

7.3 Explanation of The Behavior of The Agent to Achieve the Goal

Data Sources:

1. **Image Data:** This comes from cameras mounted in the field, capturing real-time video footage of the crops. The AI agent analyzes these images to identify signs of disease.
2. **Sensor Data:** This includes information from environmental sensors like weather stations and soil moisture monitors. The AI agent uses this data to understand the context of the image data and make more accurate predictions.

AI Agent:

1. **Analysis Engine:** This is the brain of the system. It uses powerful algorithms like convolutional neural networks (CNNs) to analyze the image and sensor data. The CNNs are trained on a large dataset of labeled images, so they can recognize patterns and features that indicate disease.
2. **Decision Maker:** Based on the analysis, the AI agent decides whether a disease is present and, if so, what type of disease it is. It also considers the environmental data to determine the best course of action.
3. **Treatment Trigger:** If a disease is detected, the AI agent sends a signal to the actuators.

Actuators:

These are the physical components that take action to address the disease. They could include irrigation systems, drones for spraying pesticides, or other devices that can deliver targeted treatments.

Feedback Loop:

The system is not a one-way street. The actuators can send information back to the AI agent, such as how much pesticide was applied or the response of the plants to the treatment. This feedback helps the AI agent to learn and improve its accuracy over time.

Benefits:

- a) **Early detection:** The system can detect diseases early, before they have a chance to spread and cause significant damage.

- b) **Precision agriculture:** The system can target treatments to specific areas of the field, reducing the need for broad-spectrum applications and minimizing environmental impact.
- c) **Improved yields:** By preventing disease outbreaks, the system can help farmers to increase their crop yields.
- d) **Reduced labor costs:** The system can automate many tasks that are traditionally done by hand, such as scouting for disease and applying pesticides.

