

Team Name - ARES 007

Problem Statement - To build robots for all kinds of dedicated tasks such as cleaning shoes, planting crops, cleaning windows, etc.

Question 1 What is the problem you are trying to solve?

Answer: Nowadays, due to the very busy schedule of human beings day to day tasks such as cleaning, mopping, sweeping have become an arduous task to perform for everyone else there could be conditions where in spite of the availability of household help one could not allow domestic help in the home such as it happened during COVID times. So, to tackle this situation, we have come up with a multipurpose robot that can perform various tasks to make life easy for humans. It can be used in the surrounding where conditions do not prevail for humans.

[An expert explores how robots will affect the future of work | World Economic Forum \(weforum.org\)](https://www.weforum.org/expert/robot-future-work/)

Question 2 How does your idea address the problem?

Answer: As per the problem statement, it was started to come up with robots to perform dedicated day to day tasks to ease the workforce of mankind along with it for the betterment and fast completion of the task. Thus we have come up with the physical robot design as of now which will be able to perform the following task -

- 1) Cleaning of Window
- 2) Mopping of floor
- 3) Sweeping of floor
- 4) Objects pick and place

We as a team think that these are the basic tasks that if performed by the robot could save the time of human beings which could be used to perform other productive tasks.

Question 3 Who are the target customers?

Answer: Due to the dexterity and flexibility of the solution proposed, it has a very large pool of target groups -

1) **Individual persons** can be good potential customers because this will be a one-time solution that could replace domestic help forever owing to its own benefits which will be discussed during the elevator pitch.

2) **Government and private organizations**, it has the use case in each and everybody which comes under this category. A few examples of the task where the use of the robot can do are the following -

- A) Cleaning washrooms and keeping them fresh is pretty much a repetitive task for humans to do.
- B) There is an endless list of tasks that can be performed.

Question 4 What makes your idea unique?

Answer: The unique selling point of the solution is that currently, robots for the dedicated task are present i.e. different robots for the different task which itself come up with huge problems such as coordination of different robots etc, whereas in the solution proposed single robot will be able to handle multiple tasks, decreasing the complexity and also saving the cost of buying different robots or machines to perform different tasks.

Question 5 Do you have a revenue generation model? If so please do share.

Answer: Although there are various ways with which revenue can be generated. Few are listed below -

- 1) Subscription Model of the robots
- 2) Manufacturing and outsourcing to the organizations as per their needs

Question 6 What are geographies, do you think the idea would be suitable for?

Answer: To be honest, it would be easier to use the robot in urban households and professional organizations because its trajectory planning is based on SLAM or with the input of the map of the building where it will be deployed.

Question 7 What are the risks associated with your idea and how can you mitigate it?

Answer: The biggest threat associated with the current proposed solution is Human-Machine Interaction. There could be chances where robots could be dangerous due to their incapability of understanding things beyond their trained model.

Mitigation of the problem

The best way to mitigate this is to make a central database and make use of Reinforcement learning to train them, themselves.

Question 8 Who are the stakeholders involved in order to take bring this idea/product/service to the market?

(Ex: State govt, Department of trade and taxes, pollution control board, Manufacturers)

Answer: Stakeholders involved to take the current product to the market are -

1. Manufacturers
2. Department of Trade and Taxes
3. State govt approval

Intellectual Property Assessment**Question 9 Is your idea patentable or patented? (If so please provide details)**

Answer: Yes, our idea is very well patentable

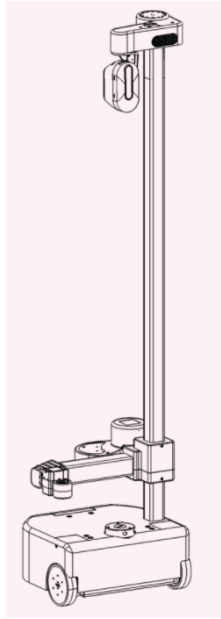


Fig. Wire Frame



Fig. CAD Model

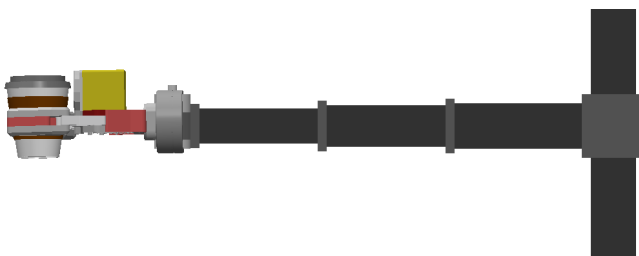


Fig. Extended ARM

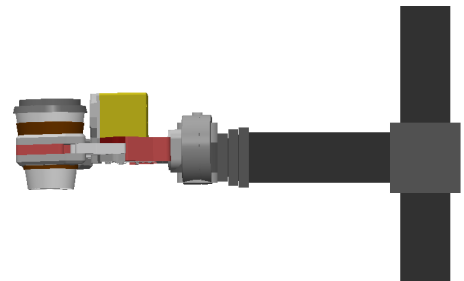


Fig. Retracted ARM

Question 10 Is your idea built on existing work? If so how is it different?]

