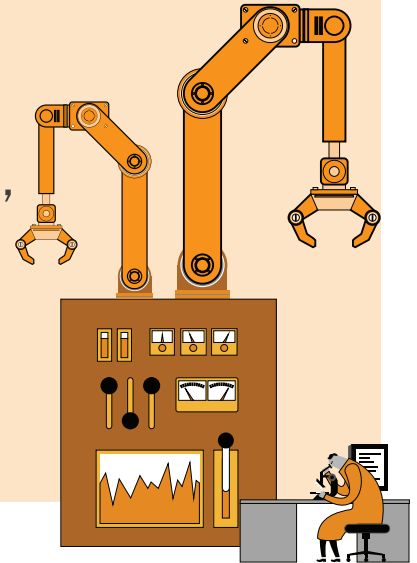


CONCEPT Communications protocols are a set of rules and standards that govern the exchange of information between electronic devices. In robotics, these protocols ensure that different components of the system can communicate with each other effectively and efficiently, regardless of their different hardware and software configurations.



BACKGROUND

Communications protocols have a history dating back to the 1960s and 1970s, when proprietary systems were commonly used. In the 1980s and 1990s, standardized protocols like SCI, CAN, and DeviceNet were developed, leading to increased interoperability. In recent years, newer protocols such as Ethernet/IP and Modbus/TCP have been developed to provide higher bandwidth and greater flexibility. This gradual evolution towards standardization, interoperability, and flexibility has been driven by the increasing sophistication of modern robotics.

REAL WORLD CONNECTIONS

Wi-Fi can be used to connect multiple robots in a network, enabling coordination and collaboration between them. For example, a team of robots working in a manufacturing facility can communicate with each other wirelessly using Wi-Fi, allowing them to share data, coordinate their movements, and work together to complete tasks more efficiently.

EXAMPLES

Some examples of communications protocols include, CAN (Controller Area Network), Ethernet, USB (Universal Serial Bus), and Bluetooth, among others. CAN is often used in industrial and automotive applications because it allows for high-speed, reliable communication over long distances, while Ethernet is commonly used in office and home environments because it provides high bandwidth and low latency. USB is often used for local communication between devices, such as between a robot arm and a gripper, while Bluetooth is commonly used for wireless communication between a robot and a remote-control device or smartphone app.