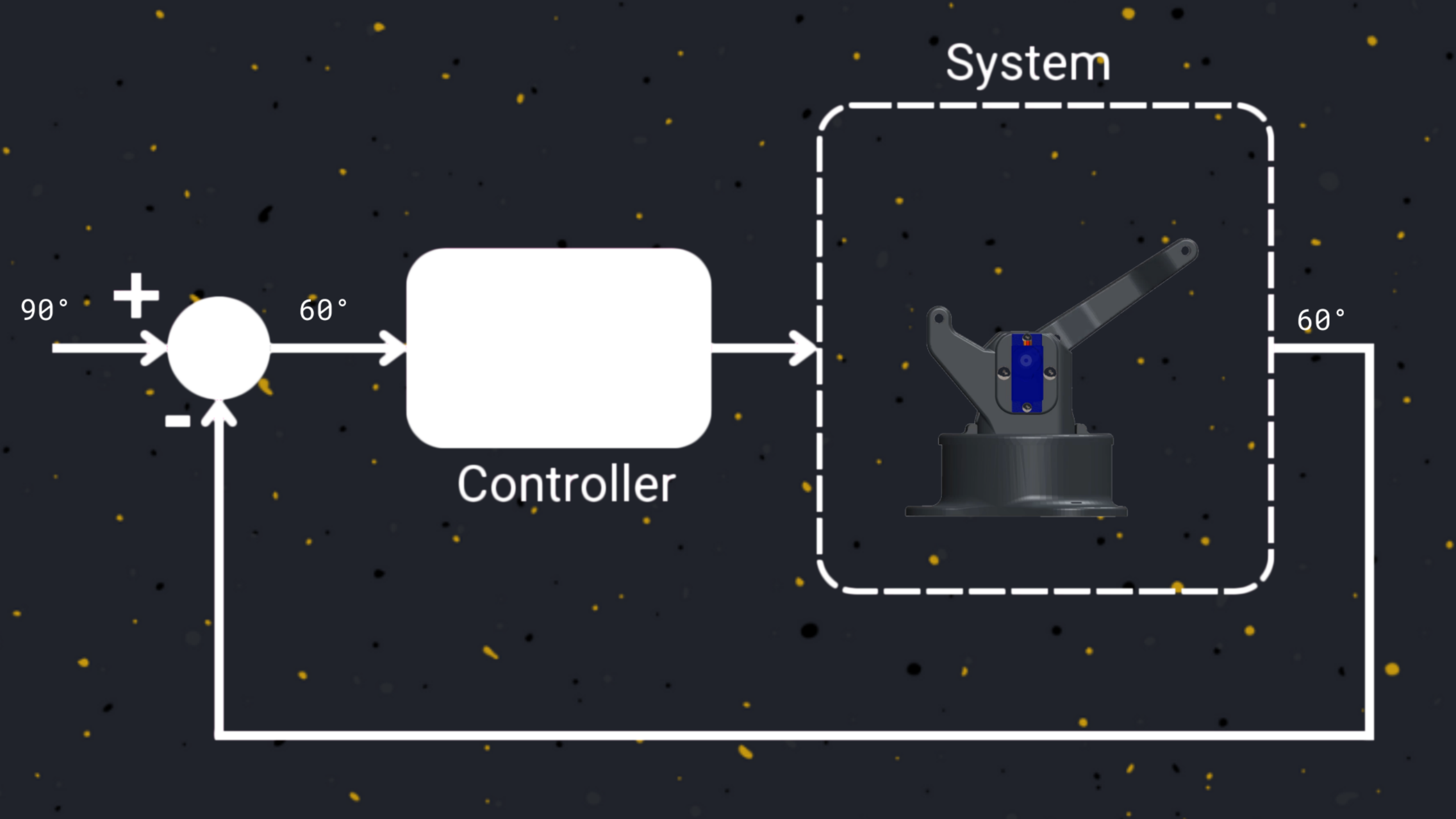
90°

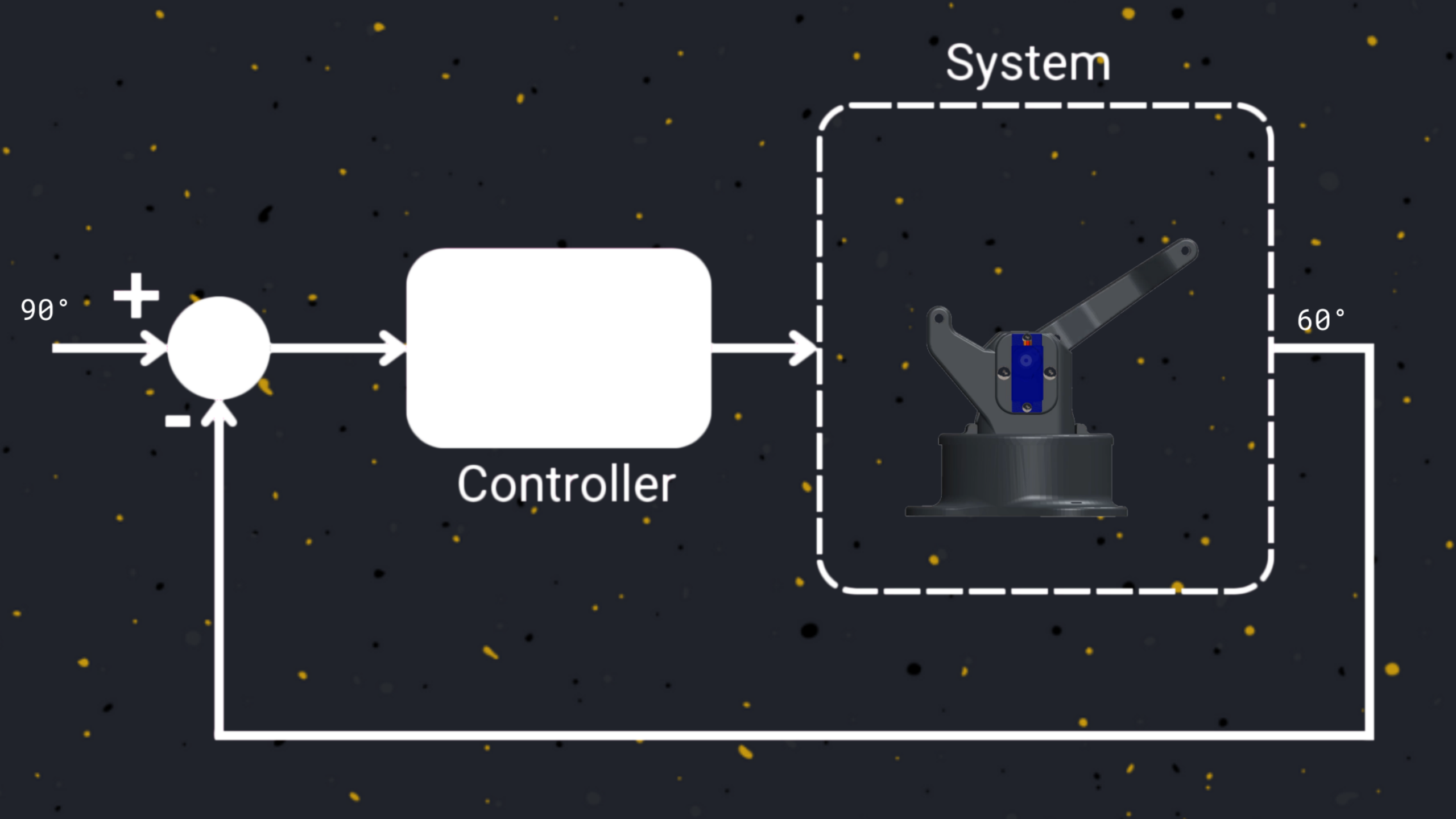
+

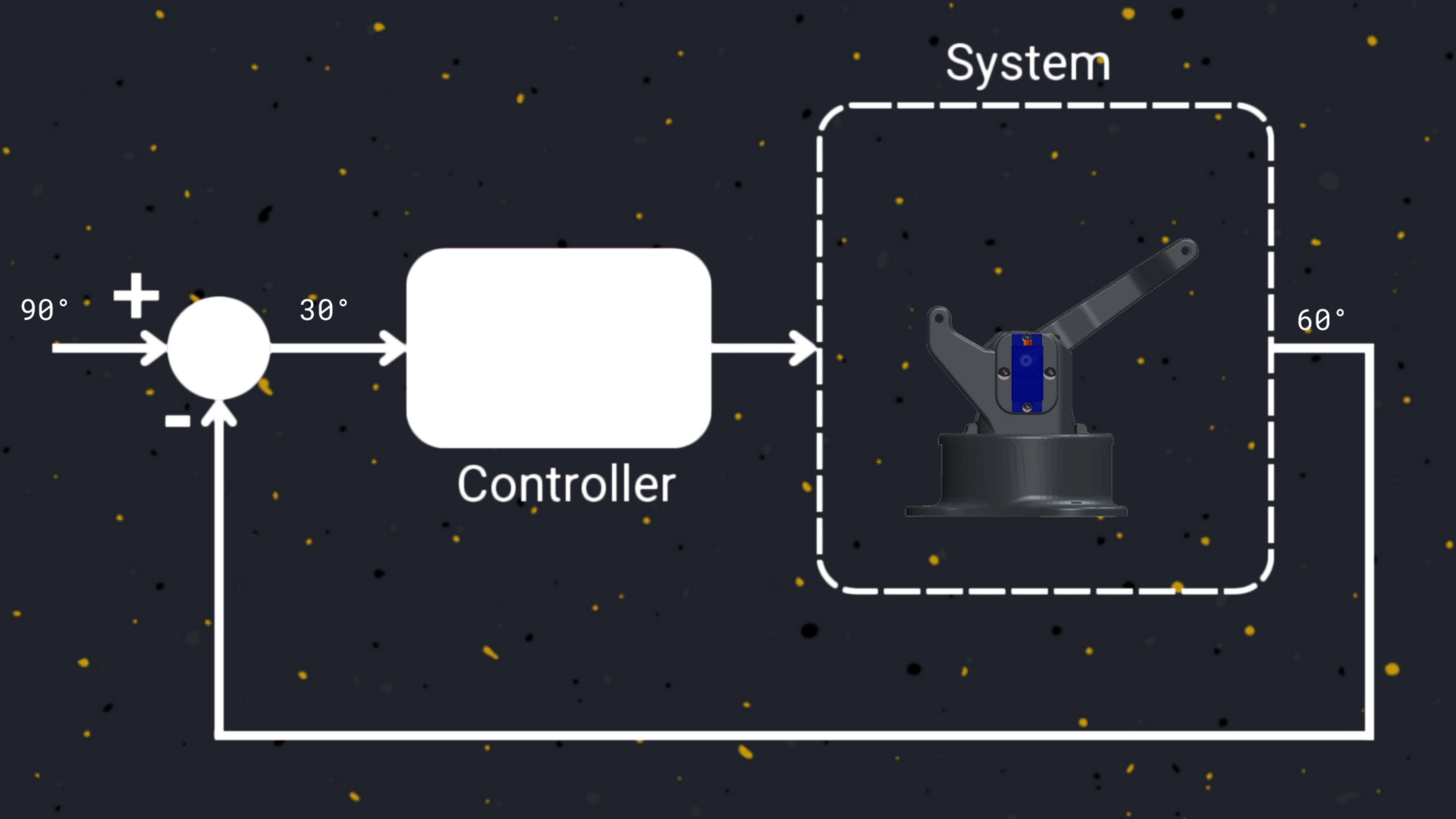
-

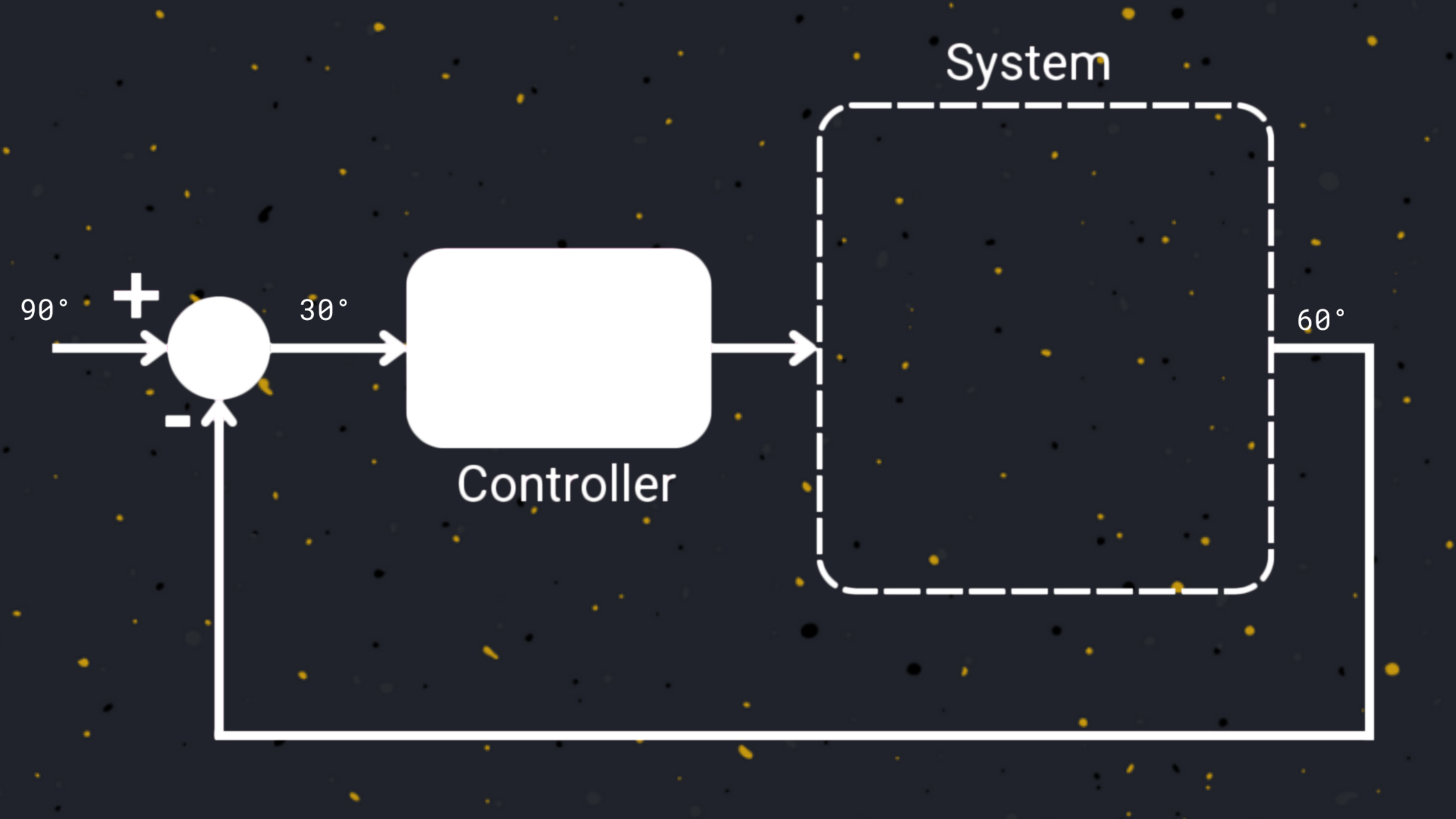
60°

Controller


System
90°
+
