

**Dr.SNS RAJALAKSHMI COLLEGE OF ARTS AND SCIENCE
(Autonomous)**

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Coimbatore- 49



**DEPARTMENT OF COMPUTER SCIENCE
(ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Setting up your robot

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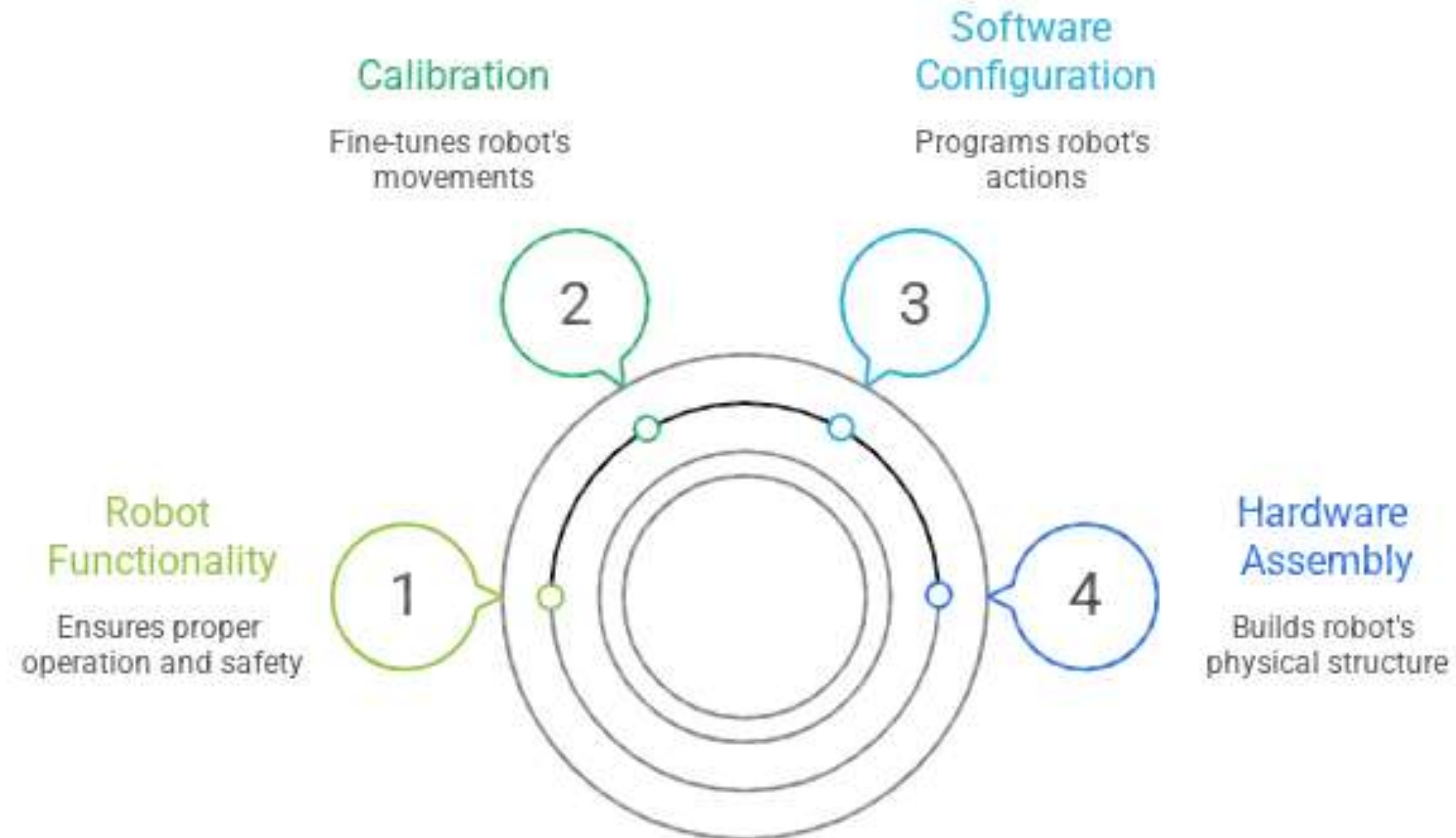
Department of Computer Science (AI&DS)

