Low Cost Robot Based On AI &ML For Monitoring And Pesticides Spraying Based On Image Processing.

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Abstract

This is the age of technology and in modern farming techniques will be used for healthy farming and plantation. Till now traditional farmers have used handmade techniques and tools to spread pesticides on their crops to kill the pests infecting the agricultural land. Nowadays some farmers have started using new technologies like drones, small planes and tractors to spray pesticides on their crops, but in this procedure they waste more than required pesticides on their crops, because machines like drone, plane and tractor cover a wide area instead of focused spraying, resulting in purchased of more pesticides by the farmers, which results in financial loss for them. With the proposed agribot we are trying to achieve focused pesticide spraying, which will be more cost effective than the existing methods and it will also be integrated with machine learning for decision making purpose and solar panels as a perpetual power source.

Keywords: Precision Farming, Machine learning, Robot motion planning, Solar Panel, Digital Image Processing.

A) Introduction:

Our proposed agribot is the fast emergence of the AI and machine learning based technologies redesigned almost every industry including “smart agriculture” which moved the industry from manual to automation. Firstly we plan Agribot motion by some RobotMotion planning algorithm. Second thing is machine vision and machine learning capability with artificial intelligence for agriculture land to destroy only the pest infected crops. This Agribot is mounted by concentrated solar energy and digital camera. Machine learning algorithm will use for pest detection and spray pesticides or herbicides only on pests not the whole crops. It also controls the injection of pesticides or herbicides.

In a field of agriculture, Agribot is one such machine with the capabilities to perform efficient work which is possible with the help to design, smartly control, and to make agriculture safe and suitable for everyone. In this paper the author suggested that robot will start seeding and maintain soil moisture simultaneously [1].Farming by the traditional manual methods in use since the commercialization of agriculture. Butwith the advent of population growth rate, increasing scarcity of food agriculture should see a boom instead it has been observed that more and more people are leaving agriculture as an option for earning livelihood e intelligent within the method we have a tendency to see individuals as intelligent however should exhibit wise behaviour in recognised contexts. In this method they must have enough intelligence embedded inside them to behave reasonably for long period of your time, unattended in a semi-natural environment whilst carrying out a useful task robot in Agriculture – Agribot.

The idea of robotics agriculture (agricultural environments maintained by sensible machines) isn't a replacement one. Many engineers have developed driverless tractors within the past however they need not been prosperous as they didn't have the power embrace the complexness of the important world. Most of them assumed associate industrial form of farming wherever everything was identified beforehand and also the machines may work entirely in predefined way that – very similar to a assembly line. The approach is currently to develop smarter machines that are intelligent enough to figure in associated unidentified or semi natural surroundings. These machines don't have to be compelled to be individuals as intelligent however should exhibit wise behaviour in recognised contexts. In this way they should have enough intelligence embedded within them to behave sensibly for long period of time, unattended, in a semi-natural environment whilst carrying out a useful task. One way of understanding the complexness has been to spot what individuals waste bound things and decompose the actions into machine management. This is known as behavioural artificial intelligence and a draft technique for applying this approach to agriculture is given in Blackmore et.al. (204b).

B) Literatures reviews:

I. Motion planning

A basic problem in robotics is planning motions to solve some pre specified task, and then controlling the robot as it executes the commands necessary to achieve those actions. Here, planning means deciding on a course of action before acting. This action synthesis part of the root problem can be solved by a problem-solving. System that will achieve some stated goal, given some initial situation. A plan is, thus, a representation of a course of action for achieving a state goal.

Research on robot problem solving has led to many ideas about problem solving systems in artificial intelligence. In a typical formulation of a robot problem we have a robot that is equipped with sensors and a set of primitive actions that it can perform in some easy-to-understand world. Robot action change one state, or configuration of the world into another. In the "blocks world,"

Our aim is to design and develop intelligent and autonomous robot. We have seen how to collect the information of the environment with the help of the sensors, camera could be either the on board camera or the overhead camera. There could be multiple sensors. There could be a combination of sensors as well as camera and we collect information of the environment. Now an intelligent robot should be able to take the decision as the situation depends. So how to take the decision how can a robot take decision that we discuss.

