

Aerial Grasping System For Precision Agriculture

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ABSTRACT

The aerial grasping system (100) integrates an unmanned aerial vehicle (UAV) (102) with at least one vision sensor (104) mounted on it, capable of detecting first and second signals. The first signals correspond to various parameters of a grasping object, while the second signals pertain to the surrounding target field. This system includes an object detector (106) linked to the UAV (102) and the vision sensor (104), responsible for producing a classification score and bounding box, identifying the grasping object based on its parameters and the target field. Additionally, it features a positioning device (108) connected to both the UAV (102) and the vision sensor (104), determining the UAV's current position using the target field data. Moreover, a control device (110) associated with the UAV (102) and the positioning device (108) generates multiple control commands, enabling efficient navigation control of the UAV (102) based on its current position.

KEY APPLICATION AREAS

1. Precision Agriculture.
2. Vertical Farming & Vertical Plantations.
3. Autonomous Crop Harvesting.
4. Agricultural Robotics & UAV Systems.
5. Smart Farming and Farm Automation.

POTENTIAL USE

1. Automated fruit harvesting in orchards and vertical farms.
2. Detection and picking of ripe fruits using AI-based vision systems.
3. UAV-based harvesting in hard-to-reach or densely planted areas.
4. GPS-denied autonomous agricultural operations using visual positioning.
5. Precision grasping and transport of agricultural produce with robotic grippers.
6. Real-time crop monitoring and harvesting assistance.