**Floor Cleaning Robot**

**Developers**

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***A picture containing clipart

Description automatically generated***

# Introduction:

This project helps to keep your house clean. The floor cleaning robots automatically does the work of cleaning your house floor daily.

# Modules:

## Ultrasonic sensor:

This helps the robot to traverse on the floor. It tries to detect obtacles on its way and changes path based on the obstacles.

## Lux sensor:

This helps to detect the time when everyone in the house has slept. If there is no light in the house and also if it is night time, the robot automatically switches on and cleans your house floor

## Water level sensor:

The robot has a small water tank for cleaning the floor using water. The robot stops functioning if the water level is below the lower limit.

## Actuators:

## Wheels:

The robot has two wheels which runs based on the input from the ultrasonic sensor

## Water valve:

The water valve is activated based on the water level in the tank

# Software Architecture Diagram:

IPC

Threads on BB

Actuator threads

Sensor threads

Sockets

Lux sensor

Water level sensor

Ultrasonic

Logger

Alert system

12V valve

Motors

Tiva – remote node

BB

Controller node

Message queue

UART

Heartbeat

BIST

Wheels

# Requirements and Product Capabilities:

* The Floor cleaning robot cleans the entire floor. It uses ultrasonic sensor to traverse the floor by detecting obstacles and rerouting its path.
* Also, the robot has a water tank which sprinkles water for cleaning purpose. The water valve is opened when there is sufficient water.
* The robot switches on automatically during night time (using the lux sensor) and cleans the entire house.

Closed loop control

* Obstacle detection
* The ultrasonic sensor detects any obstacle on the remote node and sends it to the control node. The control node give signals to the remote node to navigate without hitting the obstacles
* Water valve control
  + Based on the water level in the tank, the remote node sends data to the control node. The control node gives pulse to open or close the valve based on the water level
* Auto start up
  + Lux sensor measures the lightness level and sends to the control node. The control node gives signal to boot if the lux is very low(night time)- this is the auto start of the robot

Key Learning:

Steve:

* This helped me to learn the real understanding of locks. I learned what would be the issues if there were no locks
* Learned how to create a graphic user interface
* Learned how to interact between python code and C code and the issue that would arise
* Learnt how to interact between or active a task in the application based on a sms

Sanju:

* Integration testing should be done as and when new features are added as it becomes really difficult to deb
* ug faults later on.
* Learned to use interact between different programming environments using sockets.
* Learned how to properly use locks in design.
* Learned how to communicate between devices using the UART.