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[Technology](#), [Development](#)



Abstract:

This paper strives to develop a robot capable of performing operations like digging the soil and seeds sowing. This paper gives the idea of E-Yantra robot which is used for digging and sowing seeds process.

E-Yantra is the robotic platform which is designed and developed by the IIT, Bombay for learning and education purpose. The main component used in the E-Yantra robot is AVR Atmega 2560 microcontroller that supervises and controls the entire process. Initially the robot digs the soil and then dispenses the seeds.

This application works on the process of Internet of Things (IOT).

At present most of the countries do not have the skilled manpower in the agriculture sector that affects the growth of the developing country.

The farmers have to upgrade their technology for digging and sowing seeds.

This process also eliminates the requirement of labor in the farm.

By using this application seeds are protected from damage and also gives high sowing rate. **Keywords:** E-yantra, IOT, Atmega 2560, digging and sowing seed.

Introduction Today India's record of progress

in agriculture over the past few decades has been quite impressive.

In these days there are various seeds sowing machines developed but there is no smartness of work done. Manual method included dispensing these seeds by hand.

In previous days digging the hole and dropping these seeds by using bullocks and tractors are done, which take various time.

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Since these processes require long time and hence a large number of human powers are required for agriculture process. If skilled human power is not available then also it may cause various problems in seed plantation. India is an agrarian economy and most of the rural populations depend on agriculture to earn their livelihood.

Agriculture is the largest livelihood provided in India mostly in the rural areas. The farmers are in need of seeds for ploughing. These seeds are available in packets manufactured by seed packets. The robotic systems play an immense role in all sections of societies, organizations and industrial units.

The innovative idea of this paper is that soil is dug and seeds are sown automatically by using e-yantra robot so that it reduces the human efforts and also reduces the cost.

The e-yantra robot is the robotic platform developed by IIT Bombay such that various applications are performed in the e-yantra module. E-

yantra module consists of three flavours: Configuration-1: Master: P89v51RD2 Slave: ATmega2560 Configuration-2: Master: ATmega2560 Slave:

ATmega8 Configuration-3: Master: LPC2148 Slave:

2xATmega8 Among which this paper works on ATmega2560 as a master configuration. Also, this paper uses the concept of Internet of Things (IOT).

The process is totally automated so that there is no need of the farmer to visit the farm for work. The one may do the work from any place in the world.

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This process is automated and does not cause pollution on the earth.

This technology is safe for all living beings and does not cause any harm.

The system is efficient and accurate to use. II. Methodology? Programming Software Atmel Studio 6.

0 Atmel Studio is the new integrated development environment from Atmel.

It provides you a modern and powerful environment for doing AVR and ARM development. Get started by exploring the included example projects.

Run your solution on a starter or evaluation kit. Program and debug your project with the included simulator, or use one of the powerful on-chip debugging and programming tools from Atmel.

Get productive with the various navigate, refactor and intelligence features in the included editor. It contains

seamless integration with various Atmel WEB services like Atmel Video Lounge, Atmel Store and data sheets to keep you updated and help you to design your solutions. With strong extension possibilities and online gallery,

it is possible for both designers and 3rd

party to provide plugins and customize the environment for best use and productivity.

Atmel Studio carries and integrates the GCC toolchain for both AVR and ARM,

Atmel Software Framework, AVR Assembler and simulator. ? E-yantra Modulee -

Yantra is the robotic platform which is designed and developed by the IIT,

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Bombay for learning and education purpose. It is the advanced robotic platform having number of functionality already built in it.

Along with that there is provision in the system that one can interface the external hardware on it for different application.?

Major Building Blocks Of Robot The Major Components needed for designing a Robot

a. Sensors: For Sensing the environments. b. Actuators: For Movement of robots and its parts. c. Control: Controller/Processor as brain of Robot.

d. Intelligence: User Written Command to perform desired set of action. Page |

3e. Power: A necessity for making a system work.

f. Communication: Robot can talk to another robot/PC. Fire Bird V

ATMEGA2560 technical specification? Microcontroller: • Atmel ATMEGA2560

as Master microcontroller (AVR architecture based Microcontroller) • Atmel

ATMEGA8 as Slave microcontroller (AVR architecture based Microcontroller)?

Sensors: • Three white line sensors (extendable to 7) • Five Sharp IR range sensor •

Eight analog IR proximity sensors • Two position encoders (extendable to four) •

Battery voltage sensing • Current Sensing (Optional) •

Five Ultrasonic Range Sensors (Optional)? Indicators: • 2x16 Characters LCD •

Buzzer and Indicator LEDs? Control: • Autonomous Control • PC as Master and

Robot as Slave in wired or wireless mode? Communication: •

USB Communication • Wired RS232 (serial) communication •

Wireless ZigBee Communication (2.4 GHz) • Wi-Fi communication (if Wi-

Fi module is installed) •

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Bluetooth communication (if Bluetooth wireless module is installed) •

Simplex infrared communication (From infrared remote to robot)? Dimensions: •

Diameter: 16cm • Height: 8.5cm • Weight: 1100gms? Power: • 9.6V Nickel

Metal Hydride (NiMH) battery pack and

external Auxiliary power from battery charger.

• On Board Battery monitoring and intelligent battery charger. Page | 4 Fig. e-yantra module III. Conclusion The main focus of this system is its Automatic way of sowing the seeds. These seeds are sown in

a proper sequence which results in proper germination of seeds.

This automatic way of sowing seeds using a robot reduces the labor requirement.

Here the wastage of seeds are also reduced to a greater extent. This system is developed for the sowing of seeds in an automatic way.

Here with the help of a robot these seeds are dispensed in the soil in a

proper sequence hereby reducing the wastage of seeds. The aim of

this project is to reduce the manpower, time and increase the sowing rate.

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