

番茄采摘机器人真空吸盘装置设计与试验 Design and Test of the Vacuum Suction Device for Tomato Harvesting Robot

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关键词: 番茄 采摘机器人 真空吸盘装置 设计 试验

摘要: 为实现番茄采摘机器人作业时将目标果实从果束中分离, 设计了以微型静音空气压缩机和集成式真空发生器为主体的真空吸盘装置, 并依据供气压力-负压关系、吸盘拉脱力和真空吸着响应时间测定结果, 确定了其控制策略。试验表明, 真空吸盘装置平均单次作业的时间和空气消耗量分别为1.5 s和0.6 L, 拉动果实实现35 mm水平位移的成功率达92%, 空气压缩机功率可以满足采摘效率360个/h的需要。 A vacuum suction device was developed to separate aimed tomato fruit from cluster in robotic harvesting, which took a mini air pump and a vacuum ejector as vacuum generation. Control strategy to this device was designed based on relationship between air supply pressure and vacuum pressure, pull-off force of the suction cup, and suction responding time. Experiments indicated that average time of one task and air consumption of this device were 1.5 s and 0.6 L, respectively. Success rate pulling fruit to reach horizontal 35 mm far distance was 92%. Power of the mini air pump could satisfy the need of fulfilling 360 fruits harvesting per hour.

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