Robotics Project 1
Sensing and Movement

Group 6:
Tao Zheng, Adam Barnett &
Chris Madole

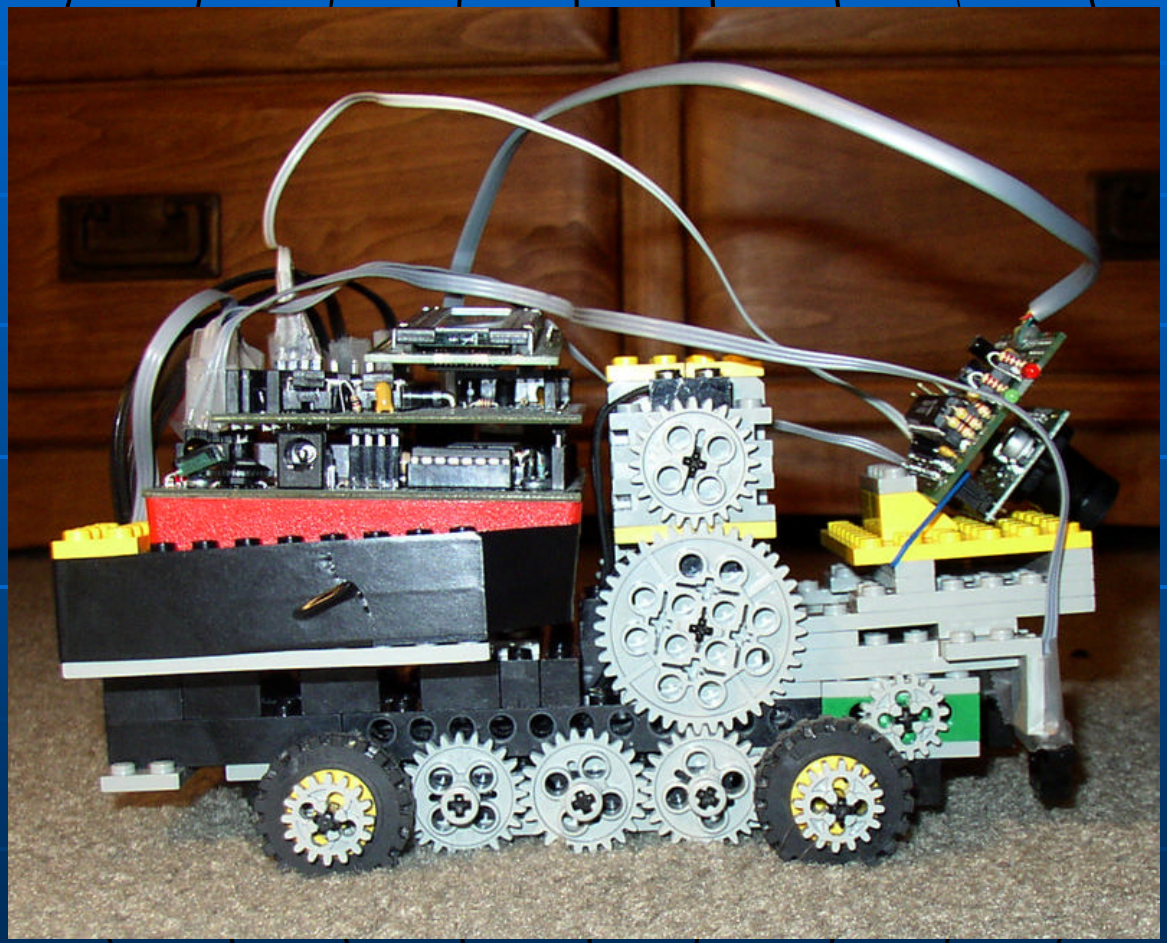
Overview

- Introduction
- Robot Design
- Robot Code
