番茄采摘机器人末端执行器的硬件设计

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关键词： 番茄采摘机器人 末端执行器 多传感器 硬件 设计

摘 要： 设计的基于多传感器信息融合和开放式控制的智能型番茄采摘机器人末端执行器，其硬件主要包括执行系统、感知系统、控制系统和供电系统，执行系统中真空吸盘装置使果实从果束中分离，手指夹持机构对番茄可靠抓持，果梗切断装置利用激光对果梗进行切断。该末端执行器设计质量为1.2 kg，完成一次采摘动作只需3 s。只需更换联接板，即可与其他机械手顺利联接。 An intelligent end-effector for tomato-harvesting robot was developed based on multi-sensor information fusion and open control. The end-effector is composed of actuating system, perception system, control system and power-supply system. In actuating system, the vacuum suction pad device separates the fruit from the cluster, and then a gripper grasps the tomato fruit reliably, finally the peduncle-cutting device cuts the peduncle with laser. Design mass of this end-effector is 1.2 kg, which needs only 3 s to perform actions of harvesting. By changing a connecting plate, the end-effector can be mounted on different manipulators.

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