Here we discuss about Hybrid-RRT, firstly we know about RRT. A rapid exploring random tree (RRT) is an algorithm design to efficiently search non-convex, high dimensional spaces by randomly building a space-filling tree. The tree is constructed incrementally from sample drawn randomly from the search space and is inherently biased to grow towards large unsearched areas of the problem. RRTs were developed by Steven M. Lavalle and James J. Kuffner Jr. [2].They easily handle problem with obstacles and differential Constrains (non-holonomic and kin dynamic) and have been widely used in autonomous robotic motion planning.[3].

RRT define different categories of sampling based planners, single-query planners. A tree grown incrementally from the initial to the destination configuration or vice versa. Basically they don't make roadmap like other multi-query planners (like, PRM), beside they create a tree which roots are from start location and explore the configure space by growing the tree from random samples. Once the final/goal location gets sampled, the process of exploring will be stopped. This process take several times to select the sample in the destination/goal are because of random sampling process. That's why this new RRT-Connect [4] has been proposed for to get better result of this problem. This is mainly a bidirectional version of RRT, that mines it will create trees from both stating and goal location. This feature make this

RRT-Connect make it faster planner as compare to RRT. We know from previous researches that RRT-based methods may solve these planning problems quite efficiently, and also provide non-optimal solutions. [5] the reason is, that they explore the configuration space through random walk so that their final result are a sequence of random samples, they don't have any define or proposed procedures for optimizing their trees. So they implements a rewiring operation we called it RRT* [5], it leads near optimal solution and these type of planner are know by asymptotically optimal, in simple words they will return near-optimal solutions by increasing the number of samples.

In RRT*, their features is that if the final is found they didn't stop the exploring process in configuration space. They do exploring continue. The reason is to find more better or accurate result better than current. Because of its single-query nature, RRT* continue sampling to over configuration space to optimise the current solution so that it is an inefficient way. For overcoming this problem of RRT*, there is having new method which is Informed RRT*[6]. In this we limit the search area to a subset of configuration space so to finding near optimal solutions faster compare to standard RRT*. Informed RRT& can't limit the state space into a subset before getting a solution. Before a solution being found, Informed RRT* work similarly like the RRT* do. Informed RRT* is only beingfacilitate the optimization process. But there is also having some issues for observe a sample in the destination area, if they hidden on narrow patches.

Similarly we have many more RRT and RRT* based methods are implemented to reduce their problem depending on the different issues which be getting create. [7].

Nearly all the RRT-based methods are ca be divide in different categories like optimised version (like, RRT*, Informed RRT*) been generated to retort near-optimal solutions.And non-optimization version (like, RRT, RRT-connect) been used to find inceptive solutions. Other categories of methods based on RRT methods is unidirectional and bidirectional methods.

On the one hand, unlike basic RRT, A* is an intelligent graph-search algorithm using the heuristic information and can be applied to a configuration space topologically. [8] Algorithm is being proposed by Peter Hart, et al. [9]. It may used as a fragment of the shaky project for mobile robot path planning, and also in some special case of Dijikstra algorithm.

Ayawali, rt al. [10] based on RRT a new proposed version methods, Optimised RRT-A* created. In this, some techniques used. like 1.step size based RRT, it will biases the search concerning target faster. 2. To acquire collision free path by broaden the external obstacles frontiers from morphological dilation. 3. Attaining the heuristic information by A-star algorithm will use for calculating the lowest cost-distance for neighbour nodes from each iteration to reduce the path. 4.applying the interpolation of cubic spline to make destination path smother. According to method, to avoid region of local-minima excluding providing an optimised path and abate the computational load at the time of navigating in a relatively known environment.

After that Zhang et al. [11] present basic RRT's based improved from, that took advantages of RRT span to taxing its difficulty based on using function which are, Target Bias Search Strategy(TBS). Through biasing the search towards the destination point rather search the whole space, by preconceived biasing threshold which guide the apparatus of RRT apropos the final destination, the perform the reduction of sampling space depends on potential acquire values. Using this process, create planning more precise other than the ability to deal with planning circumstances in real time. The path length and sharp edges is fixed by applying a New matric Function methodology.