- Team Organization
- Questions

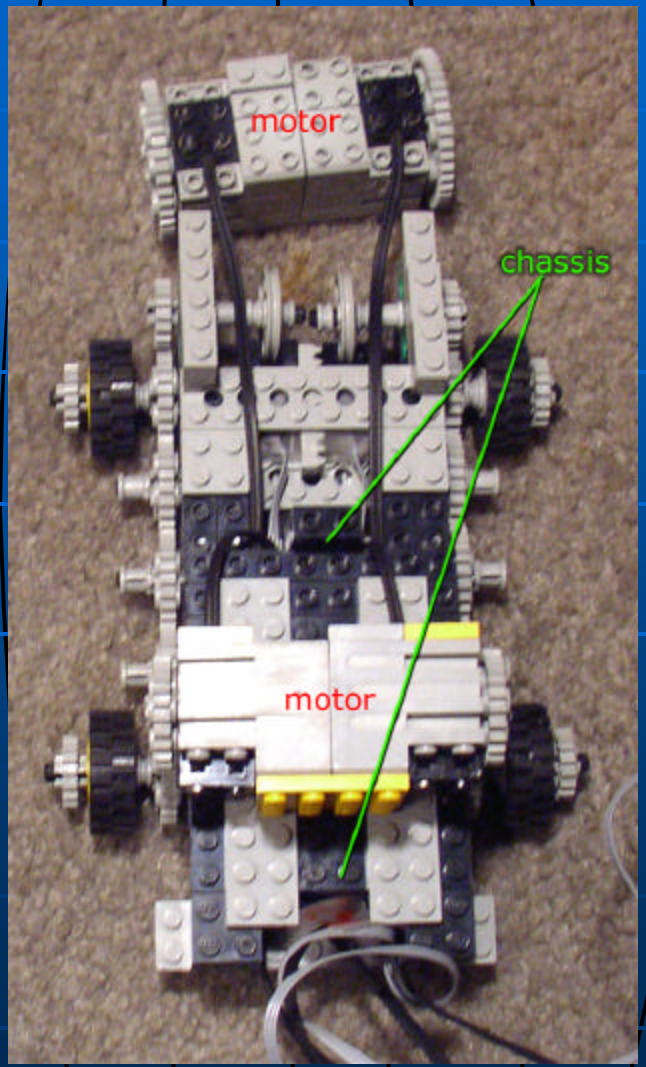
Robot Design

- Body
- Suspension
- Gearing
- Motor Mount
- Sensor Mount

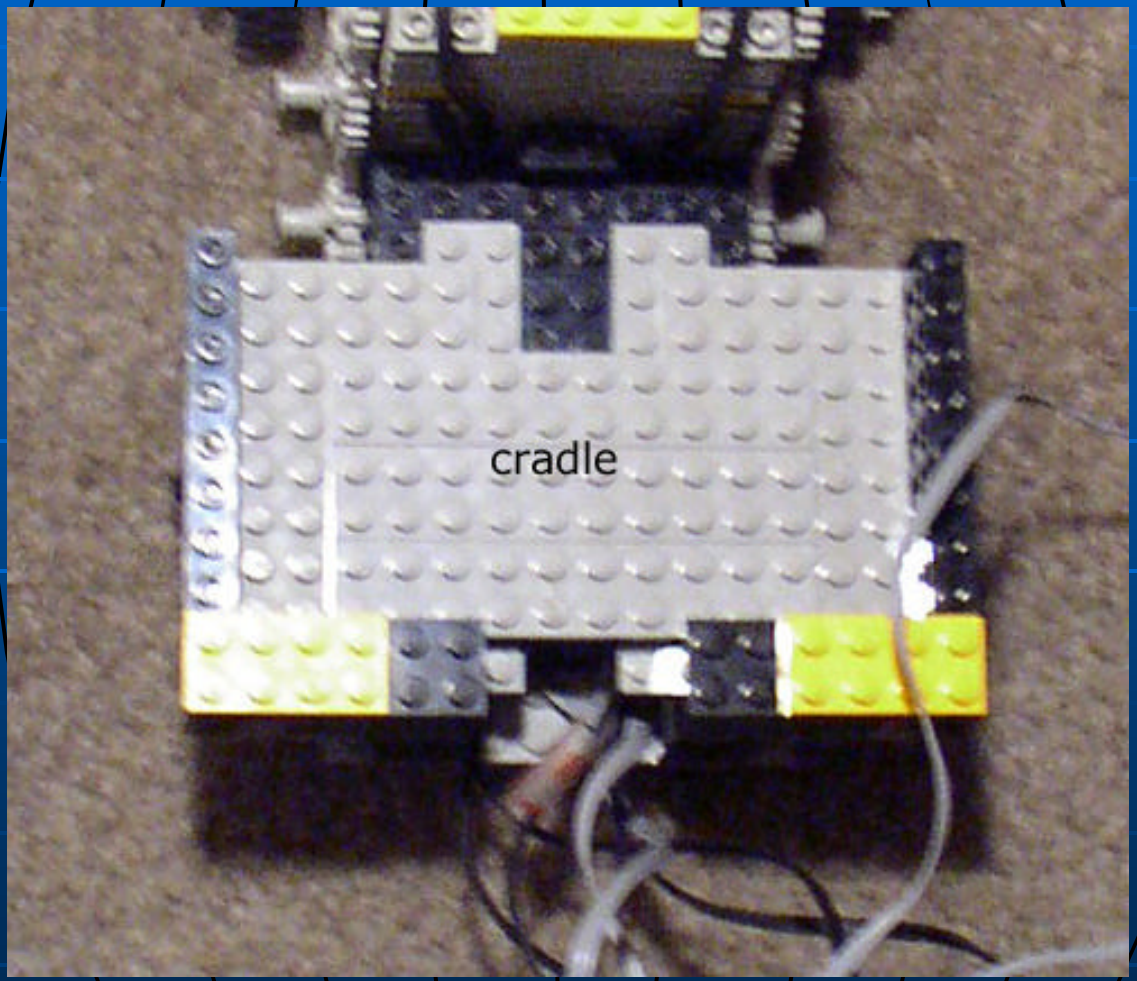
Tank!



