**Autonomous Tractor**

Problem statement

Labor requirements can be a big, and expensive problem, particularly in developed countries.

Harvesting can take quite a long time.

Possible labor strikes during the harvest period can be a problem for growers.

New workers may require intensive training.

Disadvantages of human power:

* Not very efficient
* Seasons and weather affect the efficiency
* Cannot work at a stretch
* Require full maintenance when there is no farm work
* Creates unhealthy and dirty atmosphere near the residence
* Cannot work in harsh conditions
* Delay in work due to atmospheric conditions

**Existing solution:**

Nothing that could be used in the farm fields. But there are a few proposed concepts but it has not been made into a practical product till date.

**Your solution**

The use of autonomous tractors is the future of agriculture. Autonomous tractors will enable farmers to fully automate their operations and therefore reducing all the disadvantages such as human labor in agriculture. The use of autonomous tractors also heralds a future for agriculture where the farmers will able to optimize their output while using very limited and less resources to achieve this, this will therefore increase productivity in agriculture.

**Preliminary work carried out**

We have built a working prototype of the autonomous vehicle which could be remotely controlled up to a distance of 1km. It can also be used for mission planning. This feature enables any autonomous vehicle to go to any designated locations that are commanded by the user to the vehicle. It also provides live feed of what the vehicle sees in front of it. It provides the essential data of the autonomous vehicle to the user in real time with the video feed.

**Merits over existing solution**

Enhancing accuracy in farming.

Autonomous tractors will be equipped with the automatic planting systems. This automatic planting systems enable the planter to determine the optimum number of seeds that can be supported by a given farm that is being planted. During planting therefore, a farmer will be able to conserve his or her seeds and avoid wastage in the process of planting. The accuracy and precision in planting will enable the farmer to optimise on his output and produce owing to the fact that the seed ratio to resources available in the soil will be optimised thus ensuring that the farmer harvests the maximum yield that can be harvested in his or her farm. The farmer will also be able to conserve his resources as wastages arising from use of excessive seeds in the farm will be avoided.

Avails reliable data to the farmer

The autonomous tractors are fitted with sensors that collect information and data on nearly all aspects related to a farm that it is operating on. Some of the data collected by the autonomous tractor relate to the soil, the fertility of the soil, the weed and pest presence in the soil among many other aspects. The analysis of these data collected by the autonomous tractor enable the farmer to make decisions that are well informed and beneficial to the farm. The introduction of the autonomous tractors and their subsequent use in the farm will therefore end the era of making decisions that are not backed up by relevant data relating to that farm.

Facilitates longer working hours in the farm

Autonomous tractors allow the farmer to work longer hours owing to the fact that exhaustion and fatigue related to farm workers who work with the normal tractors is eliminated. Owing to this, a farmer is able to map out his or her farm and control the autonomous tractors to go into the farm even at night. One of the advantages related to the use of autonomous tractors in the farm is that it reduces all the downsides related to human handling of the farm equipment.

Also, autonomous tractors enable a farmer to work even in extreme weather conditions like windy and foggy conditions that they would not have worked if the tractors were being handled by human beings.

Facilitates effective land management

The introduction of autonomous tractors into the farm will facilitate the elimination of human handling of some activities in the farm. This is advantageous to the farm managers as it allows them to fully automate some farm operations which in turn improves farm management. The autonomous tractors that have the ability of self-driving enables the farmer to do away with all the demerits related to human handling of the machines and operations, doing away with these demerits facilitates effective management of farm operations.

Availability of advanced systems and sensors for use in the farm

Autonomous tractors are fitted with high tech systems and also sensors that are primarily meant to collect data on certain aspects related to the farm. These data collected will then be analysed by the farmer to enable him or her know the state of his or her farm. The analysis of the data collected by the systems and the sensors also enable the farmer to make important decision on the planting, the crop management and also the harvesting routine of the crops in the farm.

**Work plan**

**Waiting for svt raptor**