Answer: No, our idea is very very new, although technologies do exist it is not used for these applications.

Prototype/ Proof of Concept

Question 11 What is the nature of the prototype/ proof of concept, you would be able to submit? (Ex: GitHub repository, Hardware prototype)

Answer: Proof of Concept was submitted.

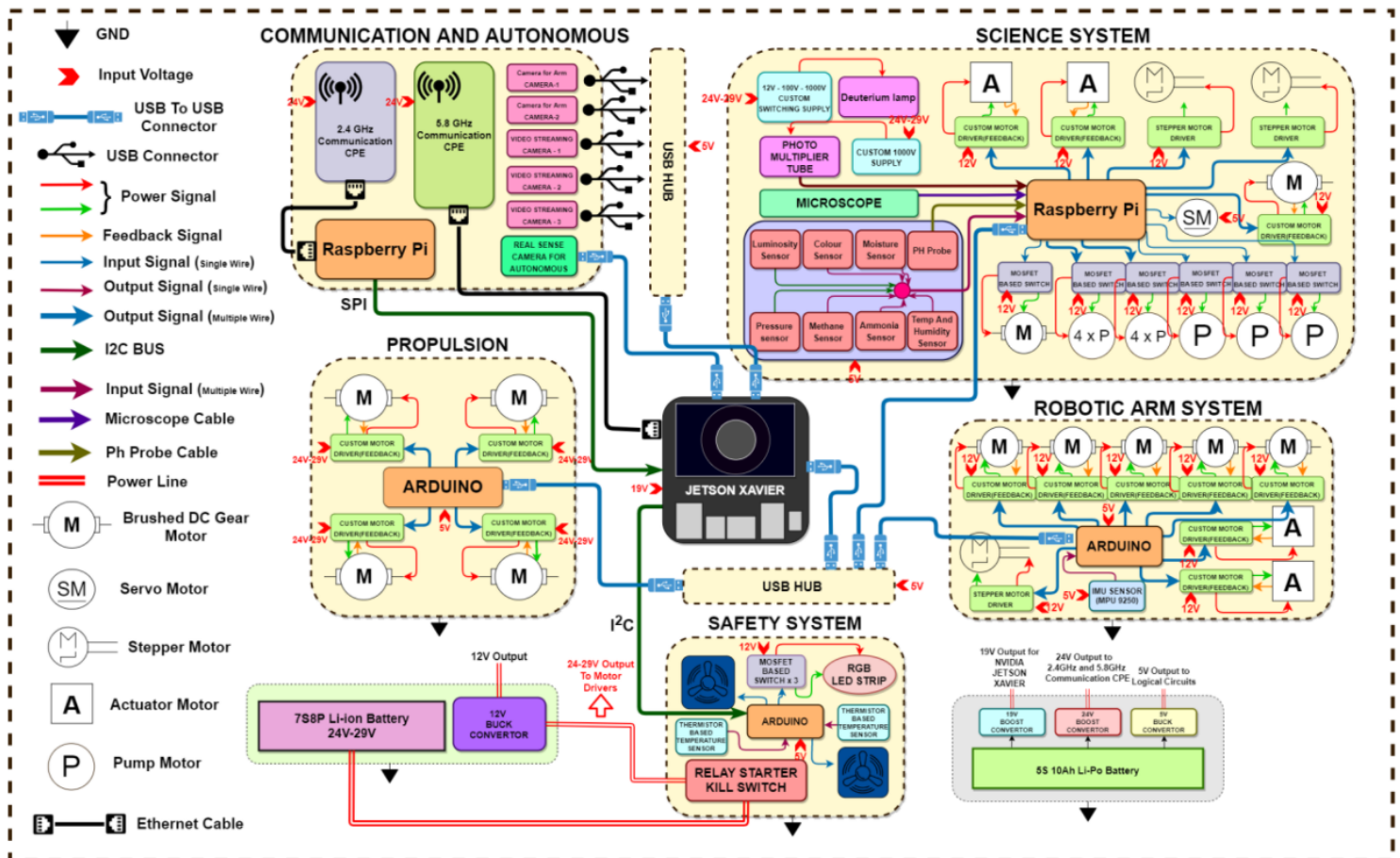
As we will be building the robot, we would be submitting the hardware prototype.

Question 12 Have you completed pilot tests for your prototype/POC? If so please share.