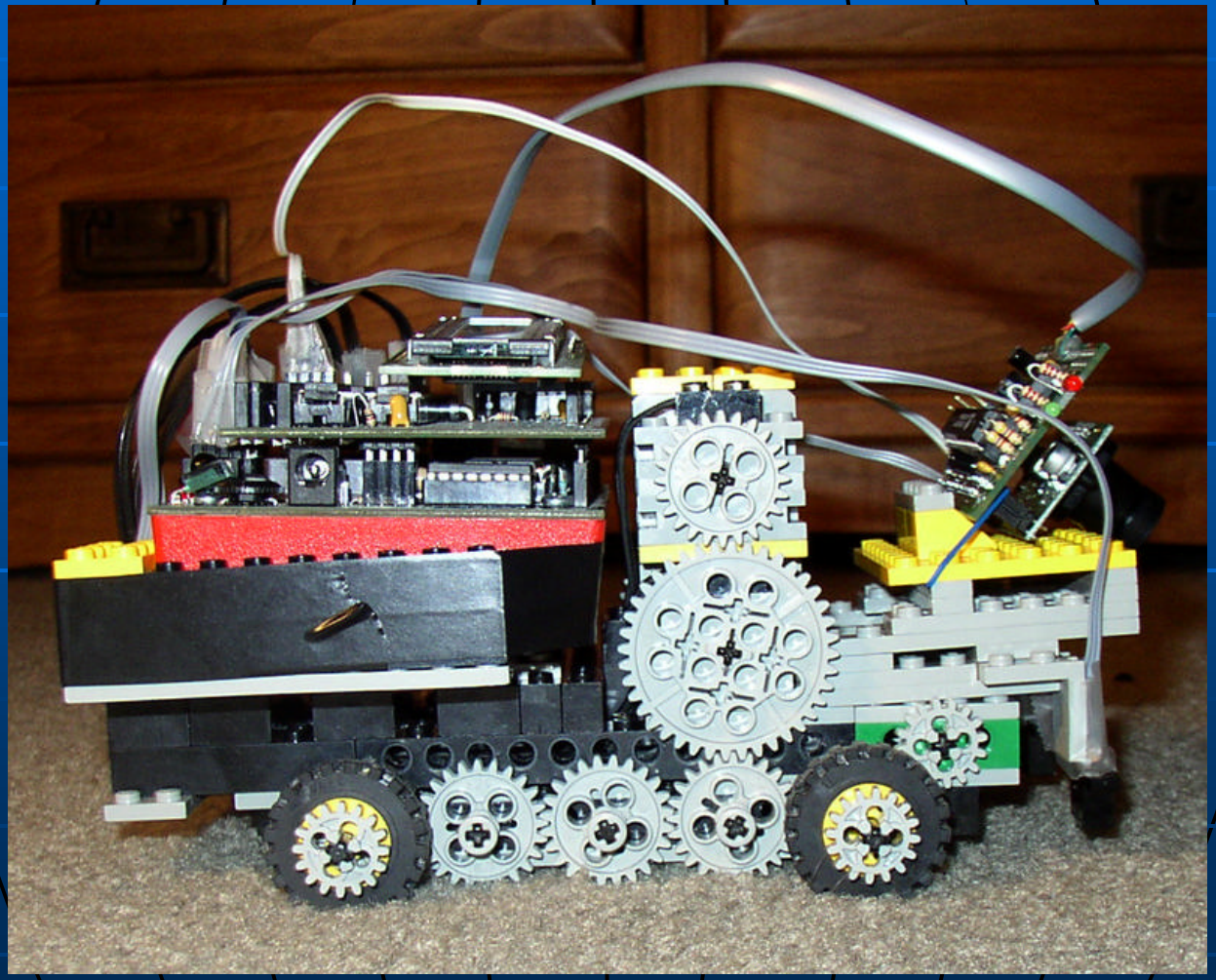
Chassis



