禽蛋机器人的仿真与编程

摘　要

禽蛋业在如今农业中占据主要地位，是我国必须重视的产业。目前中国禽蛋业工业化全自动方面太过平庸。欧美国家科技发展处于世界领先地位，在禽蛋业领域也是科技领先的。目前外国禽蛋业已形成规模，有相对完善的自动化系统，全自动禽蛋收集，清洗，运输，分级。而我国在这方面仍处于弱势，没有大规模的养殖场，基本已小中型居多，所以很难形成机械化生产。

本设计的禽蛋机器人运输装置用于收集、存放和传送禽蛋; 视觉识别系统锁定禽蛋位置，无论禽蛋摆放方式如何都能识别定位，通过设计的吸盘，将其抓取，运输。虽然目前我国的禽蛋业年总产量位居世界第一，而在完成运输，清洗，装箱工作方面，我国仍然没有达到机械化，还需要员工手动完成。为了能赶超发达国家，我国务必在机器人领域开拓方向，早日完成禽蛋业全自动化系统。让禽蛋的运输，清洗，分级的效率提高，减少工作中的破碎率。

本文选择机械臂，在做工条件允许的情况下选择自由度多的机械臂; 确定禽蛋具体尺寸，设计真空吸盘尺寸，最后根据实际情况确认末端吸盘的数量。 需一次吸取 6 个禽蛋则需要设计 6 个吸盘之间举例，与搬运过程中是否会出现碰撞。用三维软件进行建模，用 RobotStudio 进行仿真，设计出最好的运动路线，与实际工作空间进行比较。最终选出合适的机械臂和末端执行器。

关键词:禽蛋机器人；真空吸盘；机器人视觉识别；编程；第七轴轨道；

Simulation and programming of egg robot

Abstract

Egg industry plays an important role in the national economy and is one of the pillar industries of agriculture in China. China's poultry farms are mostly small and medium-sized, unlike large-scale breeding in Europe and the United States, and the breeding is relatively scattered, and it is difficult to form a scale in a centralized way, so it is difficult to form mechanized and automated production. The designed transport device of the egg robot is used to collect, store and transport the eggs; the vibration correction device is used to make the eggs on the conveyor belt change from disorderly arrangement state to orderly arrangement state; the eggs must be cleaned, disinfected, tested and graded no matter in order to improve the export of fresh eggs or in-depth processing of eggs. At present, most enterprises in our country still use manual work to complete these tasks. There is a big gap between us and developed countries in terms of processing quality and efficiency.

In this paper, the manipulator is selected, the degree of freedom of the manipulator is determined according to the working space, and the appropriate manipulator is selected; the shape of the manipulator is designed, the specific size of the egg is determined, and the size of the vacuum suction cup is designed. If it is necessary to suck 6 eggs at a time, it is necessary to design 6 suction cups for example to check whether there will be any collision with the handling process. Modeling with three-dimensional software, simulation with robot studio, design the best motion path, and compare with the actual workspace. Finally, select the appropriate size of the manipulator and the mechanical grab head.

Key words: egg robot; machine simulation; programming

目　录

禽蛋机器人的仿真与编程 1
摘　要 1
1 引言 1
1.1 课题研究的目的和意义 1
1.2 国内外研究现状及发展趋势 1
1.2.1 禽蛋收集处理设备的国内外发展现状 1
1.2.2 机器人的发展与应用 1
2、机械臂手研究分析 2
2.1 鸡场工况分析 2
2.2 确定具体工况情况 3
2.3 确定具体机械臂手型号 4
2.3.1 产蛋介绍 4
2.3.2 禽蛋吸运分级机械手简介 5
2.3.3 禽蛋吸运机器人末端的选用 6
2.4 真空吸运装置设计 7
2.41 真空吸盘选用 7
2.4.2 真空吸盘相关参数的计算及选定 7
2.5 运输使用的硅橡胶真空吸盘的尺寸设计 8
2.5.1 吸盘的结构及气力系统设计 8
2.5.2 吸盘的结构设计 8
2.6 机器人第七轴导轨选用 11
2.6.1 第七轴导轨 11
2.6.2 导轨型号选择 11
2.6.3 导轨最终确定 11
2.7 末端执行器所需气泵的确定 12
3、视觉系统 13

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