-
60°
Controller
60°


System
90°
+
-
Controller
60°


System
90°
+
-
30°
Controller
60°


System
90°
+
-
30°
Controller
60°

System

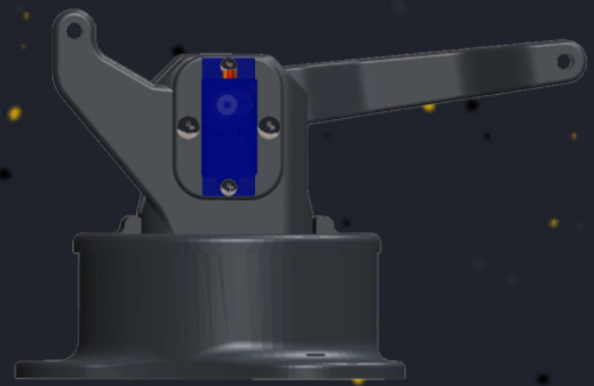
90°

+

-

30°

Controller



60°

System

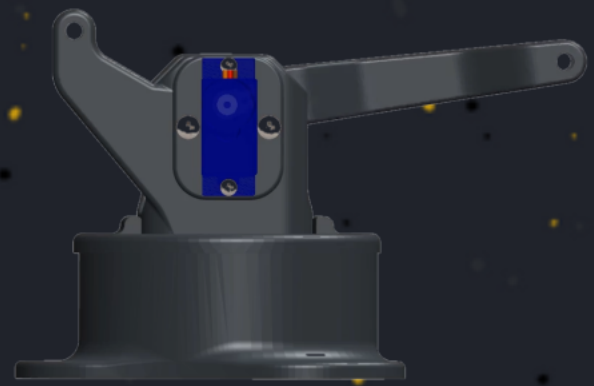
90°

+

-

30°

Controller



System

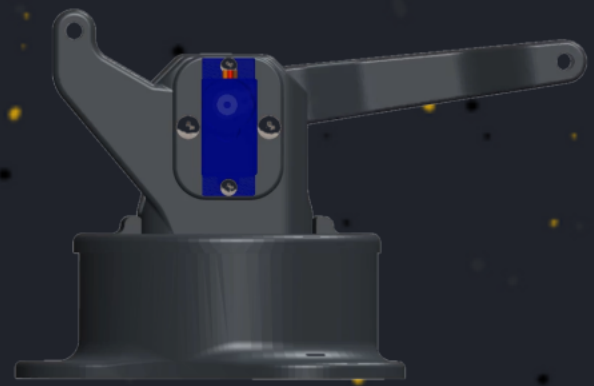
90°

+

-

30°

Controller



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