**README File**

This README file provides an overview and summary of the contents of the internship report. The report details various aspects of the project, including the introduction, robot kinematics, Aruco markers, the role of the ESP8266 Wi-Fi module in Image-Based Visual Servoing (IBVS), and IBVS simulation.

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**Introduction**

The introduction section of the report provides a general overview of the project, its objectives, and the significance of the research conducted during the internship.

**Robot Kinematics**

This section delves into the fundamental concepts of robot kinematics, including:

* **Forward Kinematics:** Calculating the pose of the end-effector from known joint variables using mathematical transformations.
* **Inverse Kinematics:** Determining the joint parameters to achieve a desired position and orientation of the end-effector.
* **Mechanism and Mobility:** Explaining degrees of freedom (DOF), Grübler's Law, and the mobility of mechanisms.
* **End-Effectors and Robotic Arms:** Discussing the design and control of grippers and manipulators, with different types of grippers (mechanical, vacuum, magnetic).

**Aruco Markers**

Aruco markers are fiducial markers used in computer vision for tasks like camera pose estimation and object tracking. The section covers:

* **Structure and Characteristics:** Description of Aruco markers' design and internal binary patterns.
* **Applications:** Various applications including camera calibration, pose estimation, 3D reconstruction, and human-computer interaction (HCI).

**ESP 8266 Wi-Fi Module in IBVS**

The ESP8266 module plays a crucial role in wireless communication for IBVS systems. This section includes:

* **Key Features:** Wi-Fi connectivity, low power consumption, microcontroller integration, and programming flexibility.
* **Importance in IBVS:** Benefits of wireless communication in IBVS, such as flexibility, mobility, remote operation, and ease of deployment.
* **Applications:** Real-time data transmission, remote control, and monitoring, and integration with cloud services.

**IBVS Simulation**

For IBVS simulation, specific software and tools are required. This section outlines:

* **Ubuntu 20.04:** Features of this long-term support release and its suitability for robotic projects.
* **ROS Noetic:** Details about this final LTS release of the ROS 1 distribution, including its compatibility with Python 3.
* **Gazebo:** Description of this open-source robotics simulator and its integration with ROS for realistic simulation of robotic systems.

**Bibliography**

The bibliography section lists the references and resources used throughout the report, including links to relevant articles, tutorials, and documentation.