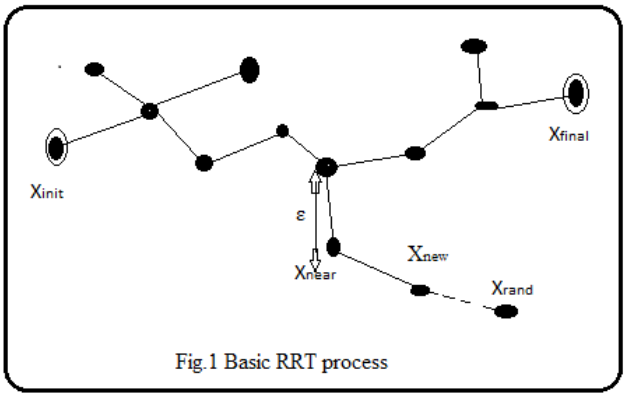

Fig.1 Basic RRT process

Lets discus some technical methods of process based on this techniques. Firstly we take RRT work process, from fig, 1 we see that how the tree has being generated through random sampling. Also after that we can see the process in Algorithm.(1) form which is like.

Input:

Initial configuration X_{init},

Number of vertices N,

Gradational lemgth ε,

Output:

RRT graph G.

G.init(X_{init})

For n = 1 to N do

X_{rand}←Rand_conf()

X_{near}←Nearest_vertex(X_{rand}, G)

X_{new}←New_conf(X_{near}, X_{rand}, ε)

G.ad_vertex(X_{new})

G.add_edge(X_{near}, X_{new})

Return G.

The extents of the ideal configuration workspace are being define excluding the obstacles region $\{W_{obs}\}$after define the initial $\{X_{init}\}$ and destination $\{X_{final}\}$ in obstacle free region $\{W_{free}\}$ are track down in the configuration space. Maximum numbers of node {N} that can be cutinizing in predefine iterations.

Now the trees start is growth by selecting a random sample $\{X_{rand}\}$. This region manages function to determine the route of the new sampling point $\{X_{new}\}$. Which are added at the time of new iteration this new points are basically used for extending the trees, the distance in $\{X_{near}\}$ and $\{X_{new}\}$ accomplish the condition of pre-obtained step-size {ε}, by edges this nodes being joined.

Basic RRT grow rapidly in large unexplored areas but for biasing toward the configuration of destination area. This Algorithm which we selected is sensitive against the obstacles, in other word the value of step-size and statistic probability has been selected carefully. Further studies are trying to find the ways to help in acquire precise values in hybrid RRT-A*, we used proposed values for step-size and statistic probability to reduce the dependence of parameters for showing the efficiency of the hybrid RRT-A*.

Here algorithm improvement are being perform, in initial phase all the previous conditions are being examine to find the goal or check the all nodes/points {N}. In every iteration, method tries to confirm the new conditions. First condition: if the $\{X_{new}\}$ new point which being added to configuration space, if doesn't skidded in a predefine which is predefine threshold then the RRT will do continues its searching. If not then Second condition: in this section, they firstly check the length {D} in between the current vertex and the last least added to the tree , this are satisfied a pre-established metric {D}or not is being check . if condition got obtain, this sub search method get recall further to continue the similar task till the final destination is being obtained, Or-else the method is aborted and the RRT are perform planner continue.

This second condition, define the A* functions. This method is being performed as local planners which explicate its environment basing on the robot sensors. In this paper we suppose or proposed this method is used as global planner where the environment is known. Sometime this planner is called also Best-First, because the configuration cells are evaluated based on less values of function f (n):

F (n) = g (n) + h (n)

Where f(n), define cost value of the concluding path which going towards the initial and final points. Similarly other two are like g (n) is for computing the path cost between initial to instant node (n), heuristic function is define by h (n), this reckon distance in between instant and final node, through expand straight line between nodes by (Manhattan, Euclidean,etc.). With the help of A* creating graph structure which save all the paths start from the initial till the destination point. This process is going continues repeating by expanding nodes that ha the minimum length cost from each iteration until getting destination point, this enables to make us decision , for which path should be extended based on reduce the f (n) value. At the end when the destination point initiate, the planner reinstate the path gradually in conflicting direction starting from destination point. Here each point keeps track of its preceding path till initial point is not being obtained. We see the whole process in the form of algorithm.(2) which like:

A* (init, final)

Close-set = {empty set}

Open-set = {append initial point}

g[init] = 0

//smallest path cost between start and current point.

f [init] = h[init]

While open-set is not empty do

Current_point← retrieve minimum f (open-set)

// it is a current point in path while using open set

if (current_point == final) then

//return finest path for every neighbor point/node N of current_point

Else if (N inside open-set),

Calculating N, g, f, h

if (g[N from open-set] > calculated g[N])

//relax (N, neighbor in open set, w)

//N parents = current_point + N neighbor to open-set

Else then calculate N, f, g, h.

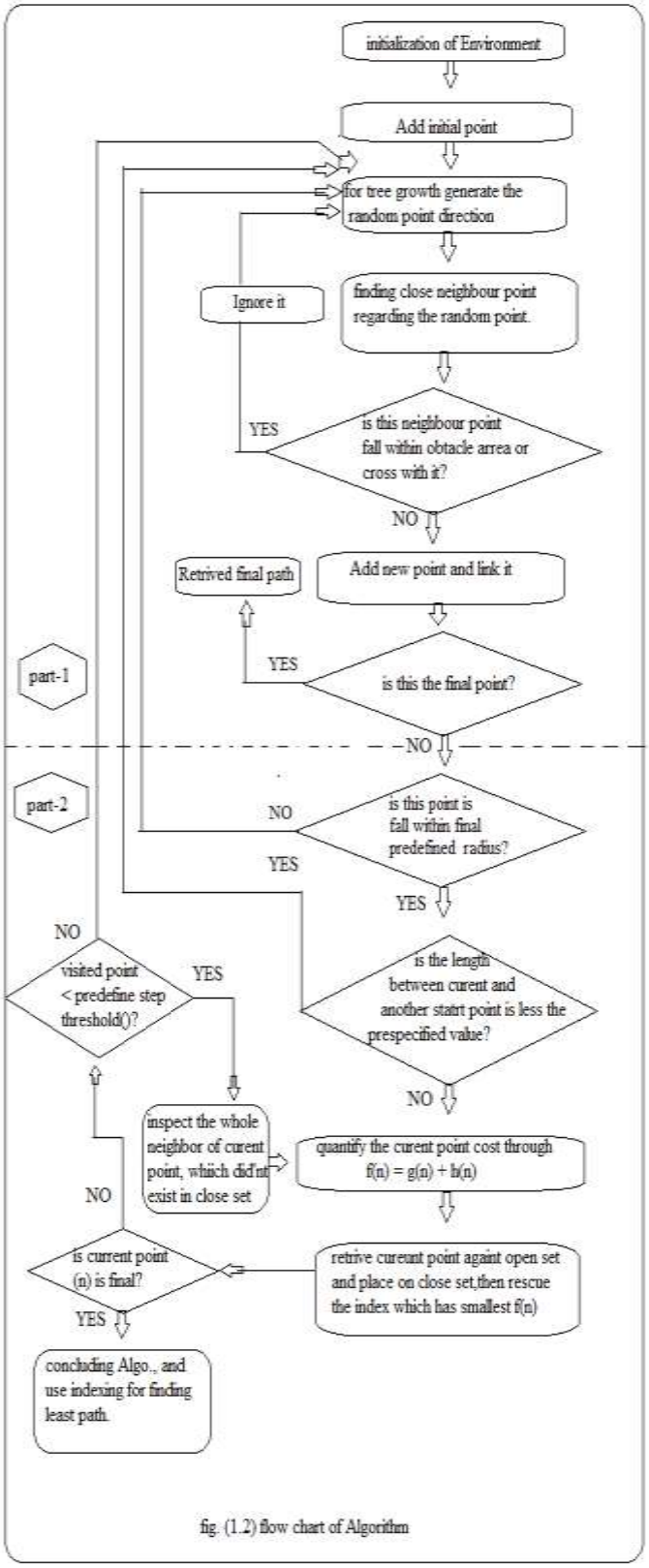

fig. (1.2) flow chart of Algorithm

This proposed method is defined by researcher; more preciously define in a following flowchart. (1.2). in this flow diagram all the process or algorithm are performing are derive for better understand that how the process are being

performed and how the algorithm is being flow step by step.