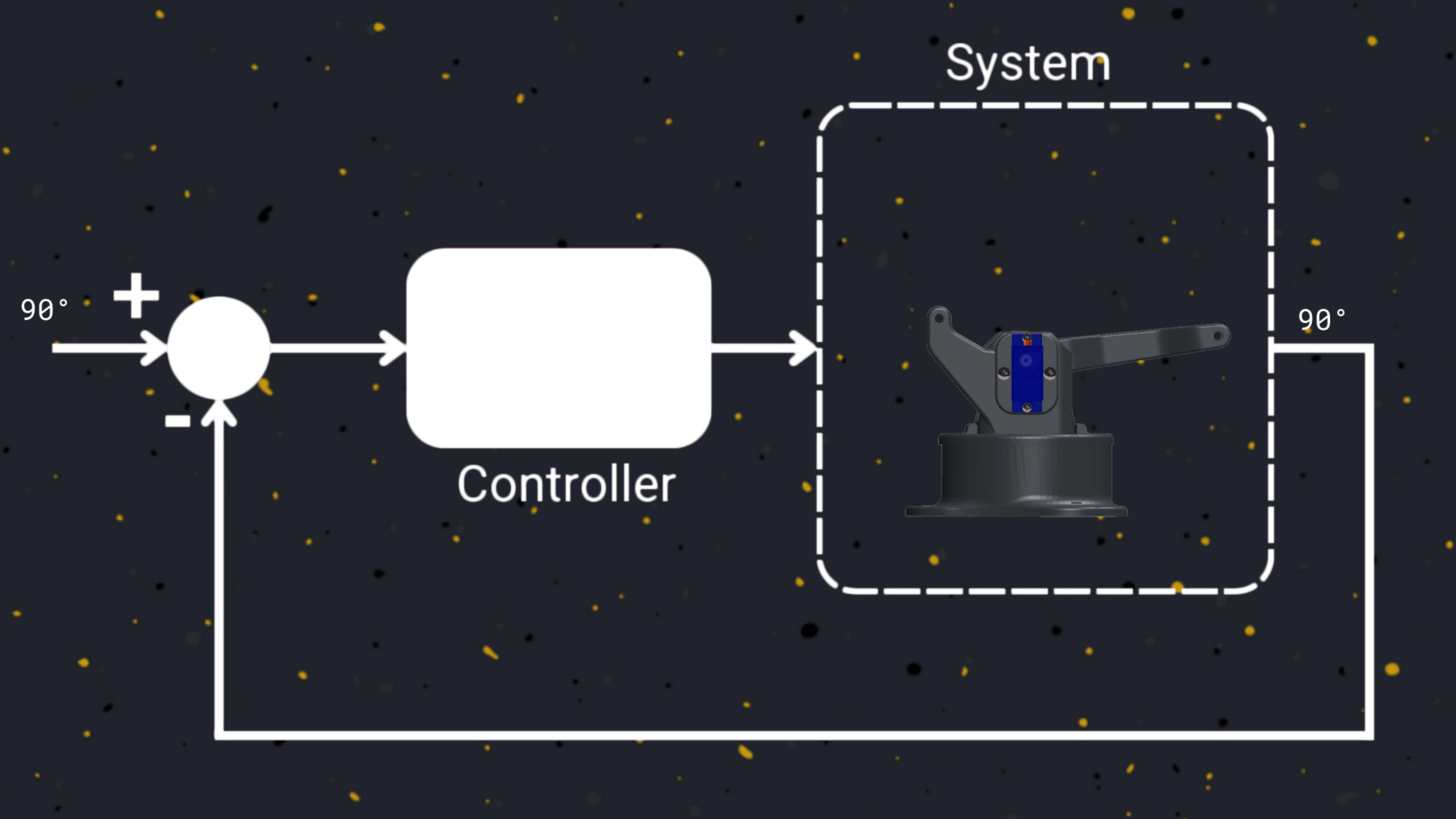
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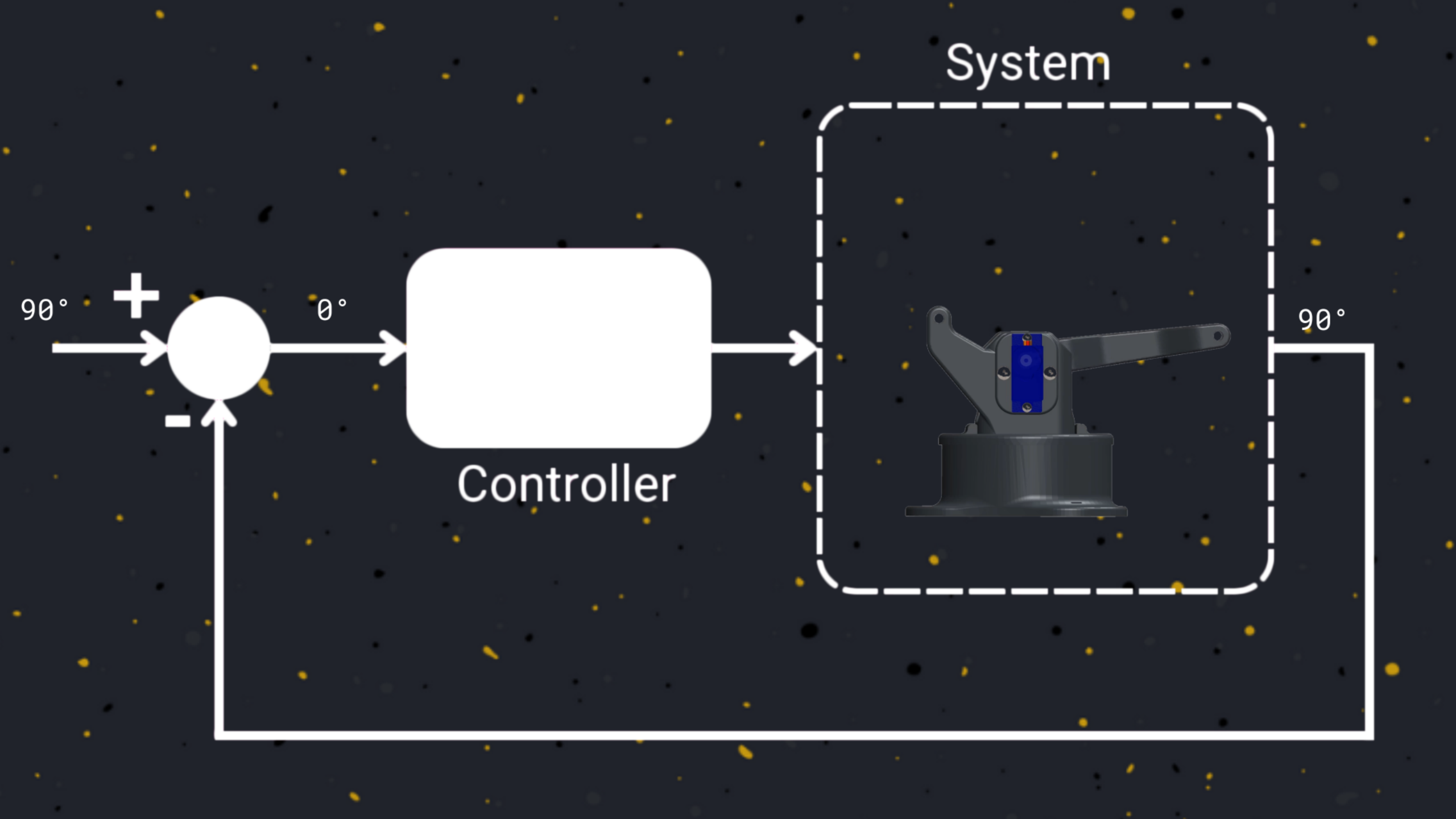
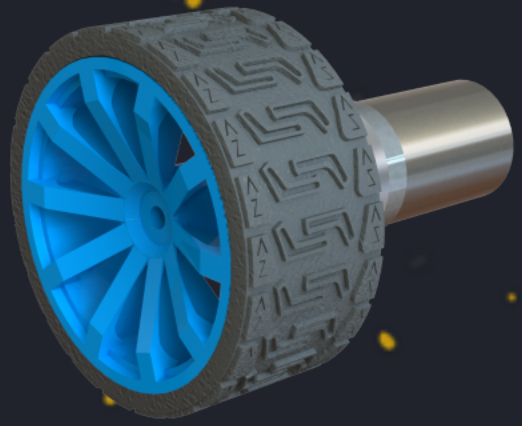
90°
+
-
Controller
90°