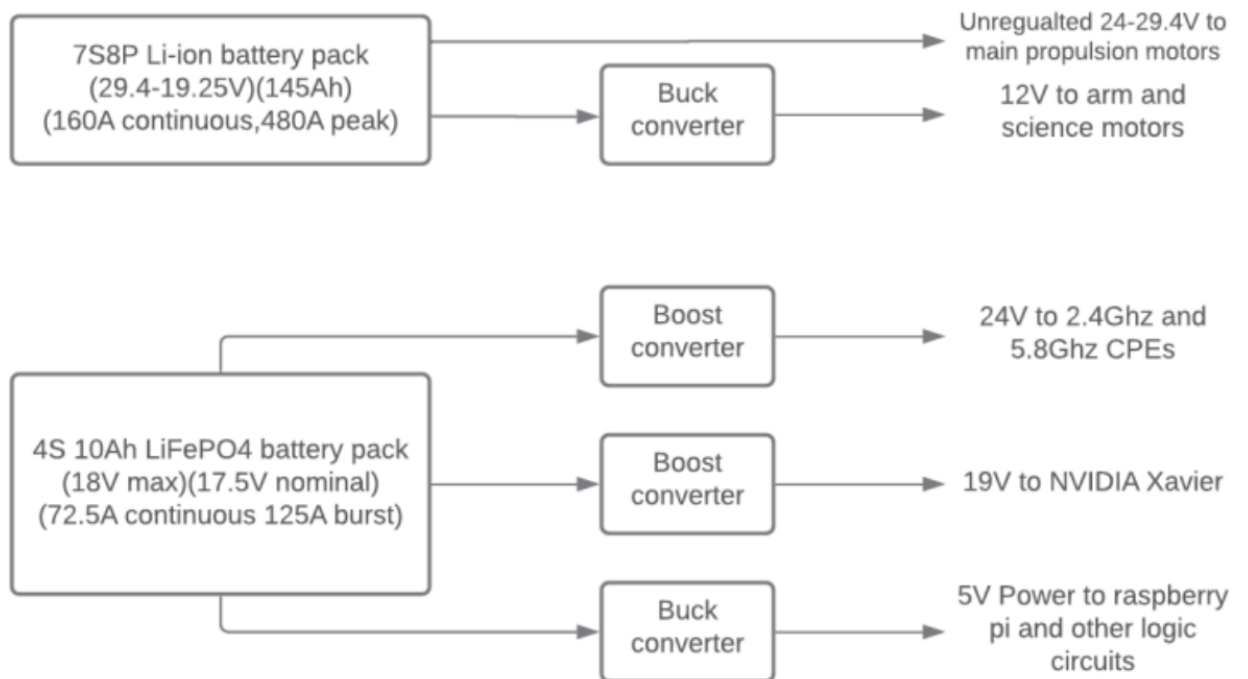
Answer: Yes, a CAD model has been made with work of embedded electronics architecture has been completed and an autonomous traversal pipeline is also completed.

Question 13 What is the approximate cost of developing the prototype?

