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PROJECT DESCRIPTION:

Our project is a remote controlled tank with a mini turret that fires a laser. The tank uses wireless transmission to talk to the controls, communicating to the Arduino connected with the joysticks. For

our tank, the two tracks move independently, each track is controlled by a joystick. The tank has 2 modes, one for driving and one for turret control. When in turret mode, the joysticks now control the orientation of the laser. The modes can be toggled by pressing one joystick, the other joystick controls the firing of the laser.



Remote Control

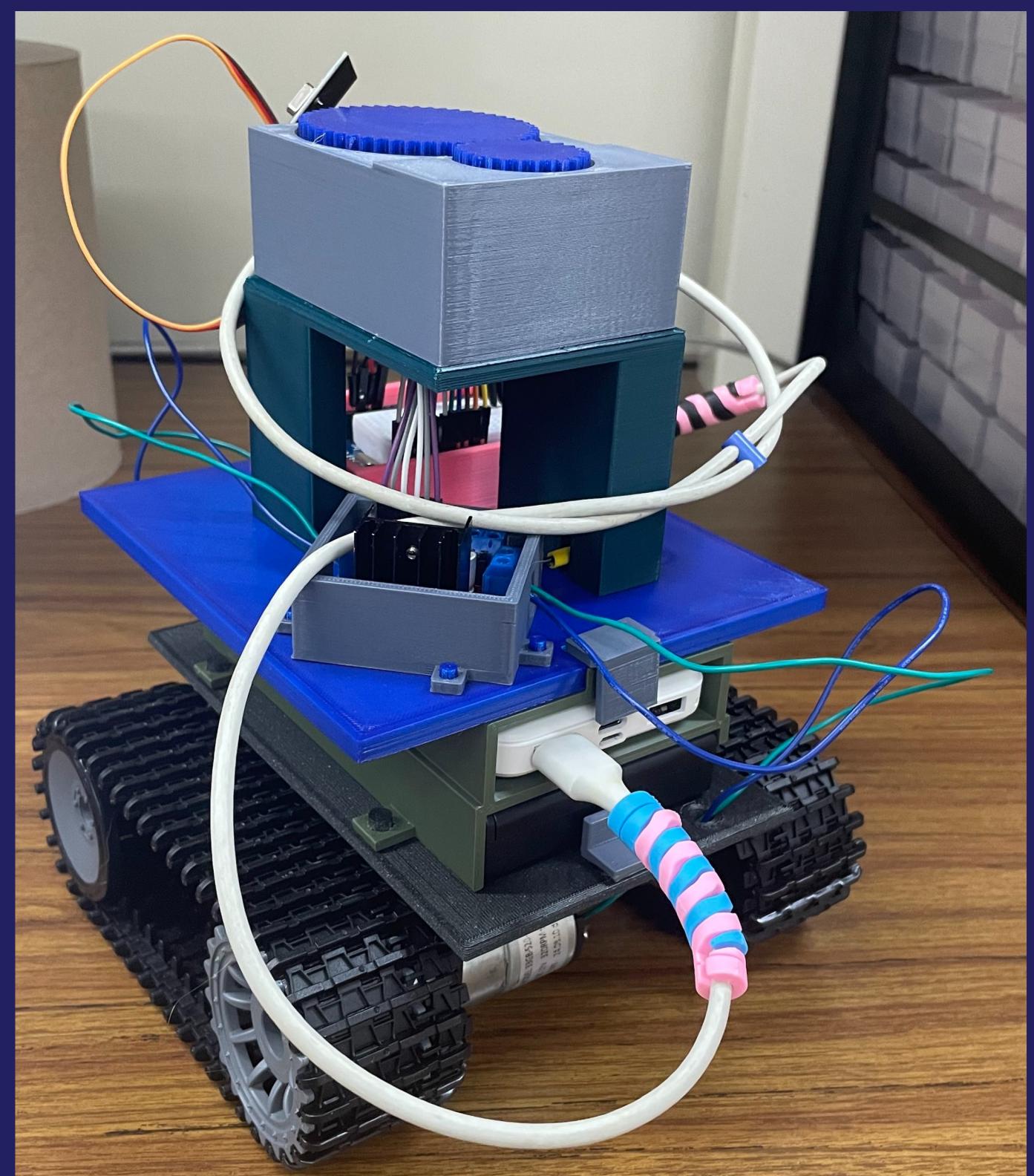
Hardware Components:

- Chassis
- 2x servo
- 2x DC motors
- Various 3D printed parts

Circuit Components:

- 2x Arduino Uno r3
- 2x Joysticks
- 2x Mini Breadboards
- L298n H-bridge controller
- 2x nrF24l01+ boards
- 5mW laser diode

We would like to thank Northrop Grumman for providing the Arduino Kit we used in the controller of this project. We would also like to thank the UCSB ECE department for making this class possible, and we would like to thank all of the TA's and Professor Hespanha for their help with our project.



Tank

PROCESS:

- Assembled chassis and wired initial prototypes of the motor and joysticks
- Implemented and tested wireless communication with two Arduinos
- Wrote software allowing communications between nRF transceivers and the other components of the tank
- Designed parts for the turret and wrote software to control the turret
- Designed and printed various 3D parts to hold the tank together

CHALLENGES:

- The nut holding the wheel in place unscrewed itself whenever the wheels turned - fixed by screwing 2 nuts together.
- The circuits and wires on the tank getting caught in the tracks - fixed by 3D printing custom parts to keep everything in place.
- Getting the nRF24l01 transceivers to communicate with each other - fixed by took code from online and extensively debugged
- Getting the turret to work alongside with the tracks - fixed by separating the controls of both into 2 different modes, one turret mode and one driving mode.