

A SURVEY ON CONSULTATION ON DESIGN STRATEGIES OF AUTOMATIC HARVESTING

***Author 1: V.Santhi. M.Phil, M.Tech. Department of Bachelor of Computer Application.**

****Author 2: S.Kousalya.M.Sc., Computer Science.**

ABSTRACT:

The diminishing rancher and work populaces because of different components is a genuine issue that prompts increments in labour costs, higher reaping input vitality utilization furthermore, less asset usage. To take care of these issues, specialists are occupied with giving long haul and low-tech options regarding motorization and computerization of agribusiness by method for proficient, ease and simple to utilize arrangements.

This paper audits different outline methodologies in acknowledgment and picking frameworks, and also advancements in organic product gathering robots amid the previous 30 years in a few nations. The principle targets of this paper are to assemble all data on organic product collecting robots; centre around the specialized improvements up until now accomplished in picking gadgets; feature the issues still to be fathomed; and examine what's to come prospects of natural product collecting robots.

I. INTRODUCTION

Agriculture and food area unit the backbone of the many developed and beneath developing countries that helps countries to enhance their economic, social and individual standing. Agriculture is additionally one amongst the most reasons to bring humans along leading to the institution and development of human civilizations round the globe over the past ten,000 years. The sophisticated, precise and qualitative large-scale trendy agriculture business of nowadays may be a results of evolutions in time and completely different inventions in agriculture. This era of latest sophisticated and controlled environmental agriculture is producing sensible quality food, taking care to fulfil the elemental organic process needs for human health. The major changes in agriculture have occurred through domestication of crops and animals, weed management techniques, water management, fertilizer/pesticide application, genetic engineering and the large scale mechanization that ensued in the mid-1990s.

These major changes helped the agriculture sector to mature quickly with mechanization and exactness technologies by discovering unbelievable innovations and transfer on varied revolutions round the world. In recent decades, advanced technology and therefore the latest results of research are for the most part applied in agriculture so as to enhance the standard of product and to extend productivity.

The rise within the world population demands a relentless quality food provide. In Asia, decreasing farmer and agricultural labour populations because of varied factors may be a major problem, particularly in Japan [1]. As a result, to resolve this drawback, researchers are engaged in providing long term and low-tech solutions in terms of mechanization and automation of the agriculture sector by using highly subtle robots which will replace men, in tasks wherever an individual might perform worse than associate degree automatic device in terms of exactness, consistency and working cycle.

The application of automation in greenhouses is incredibly common these days; particularly, fashionable high-tech greenhouses area unit equipped with automatic machines and management systems that area unit derived versions of numerically controlled machines. Fruit harvesting is an important application in greenhouse horticulture that helps to save on labour costs and harvesting energy consumption, and to improve resource utilization [2–4].

In agriculture, some injury resistant agricultural product like olives and almonds may be harvested exploitation trunk or branch shakers [5]. However, delicate fruits, such as tomatoes, oranges, apples or strawberries, for fresh markets cannot be harvested using aggressive methods like shakers.

If these strategies were used, the fruits might be broken by being wedged by the branches of the tree throughout the autumn or by the tree directly falling on the ground, and thus fruit would lose quality and would this end in a discount of commercialism financial gain from the contemporary turn out market. Also, there's the possibility of detaching immature or tiny, immature fruits by shaking the trunk or branches of a tree [6].

Again, men are needed to gather the fruits born on the bottom once shaking, leading to raised labour and gather operation prices. On the opposite hand, the manual fruit harvesting method is highly labour intensive and inefficient in terms of both economy and time. To perform intensive manual gather, giant labour power is needed and at constant time labourwages are constantly rising.

The only thanks to maintain or cut back labour prices per unit of output is to extend productivity of labour or increase the amount of output. Competing on low labour prices is unworkable, given world trade laws and prices of living. Hence, mechanization is the only answer, since innovation with safety and security to build trust in new technologies. It offers, probably, the sole possibility for reducing gather labour expenses, in order that growers will keep competitive within the years ahead and even markets will expand [7]. Also, mechanization plays an important role in securing the long run of fruit growers in developed countries.