DT- Stages in a Setting up your robot:



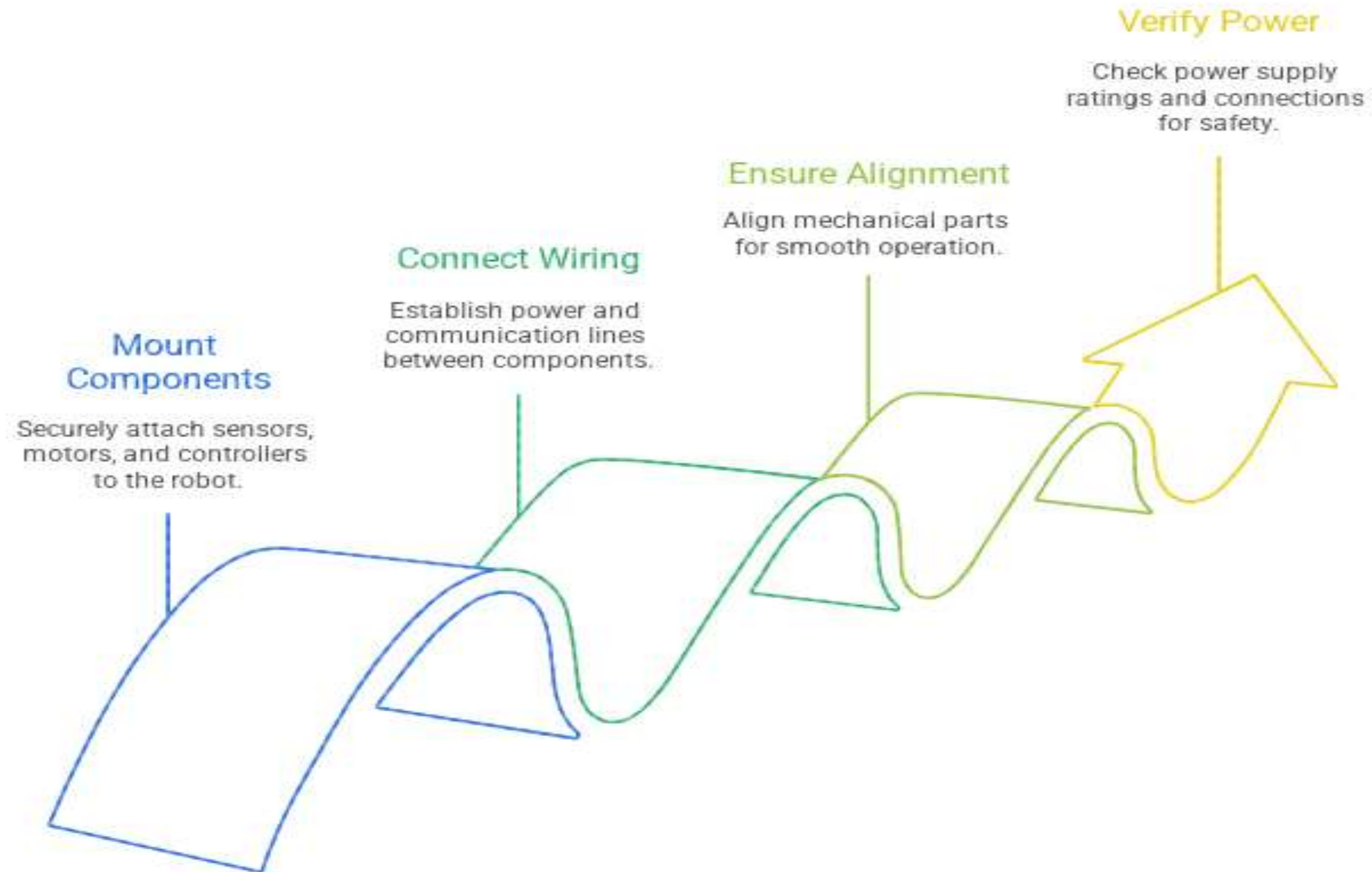
Stage	Description	Key Output
Hardware Setup	Assemble robot components, connect wiring, mount sensors & actuators.	Complete physical robot build.
Software Installation	Install OS, frameworks (ROS), drivers, firmware.	Robot software environment ready.
Calibration	Adjust sensors, define joint limits, tune PID.	Accurate sensor readings & motion.
Testing & Validation	Verify movement, data flow, sensor accuracy.	Functioning and error-free system.
Safety Setup	Configure E-Stop, speed limits, secure cables.	Safe and stable robot operation.
Documentation	Record setup steps, versions, connections.	Reference guide for future use.

