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December 03 - 09 Weekly Report

1 Progress

- New motor and wheel pair was ordered.

  The process of determining the right motor was as follows;

  – $$F = \frac{\tau}{R}$$

    where F is the force the wheel applies to the ground.

  – Weight Estimation $\approx 1\ kg$, which includes the followings

    * Powerbank
    * Motors
    * Wheels
    * Arduino
    * Raspberry
    * Motor Driver
    * Chassis

    which takes approximately 939 gr,

  – With $R = 1.5\ cm$, our estimation was that $\tau = 3\ kg - cm$ was enough for our purposes.

  – For that purpose *Karbon 6V 600Rpm Dc Motor* at was chosen, it has $\tau = 3,1\ kg - cm$ torque value at $6V$. Since we are planning the use this motor at $12V$, it is a fair assumption for our worst case scenario.

- Opencv was further studied. Our main algorithm for image processing includes as follows;

  – Image Sharpening

  – HSV Color Filtering

  – Canny Edge Detection

  - Hough Line Transformation

- The critical parts were proposed
  - Physical Module
    *Line-follower based robot
  - Software Module
    *Detection of Lane boundaries

2 Plans

- Motor tests will be conducted on new motors.
- The Processing of output data will be discussed.
- OpenCV will be studied further on Raspberry Pi.

Appendices

A Photos

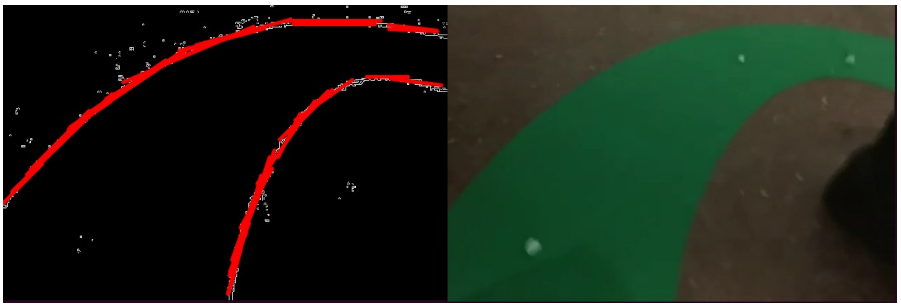

Figure 1: [Left]Output of Our Image Detection Algorithm Under Low Light Conditions, The Red Lines represents the Detected Line Edges and the [Right] Original unprocessed Photo