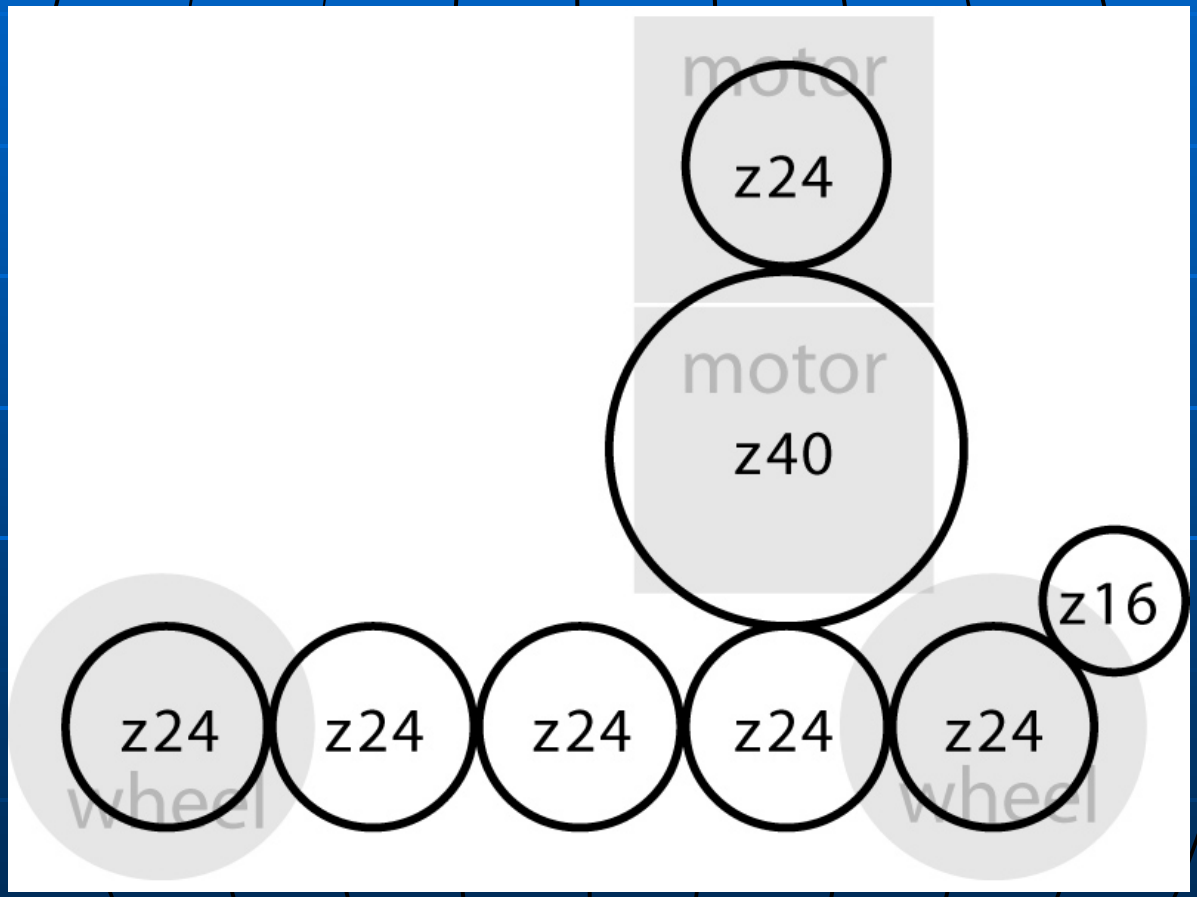
Cradle



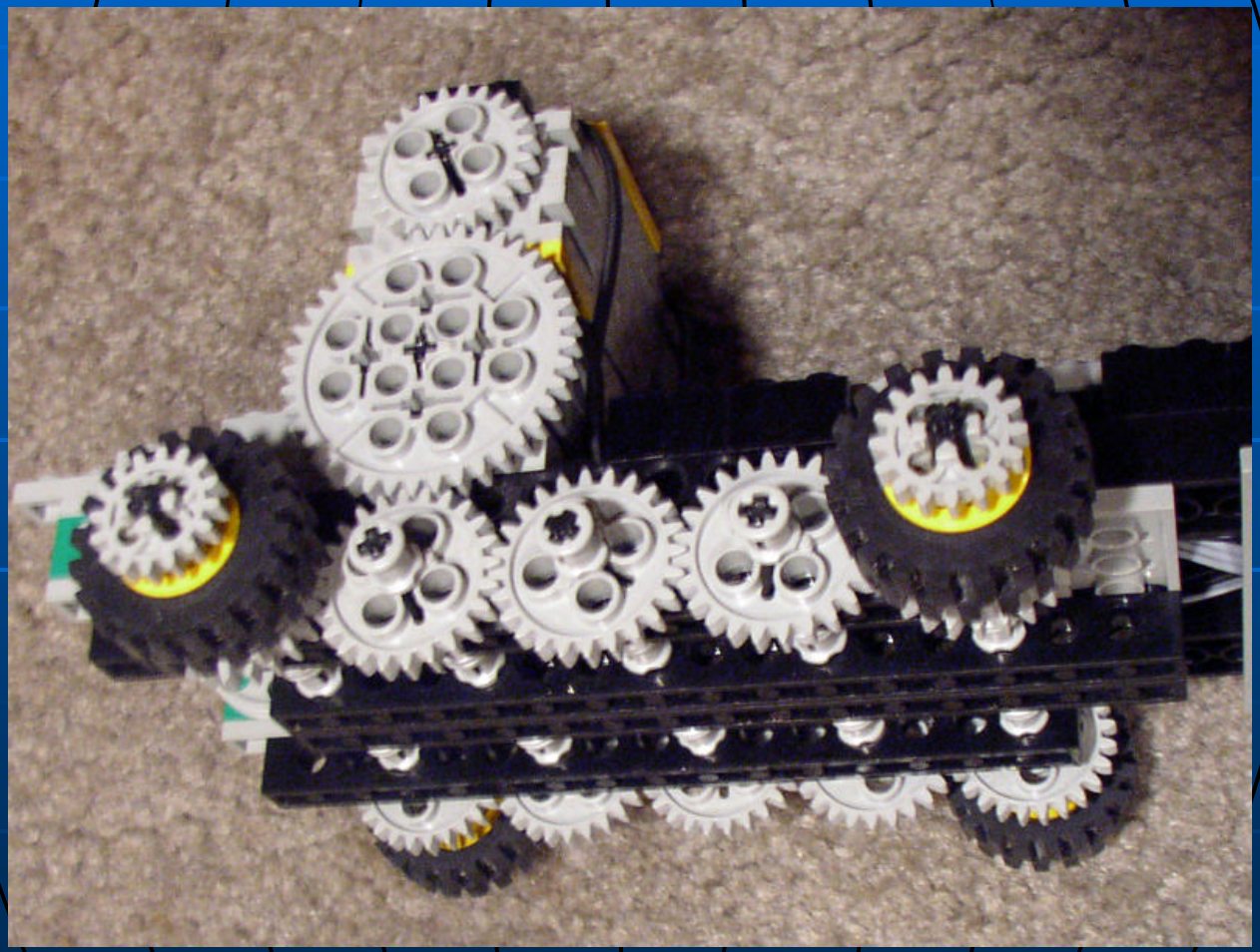