Robot Setup Process



Hardware Assembly

Building a Functional Robot



Setting Up Robotics Software

Load Firmware

Load the necessary firmware or controller software for the robot.

Set Interfaces

Establish communication interfaces like USB, CAN, UART, and Ethernet.

Configure Drivers

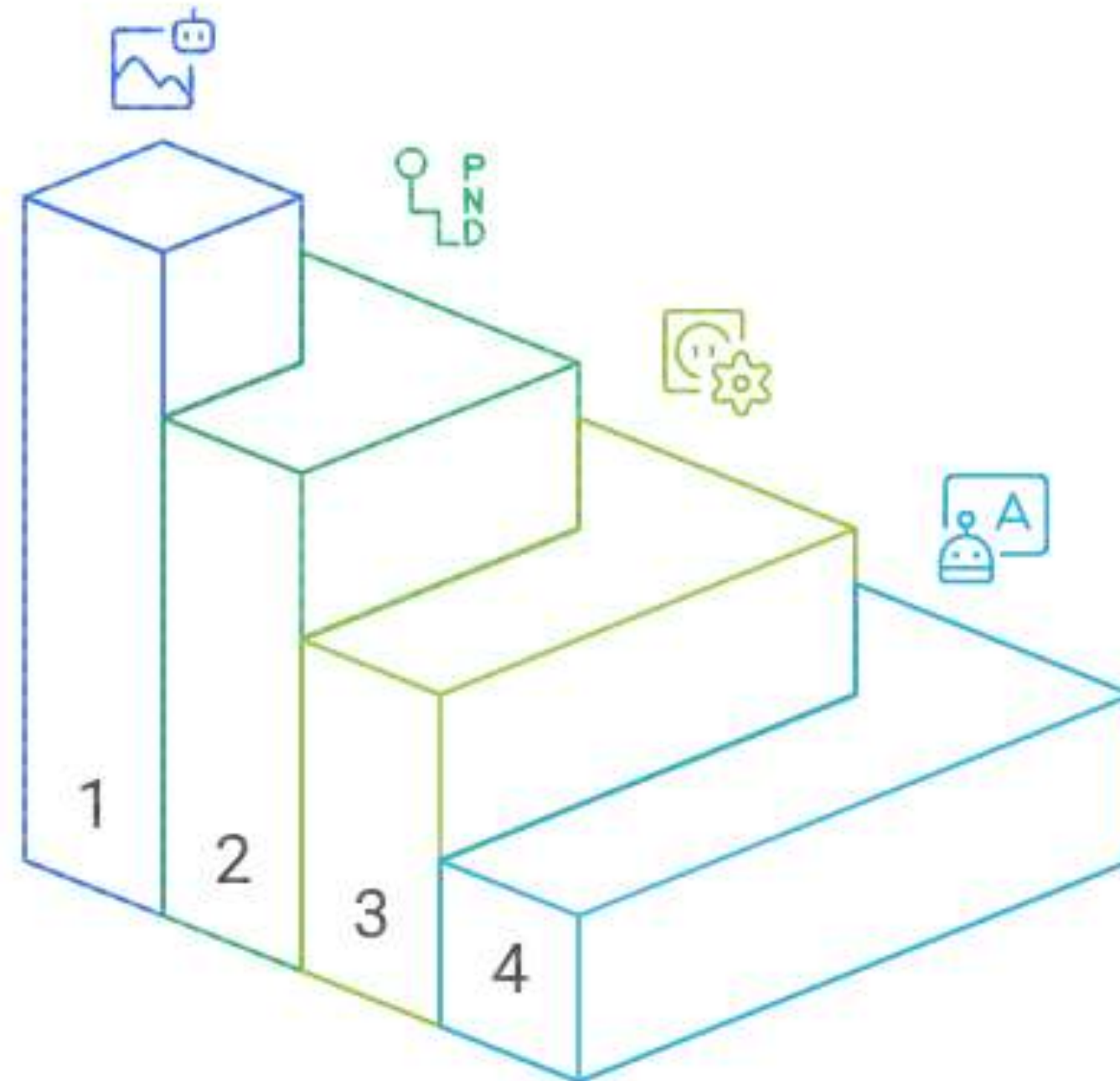
Set up drivers for sensors and actuators to ensure proper functionality.

