

CONCEPT Instrumentation and Controls are critical components of automation. These systems use sensors, actuators and control algorithms to regulate the behavior of robotic systems.

BACKGROUND

The history of instrumentation and controls dates back to the mid-20th century when the first industrial robots were introduced. These early robots were controlled by hardwired circuits and relays and were limited in their capabilities. In the 1970s and 1980s, the development of microprocessors and digital control systems led to the widespread use of programmable logic controllers (PLCs) in industrial automation. This enabled more sophisticated control of robotic systems and allowed them to perform a wider range of tasks. In the 1990s and 2000s, advances in sensors and machine learning algorithms enabled the development of more advanced robotics systems that could operate autonomously and adapt to changing environments. Today, instrumentation and controls play a critical role in enabling robots to perform complex tasks in manufacturing, healthcare, exploration and many other fields.

REAL WORLD CONNECTIONS

One example of instrumentation and controls in automation is the use of robotic milking systems in the dairy industry. These systems use sensors to detect when a cow enters the milking station and to monitor the milk output during the milking process. The control algorithms then adjust the milking process based on the cow's behavior and milk production.

This technology has allowed the farm to increase milk production while reducing labor costs and improving animal welfare. It also allows the farmers to monitor the health of their cows more closely and detect any issues early on. The use of instrumentation and controls in robotics has revolutionized the dairy industry around the world.

