

REAL WORLD CONNECTIONS

Nebraska-based startup, Quantified AG uses IoT sensors and AI to monitor the health and welfare of cattle. The sensors track critical data like temperature, activity, and rumination levels to identify and diagnose potential health issues before they become serious problems. This enables farmers to provide targeted treatments for individual animals, leading to better overall herd health and lower costs. Quantified Ag® is now a wholly-owned subsidiary of Intervet Inc. also known as Merck Animal Health.



BACKGROUND

In the 1960s, robots were mostly used in industrial settings and were equipped with simple sensors, such as proximity sensors, to detect obstacles in their path. As robots became more advanced and began to operate in more complex environments, the need for more sophisticated sensors became apparent. In the 1980s and 1990s, researchers began developing new types of sensors, such as vision sensors, force sensors and tactile sensors, to enable robots to perceive their environment in more detail. In the early 2000s, sensor fusion techniques were developed to combine the data from multiple sensors to improve the accuracy and reliability of the information gathered by the robot.

EXAMPLES

SENSOR SELECTION: The choice of sensors will depend on the specific requirements of the robot and the environment it operates in.

SENSOR INTEGRATION: This can include physically mounting the sensors on the robot, connecting the sensors to the robot's control system, and programming the sensors to communicate with the robot's control system.

SENSOR FUSION ALGORITHMS: This can include methods for filtering and smoothing sensor data, as well as techniques for fusing data from different types of sensors.

CALIBRATION TECHNIQUES: This can include methods for compensating for sensor noise, drift and other sources of error.

DATA PROCESSING ALGORITHMS: This can include techniques for object recognition, obstacle avoidance and path planning.

SENSOR PLACEMENT STRATEGIES: This can include methods for optimizing sensor placement based on the robot's task and the environment it operates in.