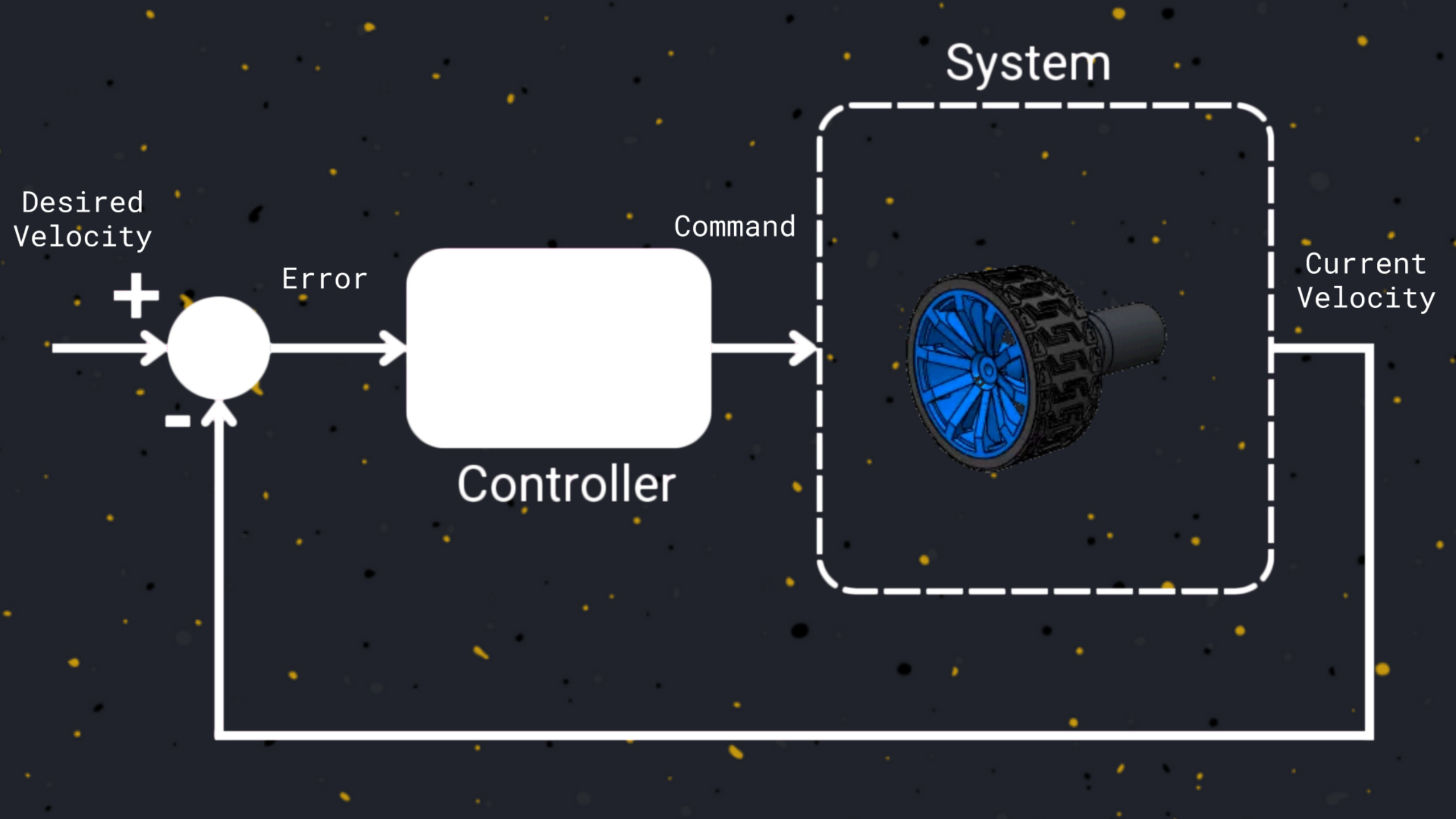

System
90°
+
-
0°
Controller
90°

Position

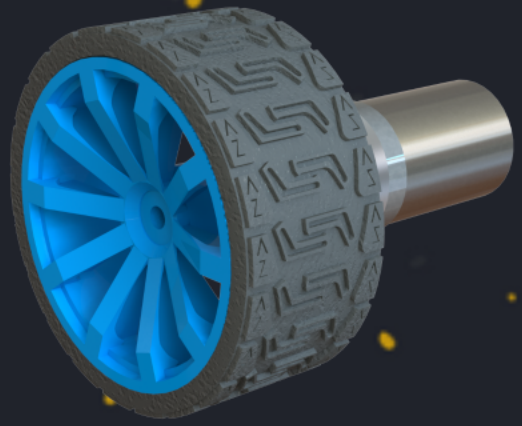


Velocity

Effort

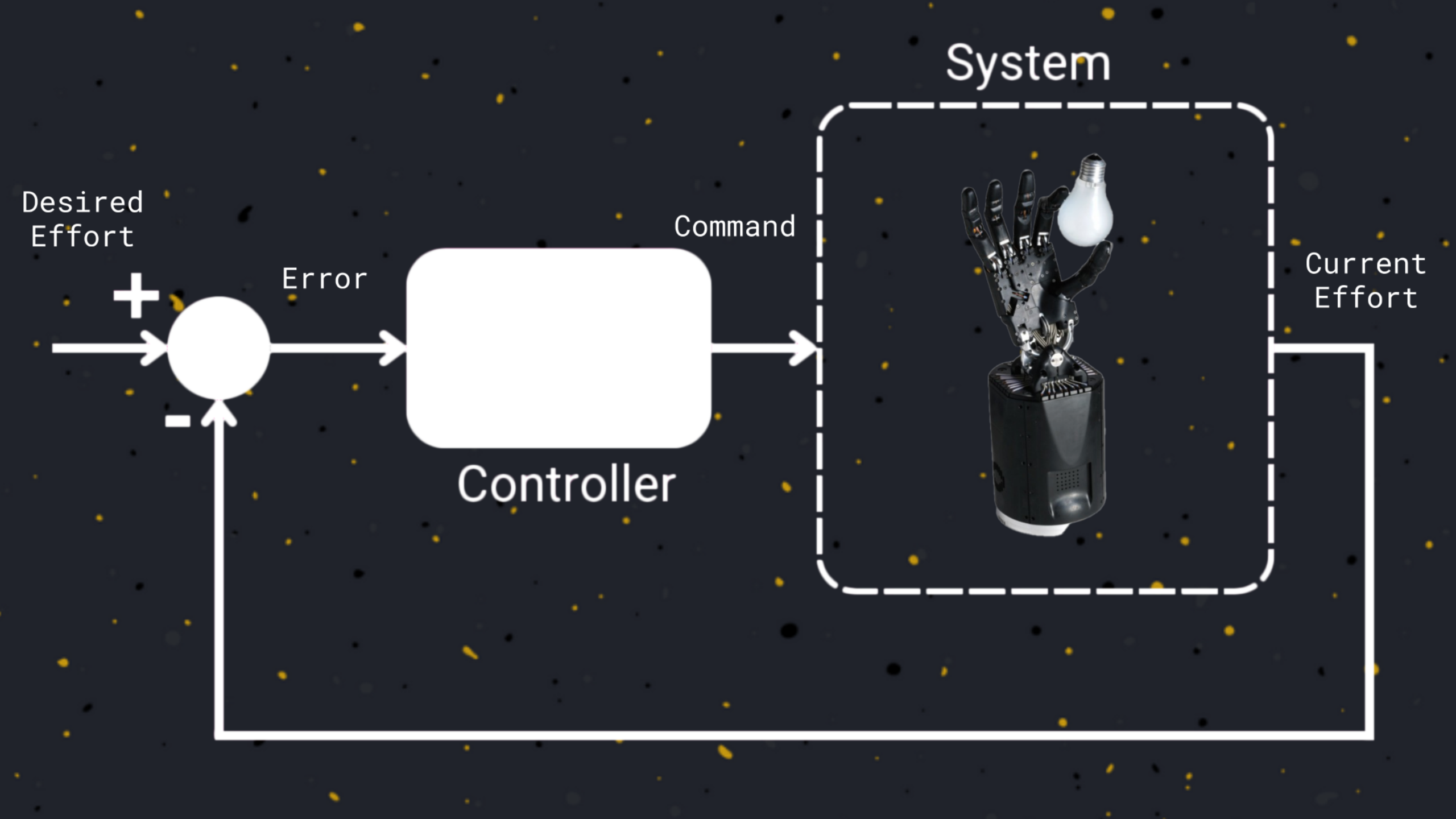

System
Desired
Velocity
+
-
Error
Controller
Command
Current
Velocity

Position

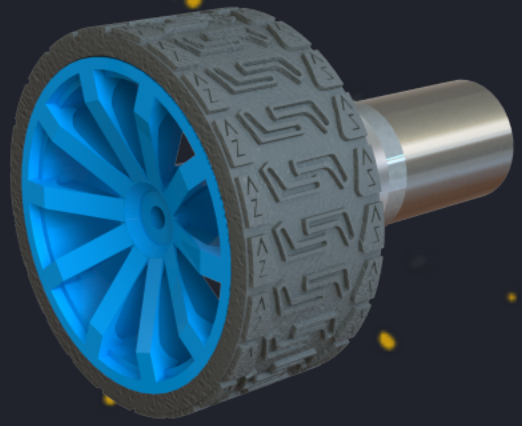


Velocity

Effort


System
Desired
Effort
+
-
Error
Controller
Command
Current
Effort

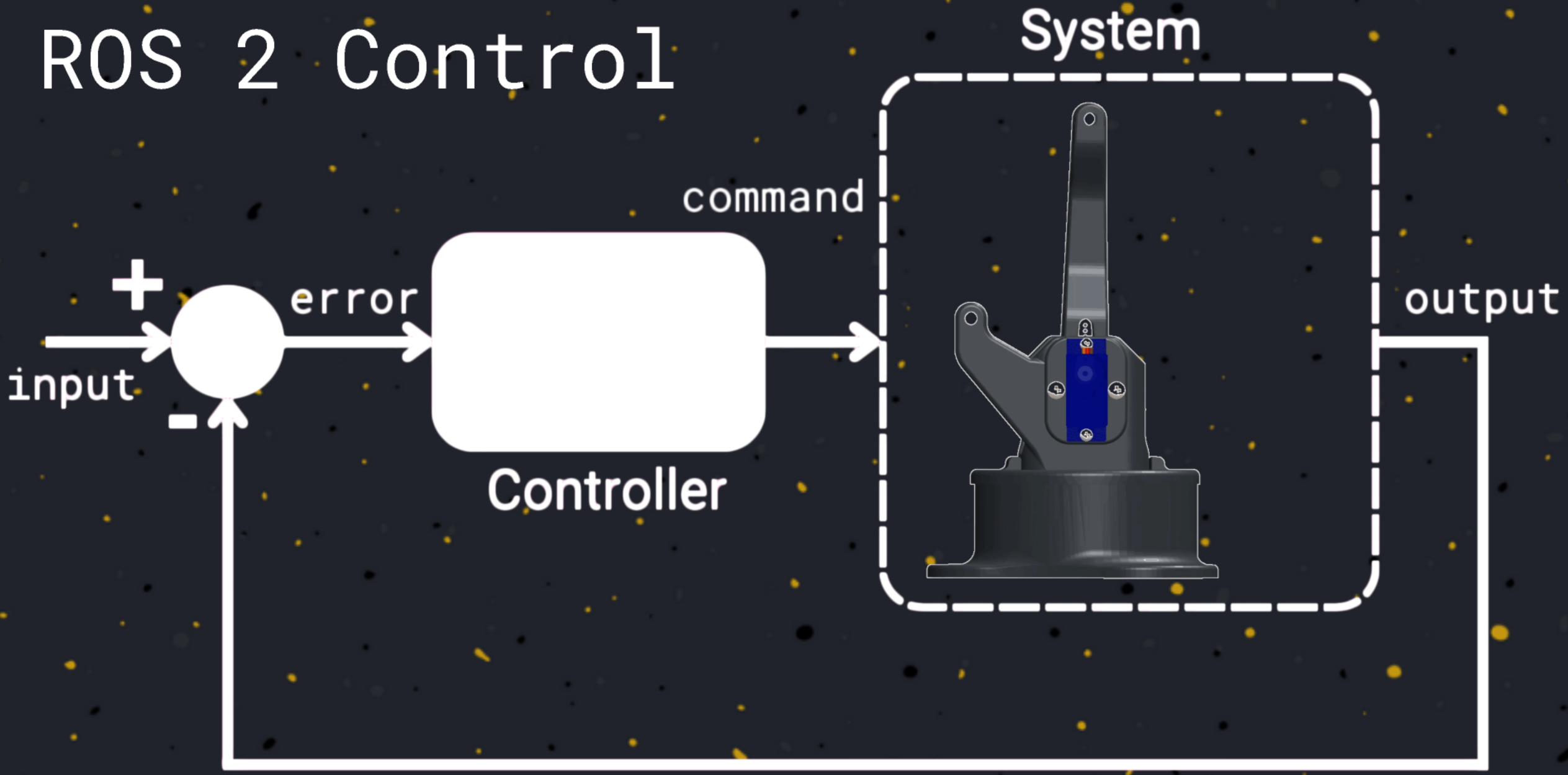
