GE107 - Tinkering Lab

PROGRESS REPORT

PROJECT TITLE : GESTURE CONTROLLED ROBOTIC CAR

GROUP - 14_Wed

TEAM MEMBERS -

HARSH SHARMA

HARSH SHAH

BARINDER SINGH

SUYOG BEWLE

AYUSH KUMAR

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PROJECT OVERVIEW

Objective -

We’re working on building a gesture-controlled robotic car using an accelerometer to translate hand movements into directional commands. The goal is to create a smooth, intuitive control experience — and while we’re not there *yet*, we’ve laid a solid technical foundation.

Tools / Components -

- **MPU6050 Accelerometer –** For detecting hand gestures through tilt and motion.
- **Arduino Uno –** Acts as the brain of both transmitter (glove) and receiver (car).
- **Motor Driver Module (L298N) –** Controls DC motors based on input commands.
- **DC Gear Motors –** Used for car movement and direction control.
- **Chassis Kit –** Basic 2/4-wheel car platform with caster support.
- **RF Module (nRF24L01 / HC-12) –** Wireless communication between glove and car.
- **Battery Pack (Li-ion / 9V) –** Portable power for both controller and car.

PROGRESS SUMMARY

Gesture Input System (In Progress)

- Accelerometer (MPU6050) connected and responding to motion.
- Currently mapping hand gestures (tilts) to basic directional signals.
- Still testing for stability and responsiveness in gesture detection.

Microcontroller Setup

- Arduino Uno is up and running.
- Reading live accelerometer data through I2C.
- Beginning to write logic for gesture interpretation and command generation.

Communication Module

- Started setting up wireless communication using [RF/nRF24L01/HC-12 – choose your module].
- Basic transmission between transmitter and receiver tested, but still tuning range and reliability.

Chassis & Motors

- Car chassis assembled with motor driver connected.
- Power system under testing (trying out different battery packs for efficiency).
- Motors are responding to direct commands, but integration with gesture system is pending.

TEAM CONTRIBUTIONS

1. HARSH SHARMA – Hardware Integration Lead

- Connected accelerometer, motor driver, and power systems.
- Assembled the car chassis and ensured stable wiring.

2. HARSH SHAH – Code & Microcontroller Logic

- Wrote Arduino code to read accelerometer data and interpret gestures.
- Handled motor control logic and PWM tuning.

3. BARINDER SINGH – Wireless Communication

- Set up and tested RF modules for data transmission.
- Debugged issues related to range and signal stability.

4. SUYOG BEWLE – Gesture Mapping & Sensor Tuning

- Calibrated MPU6050 for accurate gesture detection.
- Defined tilt thresholds and optimized response time.

5. AYUSH KUMAR – Power Management & Testing

- Managed battery configurations and voltage regulation.
- Ran tests for runtime efficiency and system performance.

6. KAPISH MINA – Documentation & Presentation

- Prepared progress reports, application summaries, and diagrams.
- Coordinated presentation flow and visual content creation.

FURTHER STEPS

Our work is still in progress and for the next week, we have the following plan -

- Finalize gesture-command mapping (forward, reverse, left, right).
- Fully integrate wireless control between glove and car.
- Begin controlled testing of movement based on hand gestures.
- Design a basic prototype glove for easier handling and stability.

THANK YOU !