Suspension



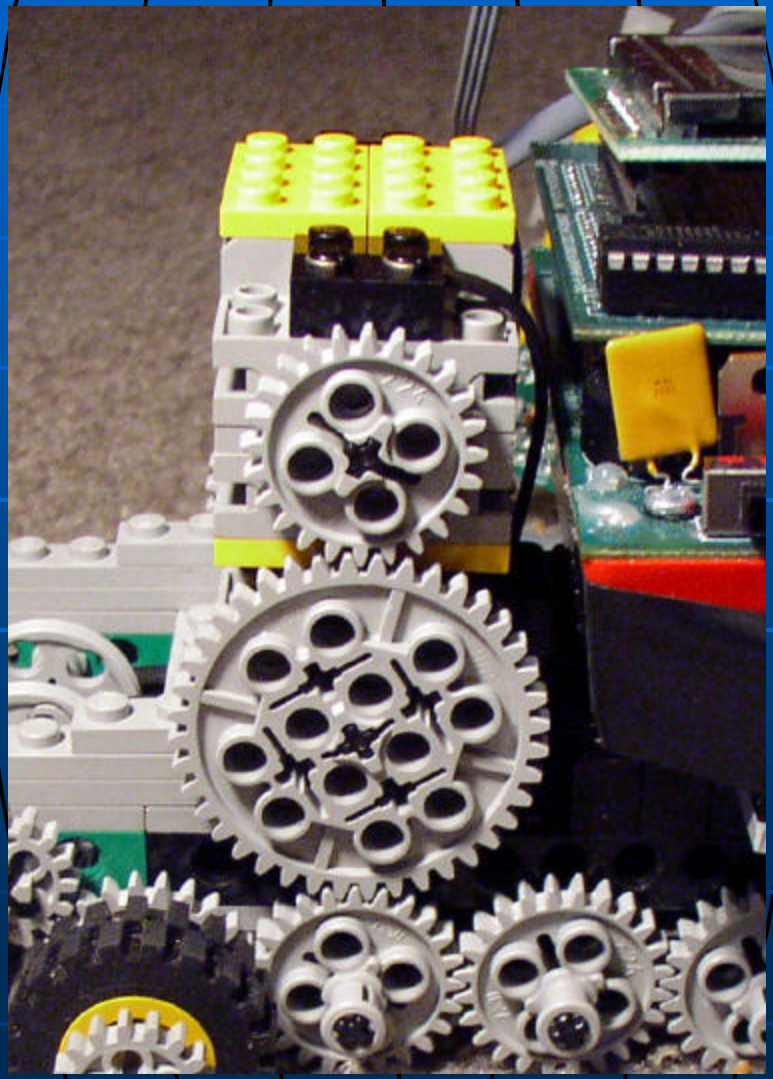
