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Agribot

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***Abstract* – Many advances in technology have made the agriculture business a much less labor intensive industry to be a part of. If we think back even only 50 years, farmers were just beginning to incorporate technologies into their farming techniques. It has been said that individuals that are involved in the farming industry are some of the least susceptible to change. They are very set in the ways of those came before them. When we take a look at the farming industry now, we can see that this is rapidly changing. Farmers are looking for new ways to implement technology to cut costs and reduce labor hours. One of the ways that farmers are beginning to explore new technologies in farming come from the RF agribot. This is something new to the agriculture industry, but is quickly gaining popularity from agriculture research companies around the country. These agribot are described by Farm Industry News as a agribot that drives it's solving with a computer in control. Although still in the research phase of development, RF agribot are rapidly becoming more of a reality than an idea. The agribot is controlled by a RF remote. This can be moved forward and reverse direction using DC motors. Also this robot can take sharp turnings towards left and right directions. Most of the cases the things done during farming are plough, watering and seeding. For performing all these operations lot of manpower is needed. So, by using RF agribot all these things can be done with ease.**

***Keywords* – Dual-Tree Complex Wavelet Transforms, Wavelet transform, Multi scale analysis, Gray-Level Co-Occurrence Matrix, Multilayer Perceptron Networks.**

I. INTRODUCTION

Automation or automatic control is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching in telephone networks, steering and stabilization of ships, aircraft and other applications with minimal or reduced human intervention. Some processes have been completely automated.

A Multi Tasking Industrial Robot is a deployed for many purposes. The main area of application of Pick and Place robots is designed to replace human labor. The industry is behind other complementary industries in using robots because the sort of jobs involved is not straightforward, and many repetitive tasks are not exactly the same every time.
In most cases, a lot of factors have to be considered (e.g., the size and color them to be picked) before the commencement of a task. Robots can be used for other horticultural tasks such as pruning, weeding, spraying and monitoring.

Fig: 1.1: Navigation System of the Autonomous Robot Boni Rob.

II. LITERATURE REVIEW

The aim of this chapter is to present the status of the current trends and implementation of Pick and Place robots and autonomous systems and outline the potential for future applications. Different applications of autonomous vehicles have been examined and compared with conventional systems, where three main groups of field operations have been identified to be the first

potential practical applications: crop establishment, plant care and selective harvesting.

Moreover we will give examples of the economic potential of applying autonomous robotic vehicles compared to conventional systems in different applications. The comparison was based on a systems analysis and an individual economic feasibility study for each of the applications. Focus will be put on potential labor cost savings, farm structure implications and sizes for operation, daily working hours, potential environmental impact, energy costs and safety issues.

III. DESCRIPTION OF THE PROJECT

1. Robots Designed for Agricultural

Engineers and researchers works to increase the level of autonomous machinery in agriculture and the best solution is to design and build robots capable to work continuously without human guidance. Robots deployed for agricultural purposes can deliver high accuracy and low costs while the farmers can have in real-time a situation of tasks already completed.

Fig: 3.1: Autonomous Robot Tractor.

Fig: 3.2: Solar Robot Used In Vines to Cuts Grass and Weeds.

IV. WORKING OF AGRIBOT

4.1 Material and Methods

The Agricultural Mobile Robot is designed to sensing agronomic parameters of most important Brazilian culture (maize, sugar cane, soybeans, and orange) during almost the entire cycle of growth and post harvest in large areas. It does not require actions that demand high power, as in agricultural operations, but only moving efficiently in this environment. According to MADSEN & JAKOBSEN, 2001 the considerations made about the principles of the vehicle and the choices of concept for the mobile robot were: traction, steering, dimensions, frame, motors and power supply.

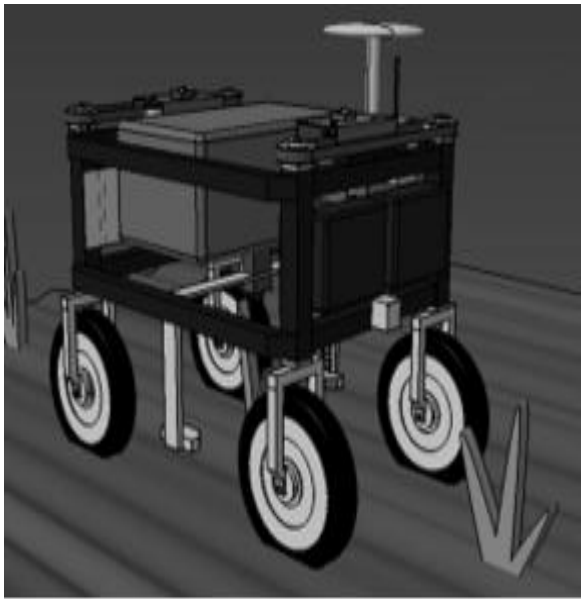

Fig. 4.1: Concept of an autonomous field robot for agricultural field trials.

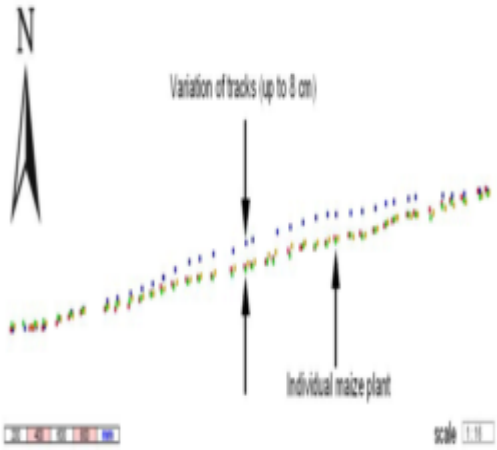

Fig. 4.2: Positions of single maize plants measured in 4 different runs.