Position



Velocity

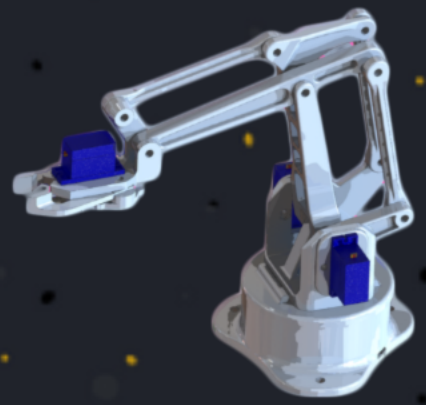
Effort

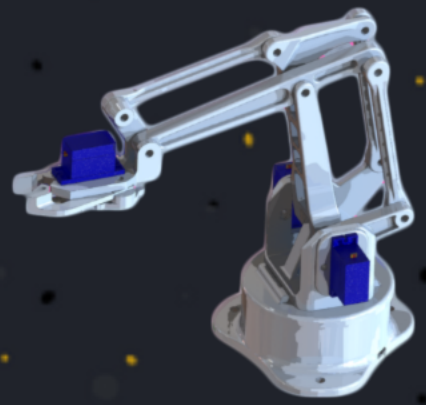
ROS 2 Control



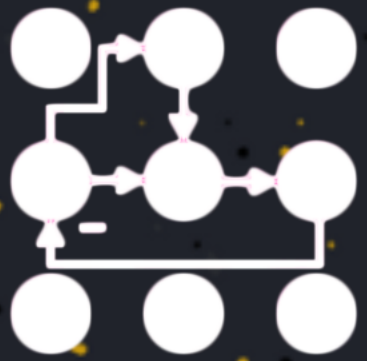
ros2_control

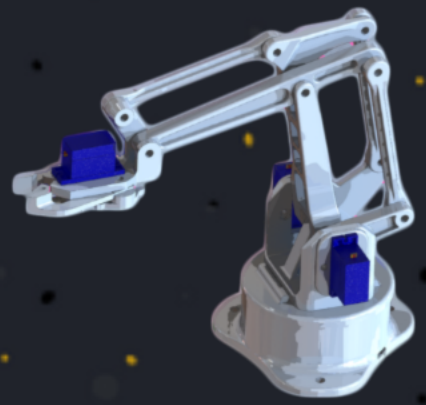
ros2_control



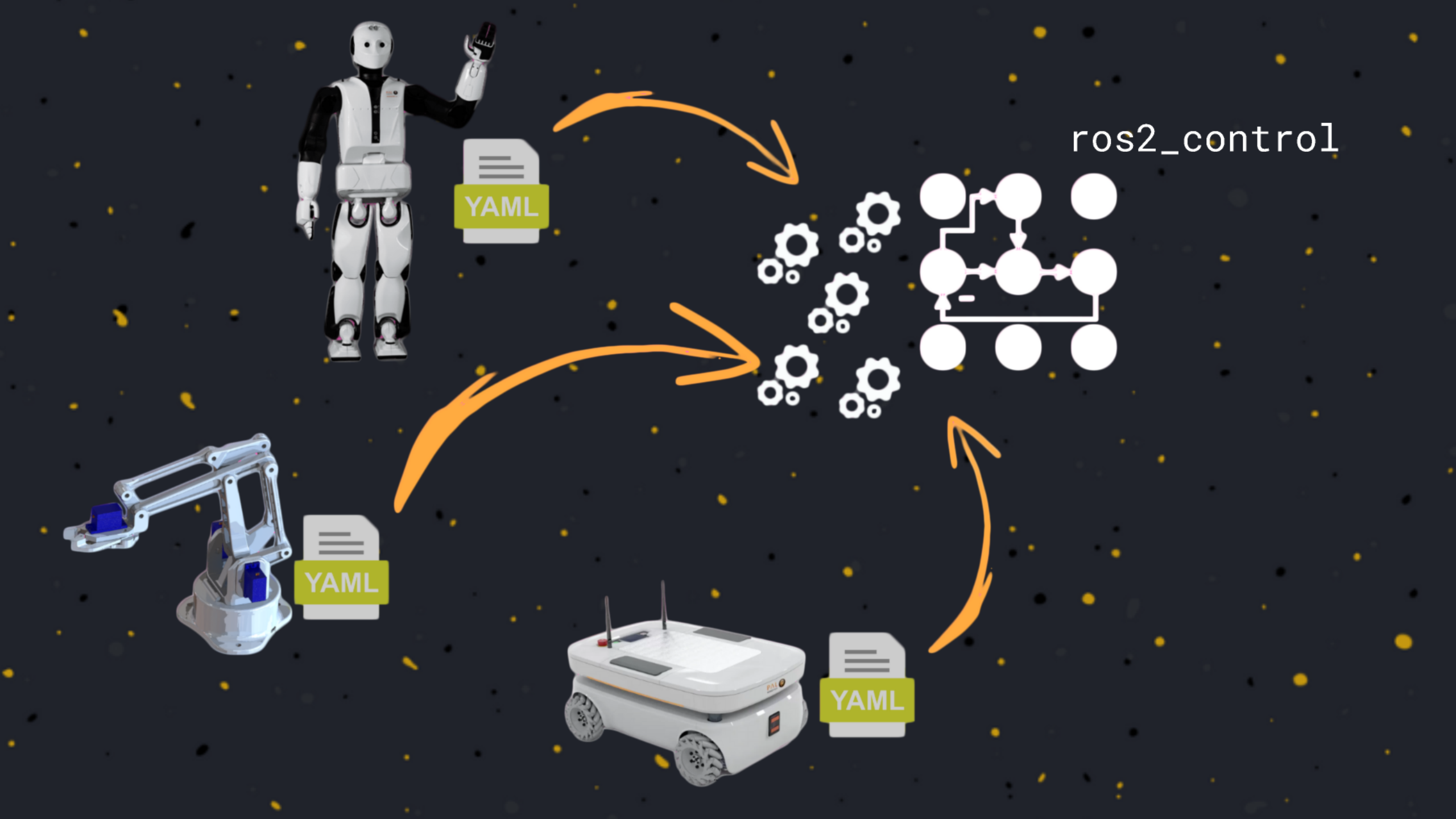


ros2_control



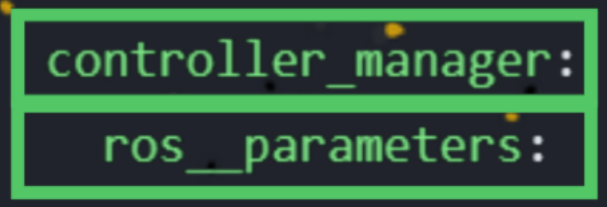


ros2_control

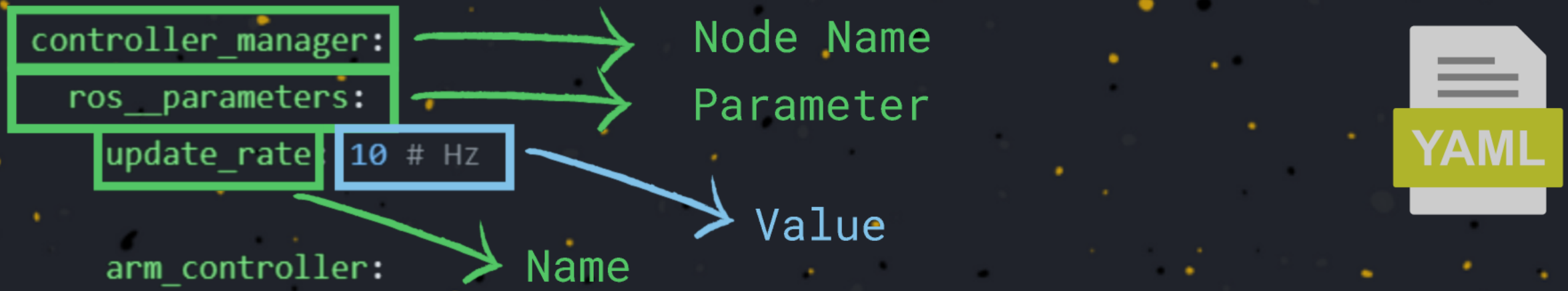

ros2_control
YAML
YAML
YAML

```yaml
controller_manager:
  ros__parameters:
    update_rate: 10 # Hz

    arm_controller:
      type: joint_trajectory_controller/JointTrajectoryController

    # gripper_controller:
    #   type: forward_command_controller/ForwardCommandController

    gripper_controller:
      type: joint_trajectory_controller/JointTrajectoryController

    joint_state_broadcaster:
      type: joint_state_broadcaster/JointStateBroadcaster
```

