

MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

Department of Computer Science and Engineering

Idea Proposal of IDP

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This is an application form for the approval of Idea proposal of IDP by the Course Teachers. All the criteria which are applicable from the following list must be mentioned and filled in properly.

Date: 05/08/19

1. **Group No:** 01

2. **Section:** A

Session: 2016-17

3. **Program:** CSE-17

4. **Tentative Title:** Autonomous Cleaning Robot Inspired by iRobot Roomba-860

5. Background and Present State of the Problem:

The concept of cleaning robot first evolved in the year 2002. In the cleaning robot Roomba-860, it features remote-controller using simple IR mechanism and keeps track of the path using proximity sensors. Without usage of smart path detection, it becomes unable to operate for longer periods. Also it doesn't feature any time scheduling mechanisms. And can't auto-charge itself. [1]

6. Objectives with Specific Aims and Possible Outcome:

Objectives & Outcomes :

- Making an AI robot which have endless utility features in human life
- Use of IOT to make our life more dynamic
- Except for cleaning , the features included in the robot also feasible for combat robots useful for military people , such as return to it's base if the controller lost control .

7. Outline of Methodology/Experimental Design:

Cleaning mechanism: Two motors having opposite rotation with specific blade configuration for cleaning and one brushless motor for suction of small dirt particles.

Sensors: IR, SONAR (proximity sensor), LIDAR(depth sensor), OPTICAL SENSOR (path detection) will be used for processing data on its way.

Algorithm and AI: algorithm and AI helps to choose the optimal path and also avoids collision from different objects.

CPU: Arduino mcu / Raspberry Pi will be used for all the data processing.

8. Please select the covered domain of your project (At least 04 or you can add any other domain(s) that is not included in the following list)

<input checked="" type="checkbox"/> Theoretical CS and Algorithms <input type="checkbox"/> Networking <input type="checkbox"/> Database and Data Mining <input type="checkbox"/> Cloud Computing and Big Data <input checked="" type="checkbox"/> AI and Robotics <input checked="" type="checkbox"/> Digital Image processing	<input type="checkbox"/> Information Security <input type="checkbox"/> Computer Vision <input type="checkbox"/> Pattern Recognition <input checked="" type="checkbox"/> Internet of Things (IoT) <input checked="" type="checkbox"/> Human Computer Interactions (HCI)
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9. References:

- 1) [Smart floor cleaning robot-Semantics Scholar:-
https://pdfs.semanticscholar.org/1620/c434739129c45333dc5e5669500ca28b8f16.pdf](https://pdfs.semanticscholar.org/1620/c434739129c45333dc5e5669500ca28b8f16.pdf)
- 2) <https://en.wikipedia.org/wiki/Roomba>

10. Cost Estimate: (Breakdown can be provided in separate sheet if necessary)

Ser No	Items	Cost (Taka)
1	Cost of Equipment (sensors+processor unit mentioned earlier)	15000
2	Field works (if applicable)	5000
3	Conveyance / Data Collection (with breakdown)	
4	Typing, Drafting, Binding and Paper etc.	1000
Total Amount		21000

11. Market Analysis: (Following is the market analysis with other existing project)

Existing Projects Vs. Our Project	IR remote control (for operation control)	GUI(user interface via android/p c platform)	IOT(Remote access compatibility through internet)	AI(detection of the docking station for auto charging)	Algorithm(Finds Optimal path & object detection)	Time Schedule(schedule the time of activation according to User need)	Floor Mapping(Map the floor according to user specification)	Voice recognition(allows voice controller)
Irobot Roomba-400 series								
Irobot Roomba-600 series								
Irobot Roomba-800 series								
Xiaomi MI Smart robot vacuum cleaner								
Our Project								

Signature of the group members:

Serial No	Student ID	Name	Email	Signature
1.	201714015	Akib Zaman		
2.	201714029	Wazed Rifat		
3.	201714033	Mustaqim Abrar		
4.	201714039	Tasfik Rahman		
5.	201714049	Rahul Mohoto	Rahulmohoto@gmail.com	
6.	201714065	Zobair Hasan		

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Signature of the Course Teachers