II. LITERATURE SURVEY:

The Digital Charter established twin aims - to create the united kingdom the safest place within the world to be on-line and to confirm the united kingdom has the world's best digital economy. The Charter aims to agree norms and rules for the web world, as a part of our work to make a thriving scheme wherever technology firms will begin and grow, and wherever voters will believe that the web may be a well ruled area. Social media platforms have brought extraordinary benefits and innovations to everyday life. They facilitate the exchange of knowledge, merchandise and services across the world and area unit necessary enablers to Great Britain economic process. Ensuring people's safety on-line may be a basic component of this thriving scheme. We need to Cyber bullying and intimidating behaviour online, which can have negative impacts on mental health and wellbeing, particularly among children, is now all too commonplace. Despite a spread of voluntary initiatives, good work by a range of charities and technological innovations, online abuse remains an issue for millions of citizens. Therefore we are taking further steps to tackle this behaviour, and ensure that offline rules apply online too.

The Internet Safety Strategy written report, that was revealed in October 2017, set out our proposals relating to tackling unacceptable behaviour and content online. Since then, the employment of the web to unfold misinformation or 'fake news', the dangers of using AI to manipulate public opinion at scale, the mass misuse of personal data and also the potential for information to be used for unethical or harmful functions, have all gained prominence as serious and real issues - demonstrating the importance of a comprehensive strategic approach to boost on-line safety and restore citizens' confidence in technology. The extent to that users witness harmful content, or experience online abuse is a significant concern. The fact that the abuse people received was often regarding political or social views is especially worrying for our democratic discourse. The survey conjointly asked respondents for his or her views on our projected policies.

The results highlighted that once asked that platforms ought to have a code of apply, just over half of respondents (197 individuals) agreed that platforms that enabled individuals to publish public messages which might be viewed by others ought to have a code.

A number of respondents also suggested that platforms which enabled live stream video content (182 individuals), creation of a dating profile (172 individuals), sending private messages to others (160 individuals), sharing images/ videos (158 individuals), creating a sharable profile to enable connections with other users (145 individuals) and sharing content such as web links with others (142 individuals) should have a code of practice;

Respondents confirmed that they'd particularly like transparency reports to cover: what moderation policies every web site had in situ and the way these ar reviewed (191 individuals); what percentage complaints have been received, however they're handled and also the volume of content removed (137 individuals); and data on however you'll get facilitate and access safety centers on their platforms (107 individuals)

II. METHODOLOGY:

Fruit harvest home robots sometimes accommodates 3 main units; the primary unit may be a recognition system during which identification and placement of fruits square measure confirmed, the second unit may be a picking system during which grasping and cutting operations square measure performed; and also the third unit may be a moving system during which programmed based mostly sub-unit of the mechanism moves within the farm or in the furrows during a harvesting operation in greenhouses.

Depending on the agricultural application and on the house throughout that the mechanism will operate, a motion joint, linear joint, twisting joint, revolving joint and orthogonal joint or a mixture of these joints square measure wont to connect the links that kind a revolute, spherical, cylindrical, rectangular or telescopic mechanism structure. The links square measure any equipped with actuators like hydraulic pumps, air cylinders, linear actuators or electric motors for output motion. Mechanical parts like gears, bearings, belts or linkages square measure wont to rework output motion from actuators. The feedback sensors like optical encoders, resolvers, thermocouples, cameras or motion detectors square measure {measure} wont to measure the assorted parameters and supply feedback to the management unit.

