**DTTO: MODULAR ROBOTS**

**OBJECTIVE:**

To build a Self-reconfigurable autonomous robot which can deliberately change shape by reorganizing connectivity between the modules.

To add sensors to the robot and make it smart. (To sense and take action according to the environment)

**DELIVERABLES:**

A stable modular robot which is able to change its shape upon the need of the environment

Code and Documentation of each Task (1-6)

**TASKS ACCOMPLISHED**

* Task-1: Got Familiar with existing models, selected the most suitable model based on efficiency, expandability and time constraints.
* Task-2: Interfaced Arduino Nano with Servo Motors, Bluetooth and Sensor.

- Task-3: Testing and selecting appropriate sensors to add in the module.

Two Sensors were successfully interfaced and calibrated:

1) Sharp Sensor

2) Laser TOF Sensor (selected based on size, range and accuracy)

- Task-4: Studied the design and made design changes to module to change the hole size as to fit the available screw dimension.

-Task-5: Simulated the movements of the designed modular robot.

Interfaced Laser TOF sensor in simulation environment and took feedback for reorganization. Also scripted it in LUA to overcome obstacles. (Attached video)

After successful simulation of the design the parts are given for printing.

**IMAGES AND VIDEO**

Add interfacing images of Bluetooth, Sensors with Arduino Nano

Add Simulation Video showing obstacle avoidance

**CHALLENGES FACED**

Appropriate screw (2mmx4mm Flathead) not available, so had to change the 3D CAD design

Selection of Sensors which would fit the free space available in the design, and also serve the purpose successful obstacle detection.

Coding on V-REP using LUA. The V-REP script flow is time dependent. (Add flow diagram)

**DELIVERABLES IN THE NEXT PROGRESS PRESENTATION**

1) All printed parts assembled. Four Robotic modules to be assembled

2) Appling algorithm to check different type of motion (Wheel, Snake)

3) BEGIN Autonomous obstacle avoidance using sensor detection.