Install OS

Install the robot's operating system, such as ROS.



Achieving Precise Robot Control



Calibrate Sensors

Ensure accurate data input from cameras, IMUs, and LiDAR.

Set Motor Positions

Define zero positions and limits for motor movements.

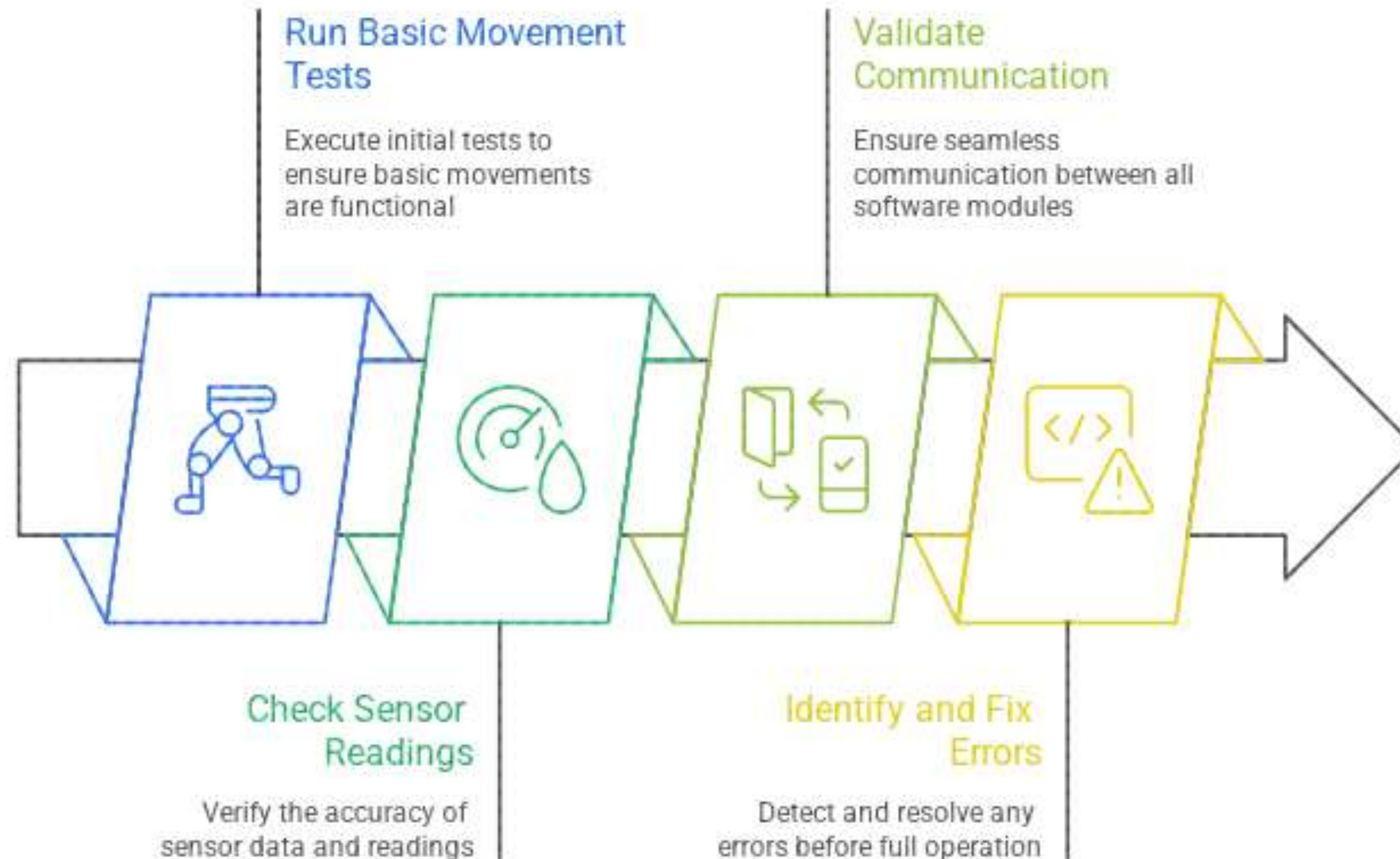
Adjust PID Values

Fine-tune PID controllers for stable and responsive control.

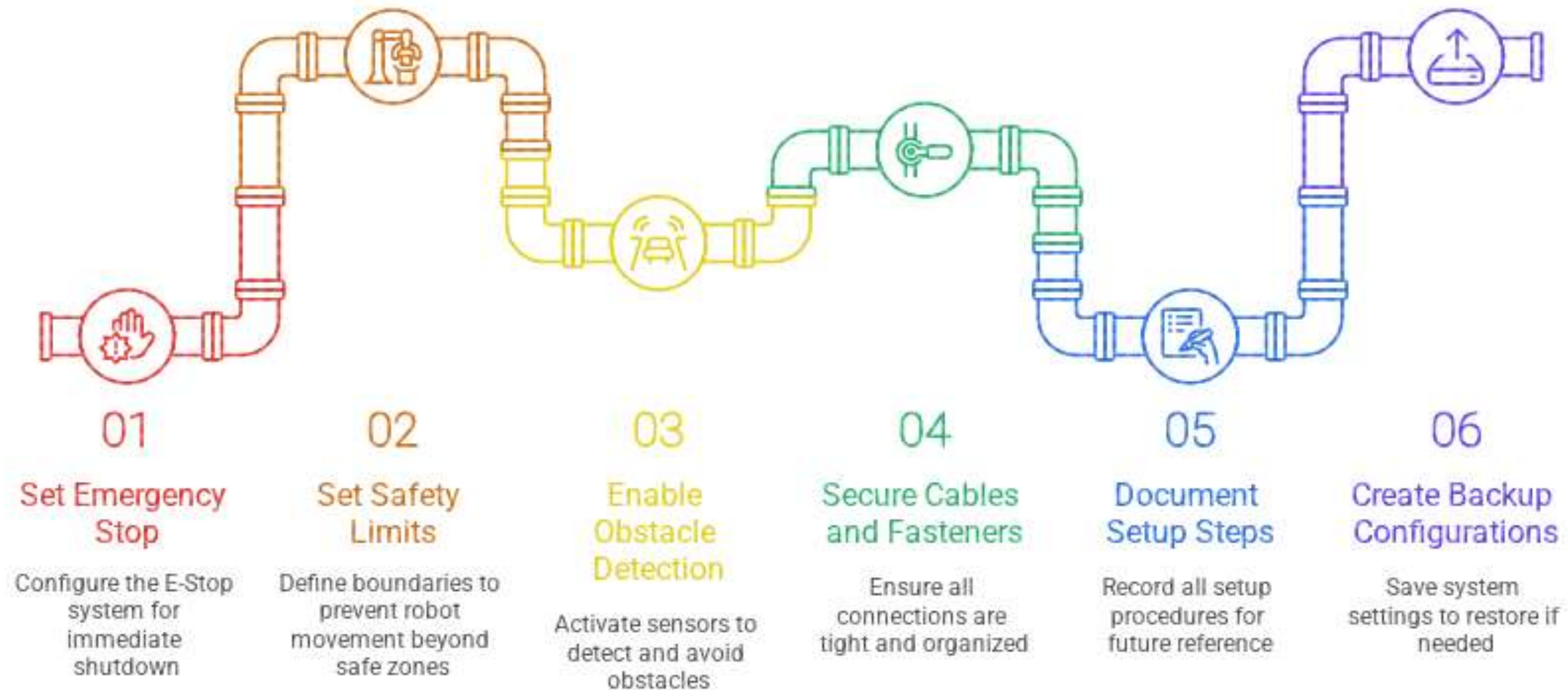
Test Accuracy

Verify precision through trial movements and adjustments.