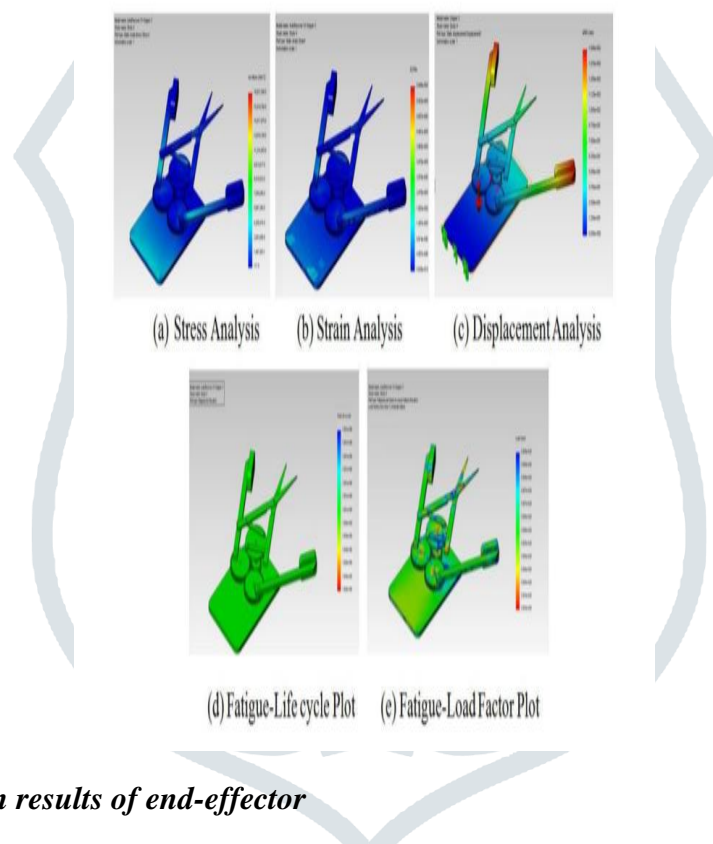


Fig.1. Prototype simulation results of end-effector

The design consists of two parallel gripper bars mounted on a frame connected by a specially designed notch plate and operated by a servo motor. Based on voltage and current, 2 differing kinds of thermal cutting system prototypes—electric arc and temperature arc— were developed. In spark, a special electrical device was developed to get high voltage to perform the cutting operation. At higher voltage, electrodes generate thermal arc that facilitate to chop the stem of sweet peppers. In temperature arc, nickel-base alloy wire was mounted between 2 electrodes and current was provided on to electrodes which ends up in generation of hot temperature arc between 2 electrodes that help to perform cutting operation.

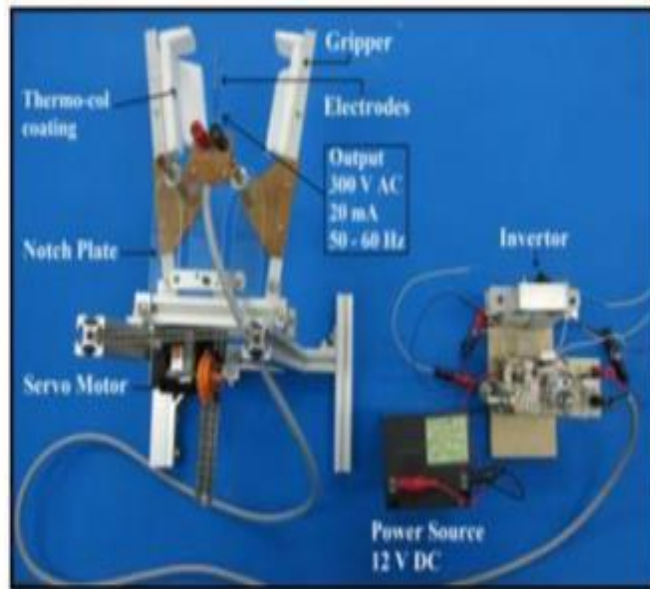


Fig.2. Thermal cutting operator

Multispectral imaging could be a technique for recognizing and characterizing physical properties of materials victimization the principle of the varied absorption (or emission) of various wavelengths of sunshine by the objects. This technique has been applied in numerous areas of science like drugs, forensics, geology, and meteorology. The wavelengths of sunshine employed in multispectral imaging typically lie among the Infrared (IR) and close to Infrared (NIR) ranges.