The researcher should also perform some simulation work to understand that the performance is good or not, through this computation process we finally get that result that this hybrid algorithm is quit faster than other RRT based methods it time consumption accuracy in result using method are better than other methods as compare to other RRT methods.

The reason of using these methods, because RRT will took extra time for searching and reaching the final point. So we need to overcome this drawback and also want to improve the length size and reduced searching are in with minimum time period and other factor which cannot having in basic RRT or implemented RRT also.

II. Precision Farming:

Precision farming or agriculture can be define as "the application of modern information technologies to provide, process, analyze multisource data of high spatial and temporal resolution for decision making and operations in the management of crops production, etc." (National Research Council, 1997).

This word 'precision farming' refer to managing agricultural concept depends on surveying or observation, measurement, and other variables. Perhaps the easiest way to understand precision farming is, the thinks which makes the farming more accurate and controlled. Some of the key components that are beings used in this precision farming are like information technology, elements and wide array of thinks. For example, GPS navigation, system control, some sensors, robotics technique, drones, autonomous vehicle, variable rate technologies, GPS-based soil sampling, automated hardware and software.

The primary aim of precision is for ensuring profit ability, efficiency, and sustainability while securing environment. While precision agriculture principals has been throughout more than 20yr. they have enhance the mainstream due to technical growth and the acquisition of other wide technologies. The enhancement of mobile devices, IOT based technology, low cost and dependable satellites for positioning and for other things with farms equipment which are used for optimising for precision farming. Some experts have proposed that more than 50% of today's farmer use at one farmer used at least one precision farming.

Fig. 2 areas of focus

Theirs are having some tools of precision farming, so let's just about them one by one.

1. Global positioning system:-

GPS is as set of satellites that identify the location of field equipment within a meter of an actual site in the field. The value of knowing a precision location within inches is that:

- Location of soil sample and the lab result can be compared to a soil map.
- Fertilizer and pesticides can be defined to fit soil properties and soil condition.
- One can monitor and record field data as one goes across the field.

The GPS technology provides accurate positioning system necessary for field implementation of variable rate technology. The present internet makes possible the elopement of a mechanism for effective farm management using remote sensing.

2. Geographical information system:-

A GIS consist of a computer software data base system used to input, store, retrieve, analyse and display, in map like form, spatially referenced

geographical information.

3. Grid sampling:-

Grid sampling is a method of breaking a field into blocks of about 0.5-5ha. The sampling soils within those grids to determine appropriate application rates. Several samples are taken from each grid, mixed a sent into the lab for analysis.

4. Variable rate technology:-

VRT consists of farm field equipment with the ability to precisely control the rate of application of application commonly include fertilizer, weed control, insect control, plant population and irrigation.

5. Field monitors:-

Field monitors are crop field measuring devices installed on harvesting equipment. The field data from the monitor is recorded and stored at regular interval along with positional data received from GPS unit. GIS software takes the field data and produce field map.

6. Field sensors:-

Field maps are produced by processing data from adopted combine harvester that is equipped with a GPS that is integrated with a field recording system. Field mapping involves the recording of the grain flow through the combine harvester, while recording the actual in the field at the same time.

7. Auto-guidance systems:-

This system allows farmer to maintain straight rows the next season. They allow more precise input application with these systems.

8. Proximate sensors:-

It can be used to measure soil (N and pH) and crop properties as the tractor passes over the field. The soil ample is scooped, pressed against an electrode, stabilization period of about 10-15 sec. allowed, and the reading taken.

9. Computer hardware and software:-

In order to analyses the data collected by other precision agriculture technology components and to make it available in usable formats such as maps, graph, charts, reports, etc computer support is needed.

Some more technique are also having evolve, which belong to precision farming that make the work more precise and helpful for field as well as the owner or workers.Researchers and engineers around the globe are proposing different methods and architectures and based on that suggesting a variety of equipments to monitor and fetch the information regarding crop status during different stages, considering numerous crop and field types. Focusing on the market demands, many leading manufacturing are providing a range of sensors, unmanned autonomous vehicle (UAVs), robots, communication devices and other technology they developed to deliver the sensed data. In addition, various communications, food and agriculture organizations, and government bodies are developing policies and guidelines to observe and regulate the use of these technologies in order to maintain food and environment safety.