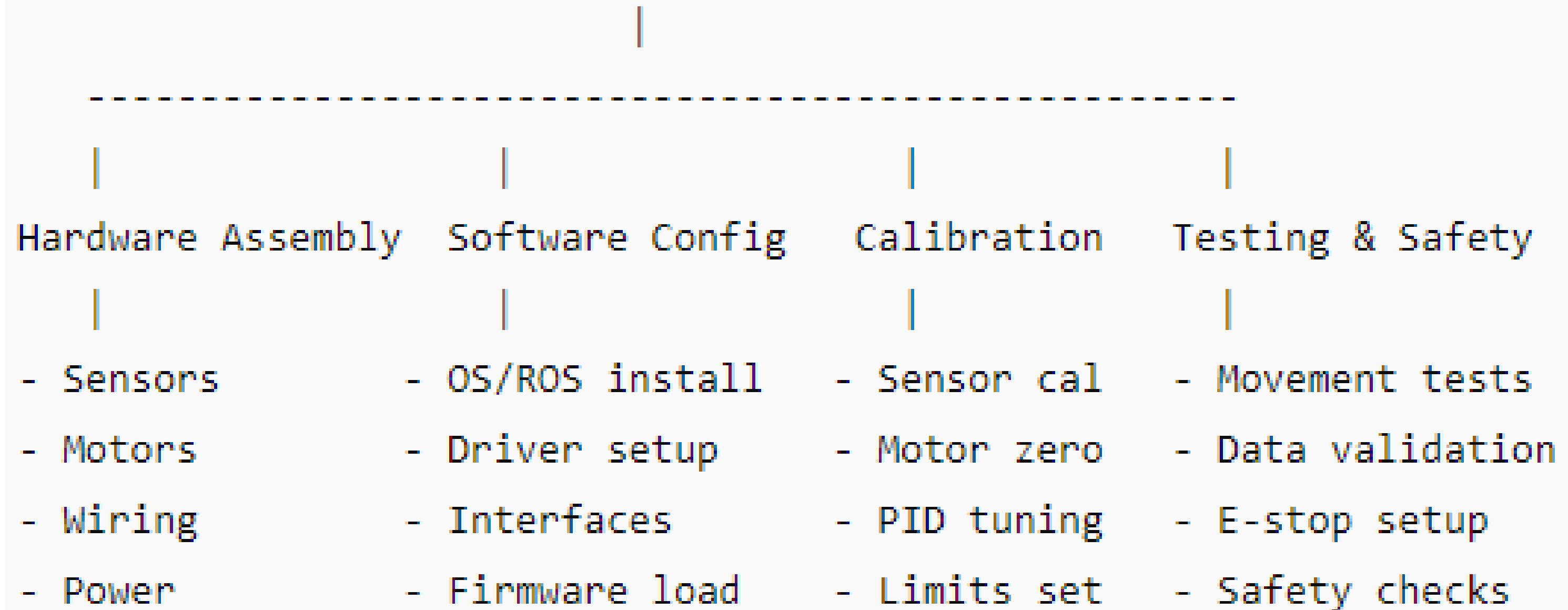
Robotics Software Testing and Validation Process



Robotics Safety and Setup Sequence



SETTING UP YOUR ROBOT



Robotics Setup Stages

Which step ensures sensors and motors are physically attached correctly?

Hardware assembly

Installing ROS and drivers is part of which stage?

Software configuration

Setting motor zero positions is done during:

Calibration

Which step checks accuracy of sensor readings?

Testing & validation



THANK YOU