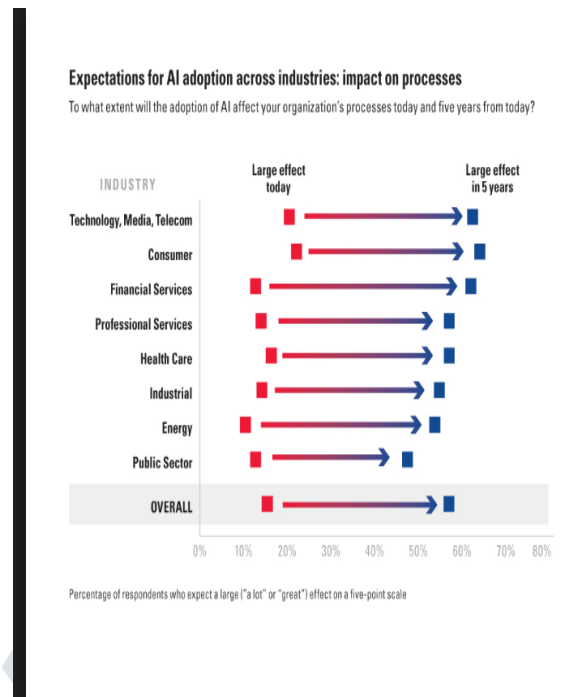
In distinction to hyperspectral imaging, that characterizes materials by measure the variation in strength over continuous ranges of wavelengths, multispectral imaging utilizes a comparatively little set of specific wavelengths. The desired wavea length is also chosen by a group of dichroic interference filters of specific wavelength and pass-band.

III. RESULT AND DISCUSSIONS:

Agriculture has transformed into the modern bio-industry it is today, something inconceivable to humans when agriculture started in traditional hunter-gatherer societies. The major changes in agriculture have occurred through domestication of mechanization, use of contemporary high-tech refined farm management techniques, adoption of innovative technologies and pushing engineering to its utmost limits for exactness farming and guarded cultivation.. The changes and developments in agriculture have been seen around the globe in terms of incredible revolutions, and various innovations and developments of machines and robots over time. The application of robots in horticultural product harvesting has also shown very significant and promising results; especially when the agriculture labour population is decreasing with an increase in labour wages and increasing harvesting energy consumption.

In agriculture, fruits and vegetables demonstrate great diversity in their properties and, due to that, researchers need to design and develop different systems for each product. Application of 1 form of mechanism designed for a selected product wasn't possible for an additional product. This drawback is common to several developments in science and technology, and there are hopes to create some multi-tasking and multi-sensory devices.

So, rather than developing separate robotic systems for every product, researchers should try to find out a universal 'one size fits all' solution. This type of labour in fact wants time, money, ample analysis and far a lot of, however this can be AN extreme engineering miracle in agriculture. For example, in recognition systems, based on feature attributes, using a single multispectral or hyperspectral vision system with intelligent image processing algorithm, detection and obtaining spatial information for several types of fruits or vegetables is possible.



Graph.1. Harvesting functions

CONCLUSION:

Decreasing farmer and labour populations because of varied factors may be a major problem that ends up in will increase parturient prices, higher harvest input energy consumption and fewer resource utilization. To solve these issues, researchers are engaged in providing long run and low-tech alternatives in terms of mechanization and automation of agriculture by manner of economical, low price and easy to use solutions. This paper reviews various design strategies in recognition and picking systems, as well as developments in fruit harvesting robots during the past 30 years in several countries. The main objectives of this paper are to assemble all info on fruit harvest robots; specialize in the technical developments to date achieved in choosing devices; highlight the issues still to be solved; and discuss the longer term prospects of fruit harvest robots.

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