In this paper we have try to invent the agribot with using the following researches our motive is detecting the infected leaf and monitoring the areas with modern concepts which we discuss or study, that is machine learning and image classification. This both techniques are coherent for detection purpose in many fields. Example, in a medical for major disease detection, agriculture for disease classification based on training or other applied process.

III. Machine learning , vision and AI methods:

The AI is mainly known by Artificial intelligence. This AI is firstly taught or discussed by John McCarthy in Conference held in 1956. He describes AI as a Science and engineering which are using for creating intelligent machine or intelligent computer program. These AI techniques are specifically dispensing the intelligent computation to the belonging machines so that the particular machine could learn, understand and reacting based on circumstances.

Artificial Intelligence having sub-fields of which are like, machine learning, deep learning, natural language processing, swarm inelegance & optimization, expert system, fuzzy logic, computer vision, and many others as well. To better understand we use following figure. (Fig.3)

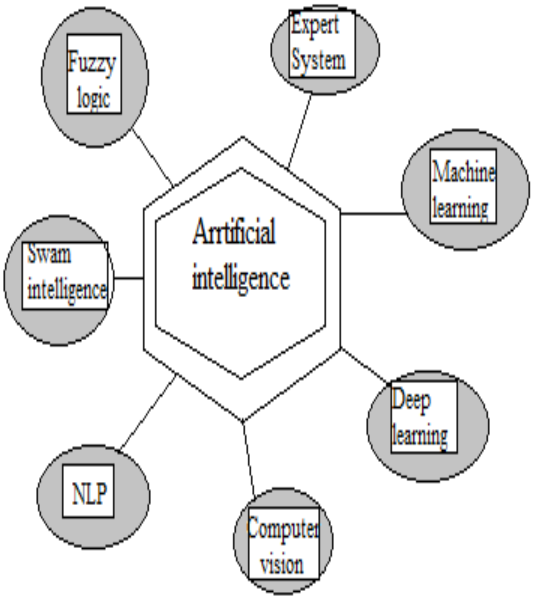

Fig.(3) Artificial intelligence Technology

Here we discuss about ML; Machine learning (Arthur Samuel, 1959) is the sub part of as we see above it is also the part of computer science, which allows computer for learning based non-programming being definite. A machine learning and extricate knowledge through data, create a structure for doing predictions. Because accessibility of ingenious algorithms and enormous data sets from internet resource, industries as well as research organizations are use this machine learning.

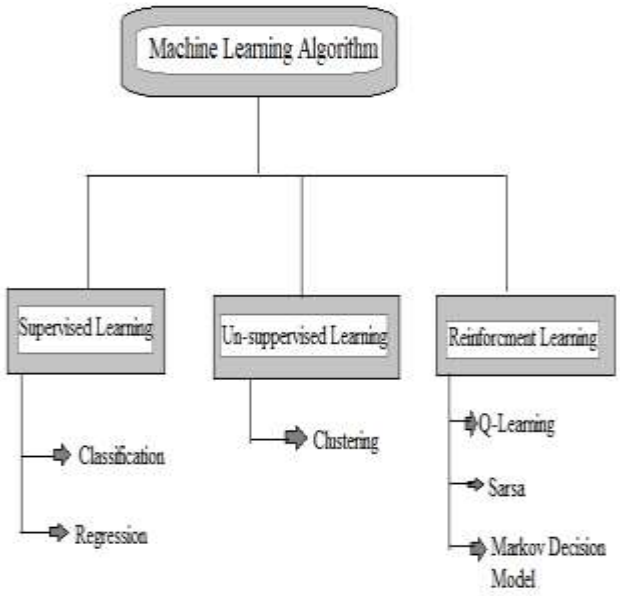

Fig.(4) ML categories

Machine learning process is been different phase: like data input, building model, and generalization. This last phase is mainly for forecasting output from getting input data's with the help of untrained algorithm. Basically this machine learning algorithms are used for resolve the complicated difficulty where the manually work is stall like, weather prophecy, spam filtering, and pattern identification, disease spotting in leaves or plants.