Gearing



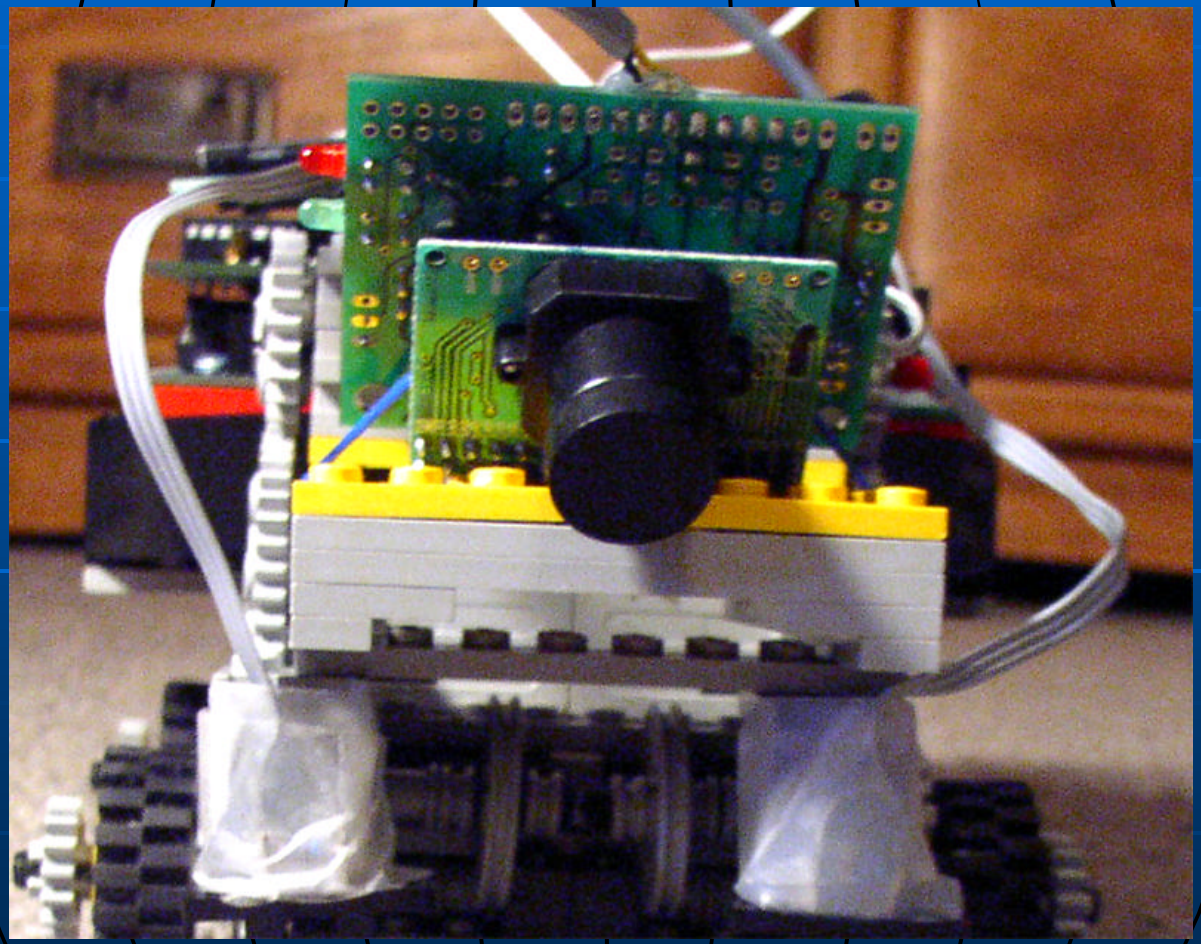
Gearing (2)