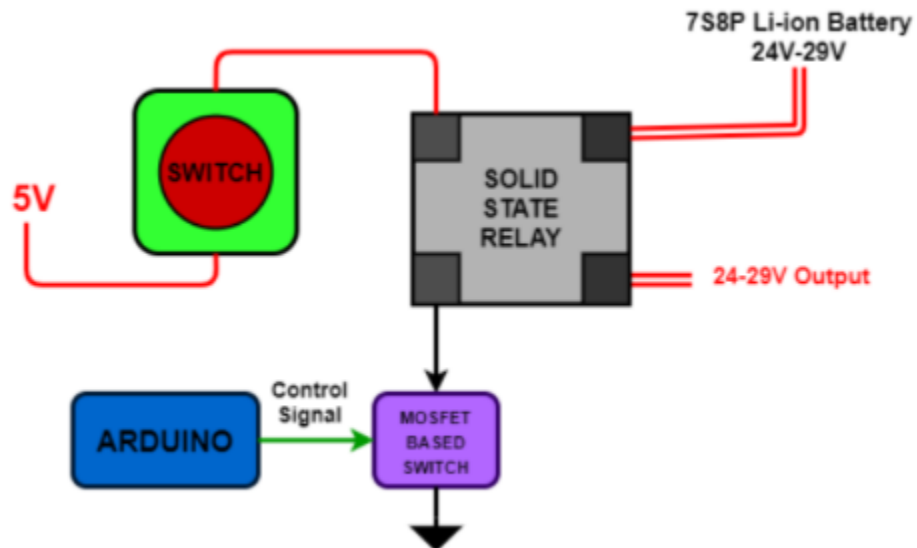
Answer: 15,000/=



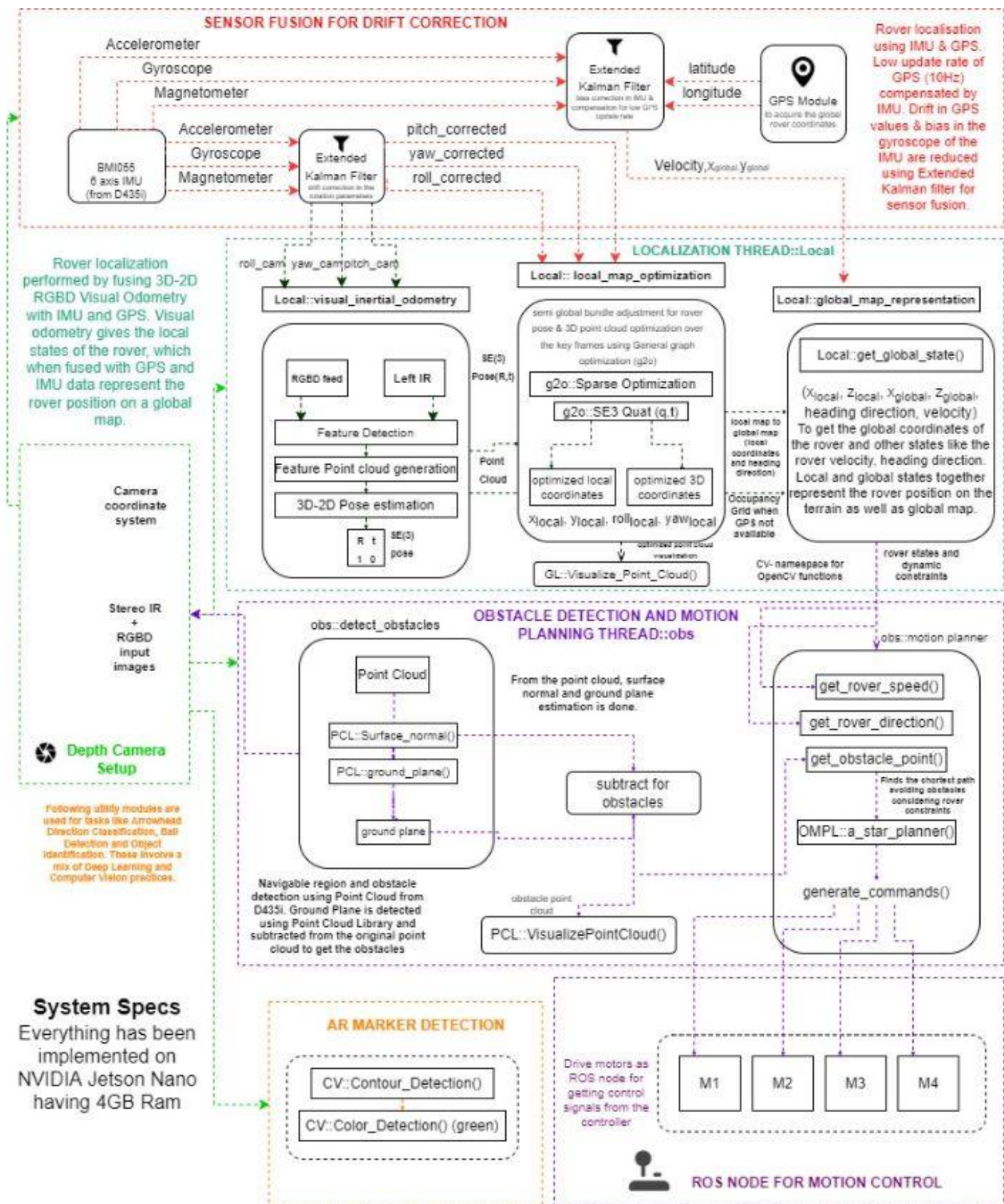
Electronics Architecture of the Multitasking robot



Power Distribution Architecture of Multitasking Robot



Kill Switch Integrated for Multitasking Robot



Autonomous Traversal Pipeline of the Multitasking Robot

Supporting details

Question: What regulatory requirements have to be met to bring the idea to life?

Answer: Yes, there are regulatory requirements that need to be kept in check such as

1. No harm to humans from the robot
2. A certain level of accuracy shall be maintained by the robot while performing the task

Question: Do you have a business plan/ commercialization strategy? If so please share.

Answer: Yes, we have a business plan for the commercialization of the product. It is very well presented in the 15 Slides PPT.

Question: What is a rough estimate of manufacturing/operational costs?

Answer: 15,000/-

Question: What is volume of products/ amount of revenue do you expect to make in the first year?

Answer: 1200 Machines for the first year