Machine learning is being categories in different learning techniques which are define bellow in following figure (fig.4). Here we saw that the basic types, it may also having different methods which are likes:

Regression ← a. Simple Linear Regression
b. Multiple Linear Regressions
c. Polynomial Regression
d. Logical Regression

Classification ← a. K-Nearest neighbour
b. Decision Tree
c. Random Forest
d. Support Vector machine
e. Bayes Classification

Clustering ← a. Partitioning Method
b.Hierarchical Method
c. Density based Method

Machine Learning Algorithm	Algorithm definition
Regression Algorithm	Regression algorithms are the supervised learning algorithms in which the relationship between input and output is based on the training data and it predicts the output numerical value for the unseen input. Simple and multiple linear regression, polynomial regression, and logistic regression are some of the common regression algorithms.
kNN	kNN is a simple supervised classification algorithm. In this algorithm first, the labelled dataset is divided into different classes based on their outputs. Thereafter, a new sample object is assigned a particular class based on its k-nearest neighbours.
Random Forest	Random forest is the ensemble classification model which combines a number of decision tree classifier. The final class of a new object is found out based on the majority class predicted from different decision trees classifiers.
SVM	SVM is a classification and regression algorithm that builds multi-dimensional boundaries between data points in the feature space. The output of the SVM is predicted based on the classes divided using the training data.
RNN	RNN is a feedforward artificial neural network with feedback from the output layers of neurons to the input layer. The network also consists of self-loops.
ELM	ELM are feedforward NN with single or multiple layers of neurons. It is a non-iterative approach and tuning of parameters is completed in a single run thus finds useful applications in real-time regression and classification problems.
MLP NN	MLP NN is a feedforward biologically inspired artificial neural network which has multiple layers of neurons. The synaptic weights of the network are optimized with the training dataset and later the network is used for generalization.
CNN	CNN is the most widely used deep neural network. This network consists of a number of layers of neurons in which network use mathematical operation convolution instead of matrix multiplication in at least one of the network layers.

The above table is define the some brief of the algorithms which belong to the machine learning, it have many more methods having belonging to this techniques.

IV Agricultural robot:-

Based on many researcher studies, there are having a problem of disease detection and this major issue for the farmers that how they know that which part of the leaf is affected with manually, so to getting better result an early and accurately we use image processing. There is having some references which were researcher try to make their work depend on this processing technique.

By anand H. Kulkarni et al. [12], they use Gabor filter for feature extraction and ANN dependent classifier are being used for classification, they using diverse image processing technique. Sanjay B. Dhaygude et al. [13].RGB image are being transformed into HSV (Hue Saturation Value) color space depiction and show these HSV components. P. Revathi et al. [14] they used homogenize technique like canny, sobel filters for edge recognition. For unhealthy area and categorization, Arivazhaban el al [15] proposed a texture feature. They test their algorithm on different plants, according to their study the accomplished 94.74% accuracy with the help of SVM methodology.

C. Methodology:

In this paper we will try to create an autonomous agriculture robot, which is based on precision farming and with the help of either machine vision or machine learning technology, working on disease management and precise pesticide spraying on infected part. This paper having different phases of studies. Phase-I the introduction is being define, phase-II having literature review of methods or techniques which we study in this paper, phase-III in this part we discuss the methods which we can use for creation phase-IV is final part where the discussion and the conclusion should be define.

In our proposed system we use proposed motion planning technique which we discuss in previous researchers works. So by using above discussed methods for define our proposed agribot in motion this path planning methods is based on searching and sampling of node/points of area which in define them. The purpose of this motion planning in our proposed system because this is mainly focusing on sampling based searching it also provide collision free path finding in define or unknown area as well. Region of This proposed method is using, firstly this is suitable for autonomous mobile vehicles and with this particular methods we overcome the cons of basic RRT by apply two different methods. This combination will give quite good results in simulation experiments.