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2. HC-03/05 Embedded Bluetooth Serial Communication Module AT command set

Fig 4.3 : AT COMMAND SET

3. HC-05 Specification:

- Bluetooth protocol: Bluetooth Specification v2.0+EDR
- Frequency: 2.4GHz ISM band
- Modulation: GFSK(Gaussian Frequency Shift Keying)
- Emission power: ≤4dBm, Class 2
- Sensitivity: ≤-84dBm at 0.1% BER
- Speed: Asynchronous: 2.1Mbps(Max) / 160 kbps, Synchronous: 1Mbps/1Mbps
- Security: Authentication and encryption
- Profiles: Bluetooth serial port
- Power supply: +3.3VDC 50mA
- Working temperature: -20 ~ +75Centigrade
- Dimension: 26.9mm x 13mm x 2.2 mm

V. DESIGN METHODLOGY OF AGRIBOT

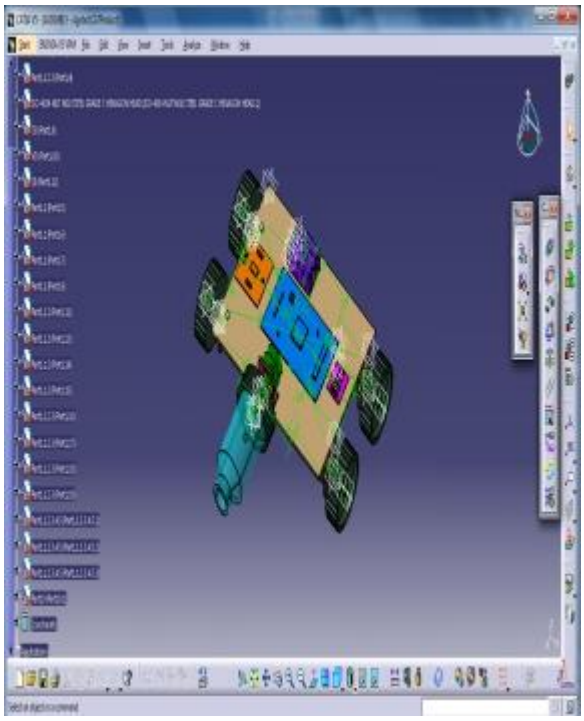

Fig: 5.1: Model design of AB in CATIA-V5.

VI. ANALYSIS OF AGRIBOT

Fig.6.1: Importing Arm file in Ansys.

VII. DISCUSSION ON ANALYSYS RESULT

1. Results of Displacement analysis:

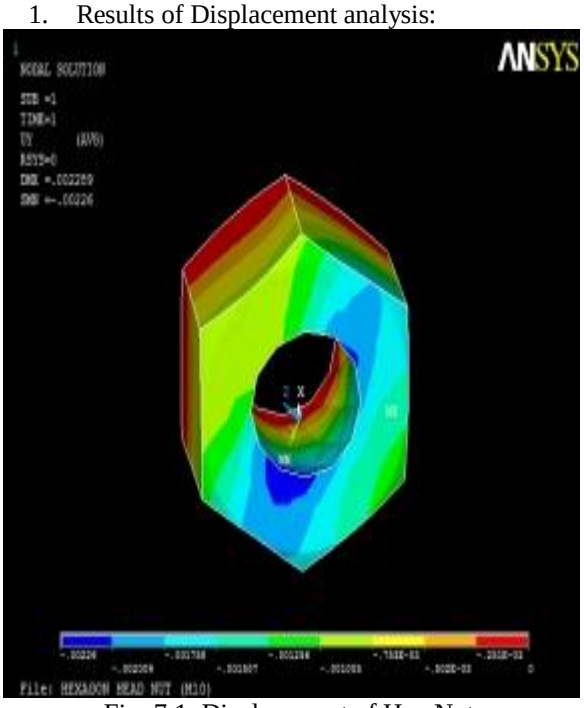

Fig: 7.1: Displacement of Hex Nut.

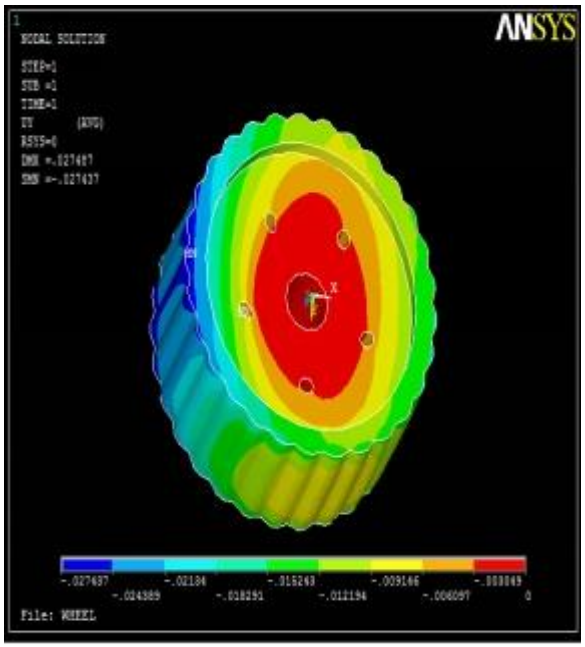

Fig: 7.2: Displacement of Wheel.

VIII. CONCLUSION

Stress is at the fixing location (Minimum Stress which is acceptable), stress value is 316.05MPa. The value which is very less compared to yield value of Aluminum & Mild steel; this is below the yield point. The maximum strain is 0.00143, this solution solving with the help of Ansys software so that the maximum stress is less .so we can conclude our design parameters are approximately correct. The development process may be incremental but the overall concept requires a shift in the way we think about mechanization for crop production that is based more on plant needs and novel ways of meeting them rather than modifying existing techniques.

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