Node Name




```yaml
    update_rate: 10 # Hz

    arm_controller:
      type: joint_trajectory_controller/JointTrajectoryController

    # gripper_controller:
    #   type: forward_command_controller/ForwardCommandController

    gripper_controller:
      type: joint_trajectory_controller/JointTrajectoryController

    joint_state_broadcaster:
      type: joint_state_broadcaster/JointStateBroadcaster
```




```yaml
arm_controller:
  type: joint_trajectory_controller/JointTrajectoryController

# gripper_controller:
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gripper_controller:
  type: joint_trajectory_controller/JointTrajectoryController

joint_state_broadcaster:
  type: joint_state_broadcaster/JointStateBroadcaster
```
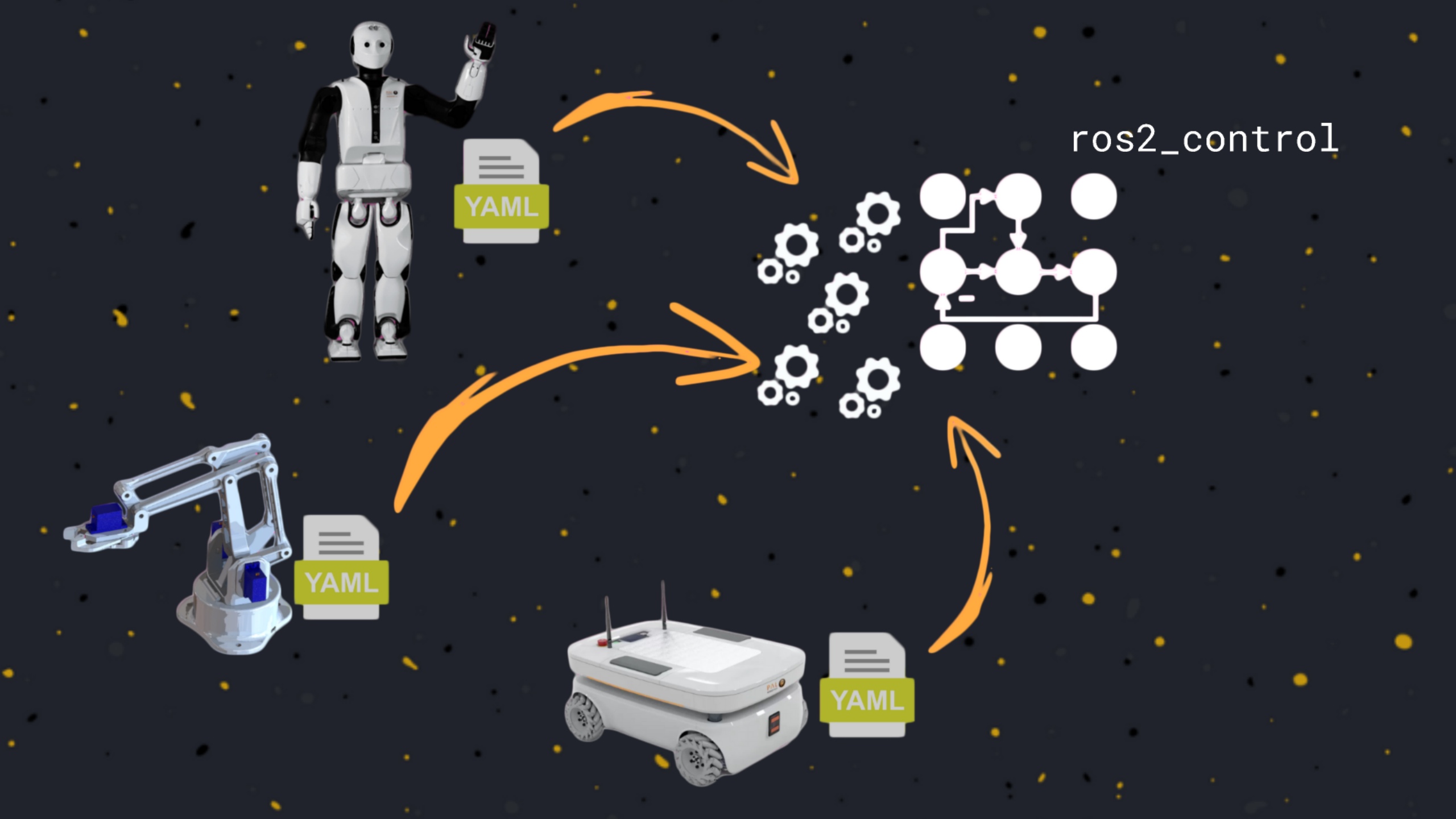
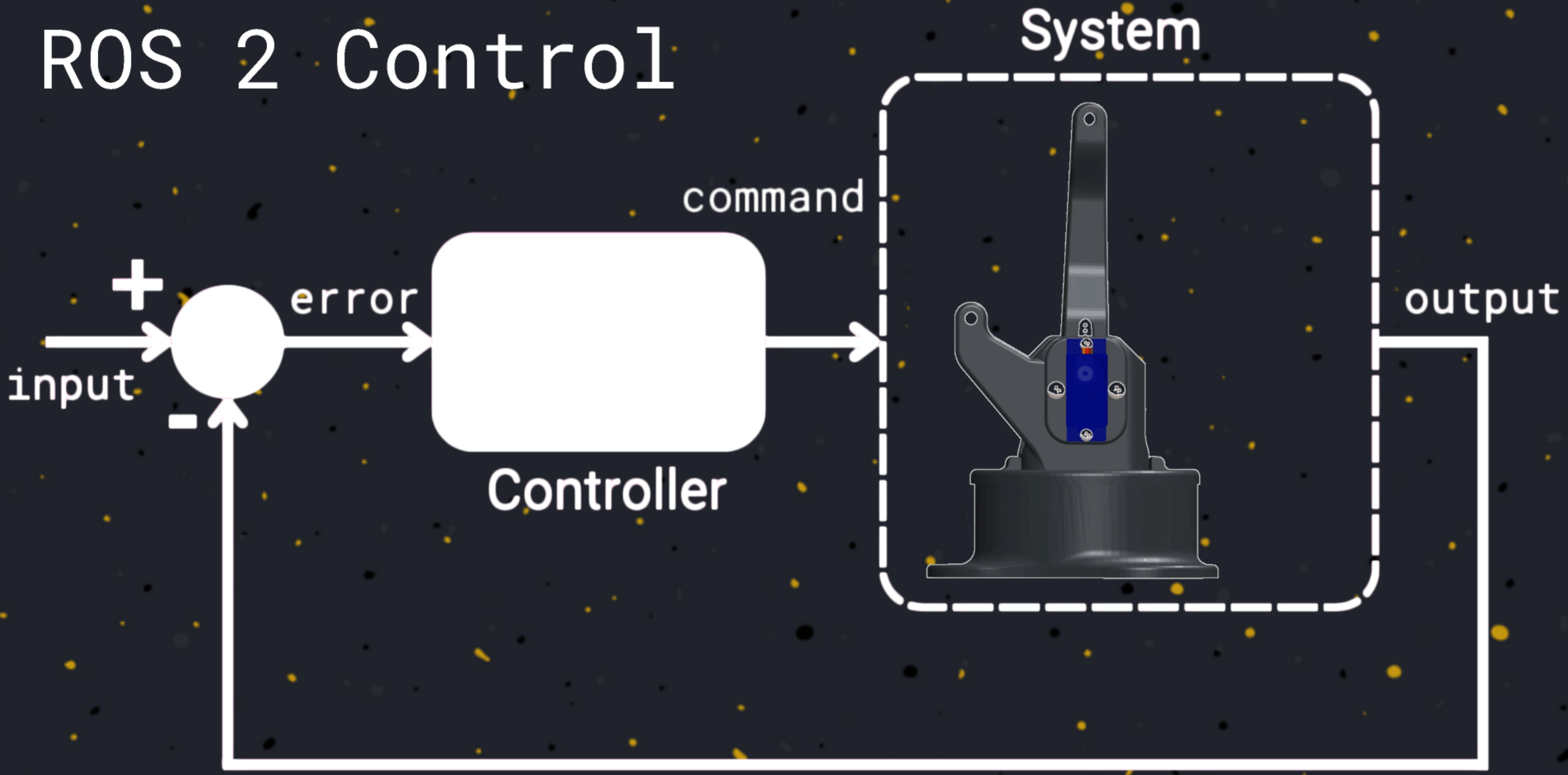


ros2_control
YAML
YAML
YAML

ROS 2 Control



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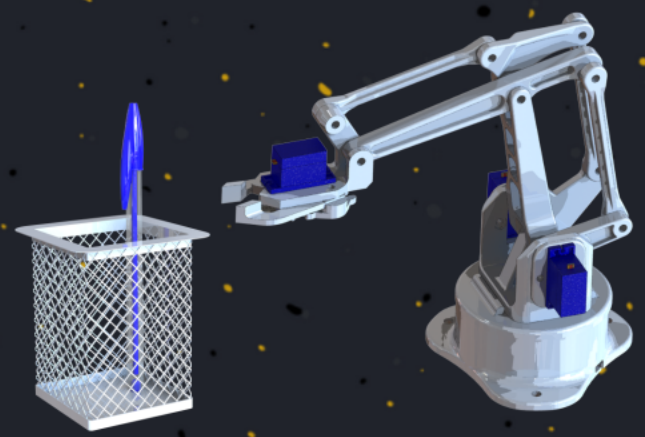

Conclusions

Build