We use the blend of Machine learning and computer vision, which is called by machine vision, is our proposed system we apply it for analyzing the captured image and extraction information through those images for better result. So basically we can use machine learning and image processing concepts for getting disease detection and information about infected and healthy leaf also with these concepts.

a) Design of Agribot:-

In our proposed system, we attach different component based on their working concept. Firstly we have microcontroller (Ardiuno or Raspberry-pi), multiple sensors, driving motor, spraying mechanism, and many other think are also having in it. We can communicate with this system with the help of wireless communication method.

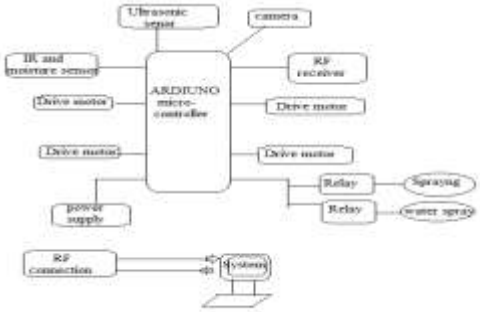

Fig (5) Basic proposed structure of Agribot

In our propped system, from figure (5) the agribot has camera which can scan the crop and live feed from a crops with the help of wireless network by some processing algorithms. For live data processing we need microprocessors. So the define algorithm is doing inspection the pest on a crop on a particular area of a crop with the aid of video processing techniques.

For improve its attribute, the obtain data is pre-processed and segmented by conquering unwanted deformation and separate noise, they segmented the component for obtain the final mage. With the help of SVM classifier, the agribot understand that the type of pest and spray fertilizer or pesticide on that area. The processes images is now supply on microcontroller, after that the components of agribot which are connected with them are doing their work such as the with the L293D chip will define the motion control board and work motor, one for wheels motion and another for pesticide spraying , water spraying. We also were using a different sensor which indicates that the amount of pesticide is having in container. If the level s below the threshold values then it will indicate and stop the spraying.

In SVM (fig.6) having following process is being performed, according to the flow chart when give input data the classifiers will perform conversion i.e. the mage is being converted into gray scale and then extracting GLCM feature through them and we perform another step which is Binarization (convert gray-scale multi tone image into Black-White two tone images), then again extracting HOG features. After that we combine both extraction feature data's. This combine data is being trained with SVM classifier and then the issue with the help of previous data. So this are process being perform for image processing and then send to the controller for performing other task with help of this new obtain data.

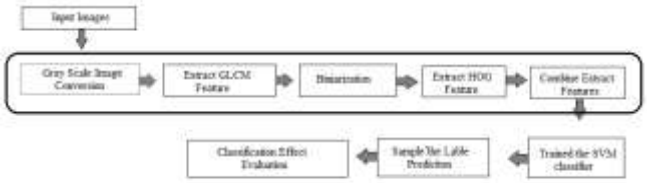

Fig (6) Flow chart for SVM classifier

Also having moisture sensors which indicate the soil moisture and according to the data the controller will response and spray desired amount of the water on the crop.

Our project very basic, we will only focus on disease detection and protect the crops by spraying mechanism. Our agribot will also based on precision farming so it will perform some more executable task based on the instruction will given from the controller and processors.

Result/Output:

In this project we have build agricultural robot which execute multiple work based on precision forming technique such as seeding, fertilizing, water and pesticide spraying, monitoring crops, etc. we try to build a proposed agribot which will reduces the extra effort or time consuming and health hazards from unwanted health issues from the manual pesticide applying methods. Our system is quit compact and easy to carry and low budget system so any one can easily afford. We believe that with the help of image processing (SVM) technique we get excellent result and more accurate prediction on disease.

Future Scope:

In future our aim is to develop an agribot which is not propped we will implement it for large yield area with some new techniques for creating automatic work and trained itself with the obtained result. We do more changes like we use real time implementation techniques for instant action taking. Also applying new precision farming technologies for adds more components. We perform some new motion planning techniques on our future system. Our main motive is to overcome difficulty of farmers in their field works on every season without any fear of quick change weather environment.

Conclusion:

In the conclusion for our whole research area is depends on the future based technologies and we will assumed that when we completed our proposed work, it will be more helpful system for the farmer so they can do their work in lesser time and long areas without going the field itself. According to previous researches we make similar system but with advance features and modules on it. That makes this agribot little bit different from the other inventions.

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