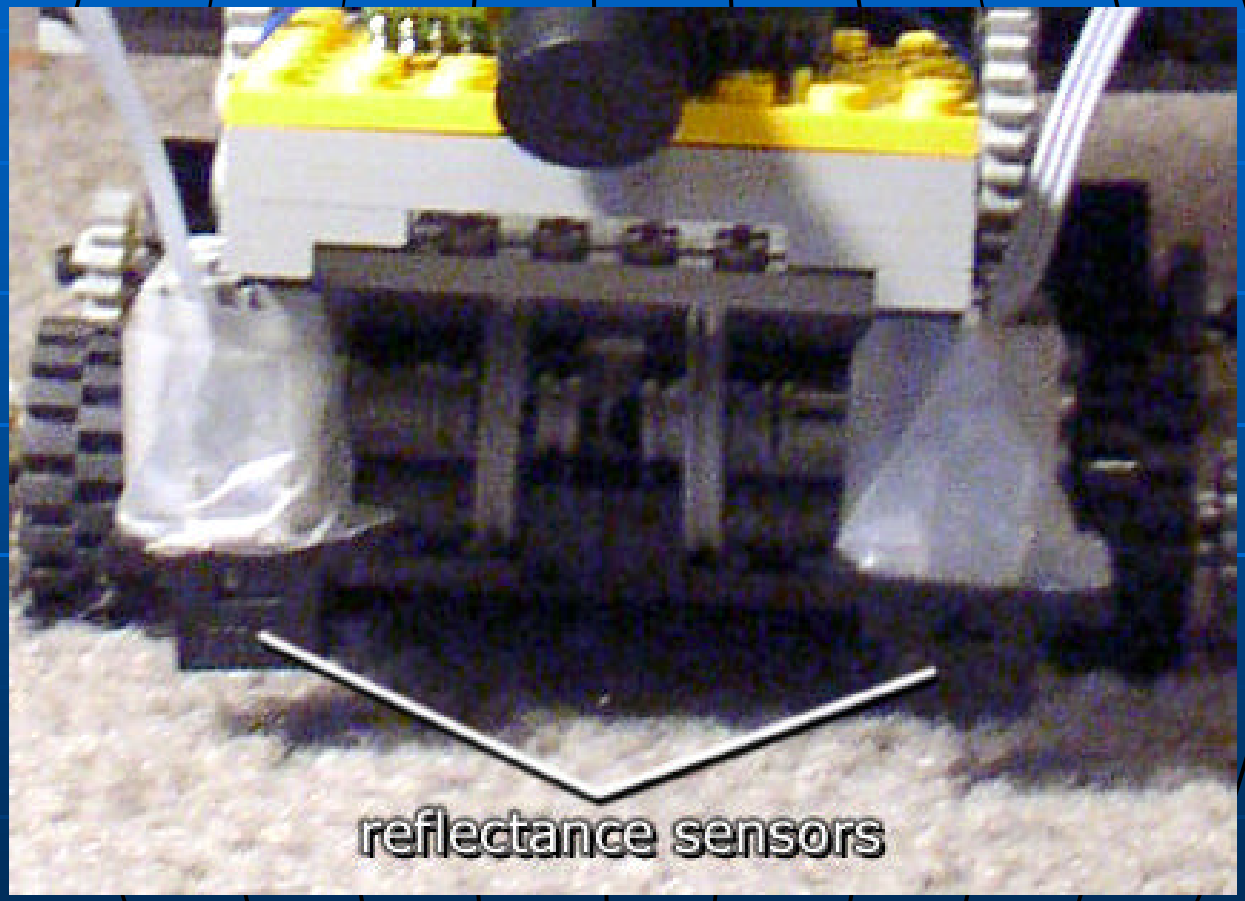
Motor Mount



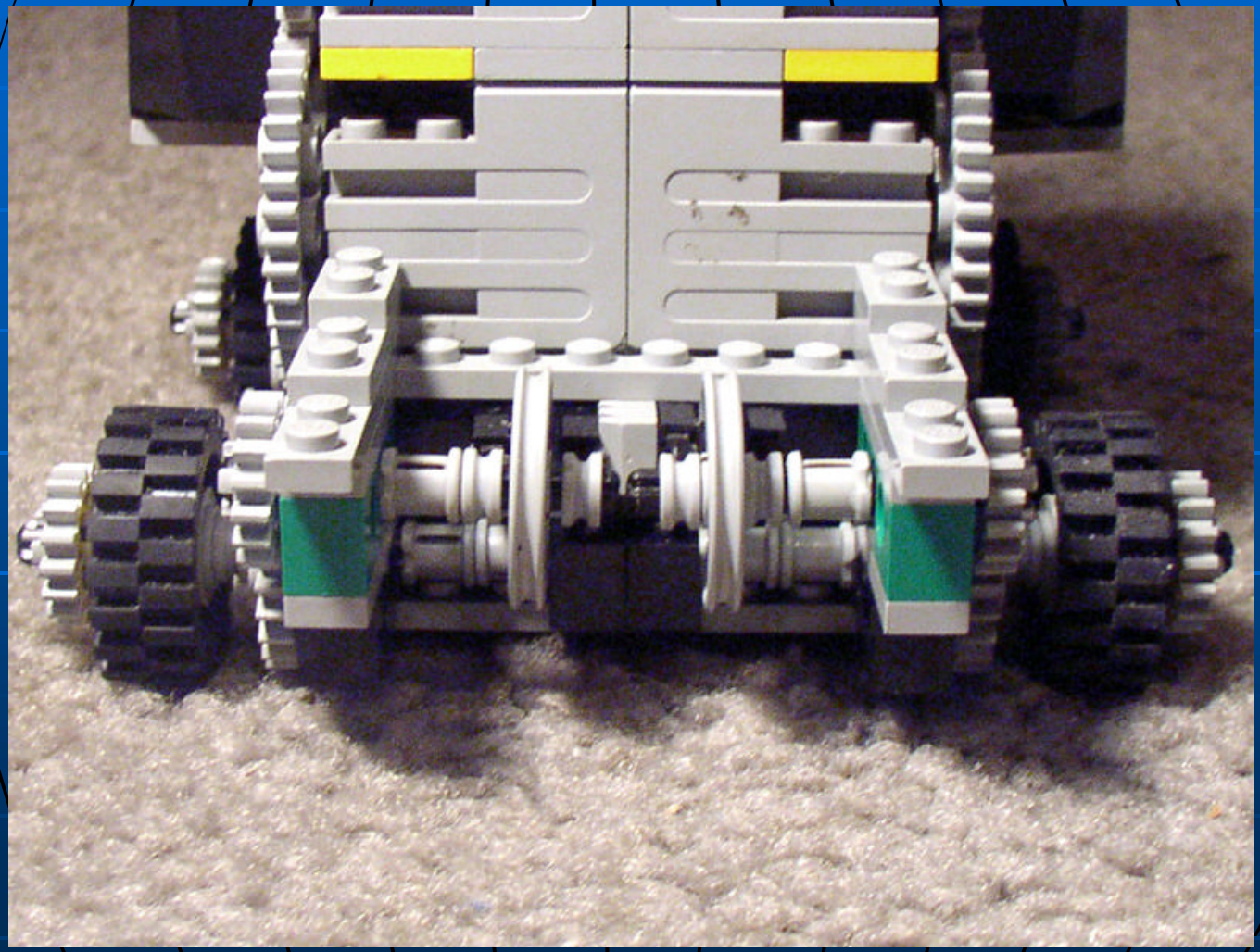
Sensor Mount: CMUcam



Sensor Mount: IR Sensors



Sensor Mount: Break Beam



Robot Code

- Functional Modules
  - Main
    - <Code Sample>

Code: main()

```
void main()
{
    init_camera();                  //initialize the CMU camera
                                    //set the camera white balance
    clamp_camera_yuv();
    alloff();               //all motors off at the beginning.
    while(!start_button());        //press start to start off the robot.

    //enable encoder channels before using them.
    enable_encoder(RIGHT_ENCODER);
    enable_encoder(LEFT_ENCODER);

    start_off();
    while(!stop_button())
      {
        //yellow color is not found.
        if (stop_flag == 1)
          break;
        track_color(); //detect color and do some actions
    }
    alloff(); //turn off all motors
}
```

Robot Code

- Functional Modules (cont.)
  - Detect Color
  - Sensing Black Tape
  - Going Straight
    - <Code Sample>

Code: go_straight()

```
//go in a straight line until a black tape is found. After that,
//align the robot with the black tape found.
void go_straight()
{
    int pid;
    go(RIGHT_INIT_SPEED, LEFT_INIT_SPEED);
    sleep(1.0);
    pid = start_process(check_tape());

    while(black_tape_found == 0)
      {
        msleep(1L);
    }
    //black tape is found. Reset the flag to be false.
    black_tape_found = 0;
    kill_process(pid);

    //align the robot with the black tape found.
    align();
}
```

Robot Code

- Functional Modules (cont.)
  - Turning
  - Alignment
- Algorithms
- Data Structures

Team Organization

- Overview
  - Personnel Division
  - Leadership

Team Organization (2)

- Evaluation:
  - Pros
    - Democracy
    - Teamwork Attitude
  - Cons
    - Workload Balance (no correction mechanism)
    - Availability of Equipment
    - Scheduling of Time

Team Organization (3)

- Revision Plan:
  - Division of Work
  - Time Organization

Conclusion

- Reorganization task assignment
- Plan more time to deal with hardware
- Not a bad job

Questions?