# Remote-Control Target-Tracking Tank

Project

The Remote-Control Target-Tracking Tank (RC-TTT) is an interactive system designed around two Remote-Control (RC) vehicles that have the unique feature of an automatic target-tracking foam dart turret

The RC-TTT was designed with three main objectives:
- Develop an RC system that has the unique feature of an automatic target-tracking system
- Design two RC vehicles that function as a system to emphasize an interactive playing experience
- Design a foam turret that automatically rotates based on target-tracking infrared light data

System
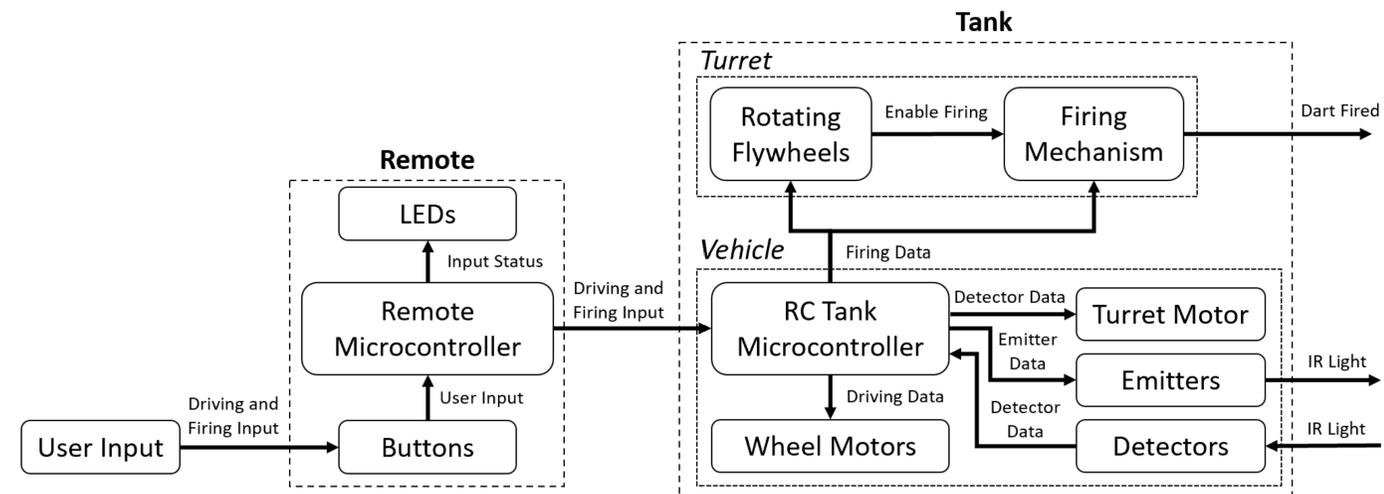
Methods

The design of the RC-TTT was divided into three main modules:
- **Remote**
  - Provides a user interface to wirelessly control the RC-TTT vehicle and turret
  - Uses four buttons to drive the vehicle and two buttons to fire the foam dart turret
- **Vehicle**
  - Uses an ESP-32 microcontroller to control all vehicle and turret functionalities
  - The vehicle has a 3-D printed chassis for housing the RC-TTT's components
  - Uses infrared light detectors to track IR emitters mounted on other RC-TTT vehicles for automatic aiming of the foam dart turret
- **Turret**
  - The turret is fired by using a servo motor-controlled rack and pinion to push foam darts from the magazine into two rotating flywheels

Conclusion

- **Results:**
  - Successful vehicle and turret control via a wireless remote connection
  - Successful driving and firing control based on user input
  - Automatic target-tracking foam dart turret based on infrared light detection data

- **Future Improvements:**
  - Higher powered infrared light emitters for greater infrared detection range
  - Updated chassis design for better access to vehicle's microcontroller and battery
  - Different PCB design to allow for more GPIO pins to be used as IR detectors which would allow for more precise target-tracking

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