



Smart Package Transporter

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Background

- We aim to create a device that will be helpful for users that need to carry objects over distances.
- This device will be able to carry objects while following a host.
- The target audience will be postal workers and package delivery people, but the device will be able to safely transport nearly any cargo it is loaded with.

Project Goals

- Create an autonomous vehicle that interprets the world with camera input.
- This vehicle will be equipped with a sensor kit that aims to add autonomous features. This kit will allow the device to follow a certain object.
- By detecting hazards and obstacles, the system will be able to safely maneuver an environment while following a host.

References

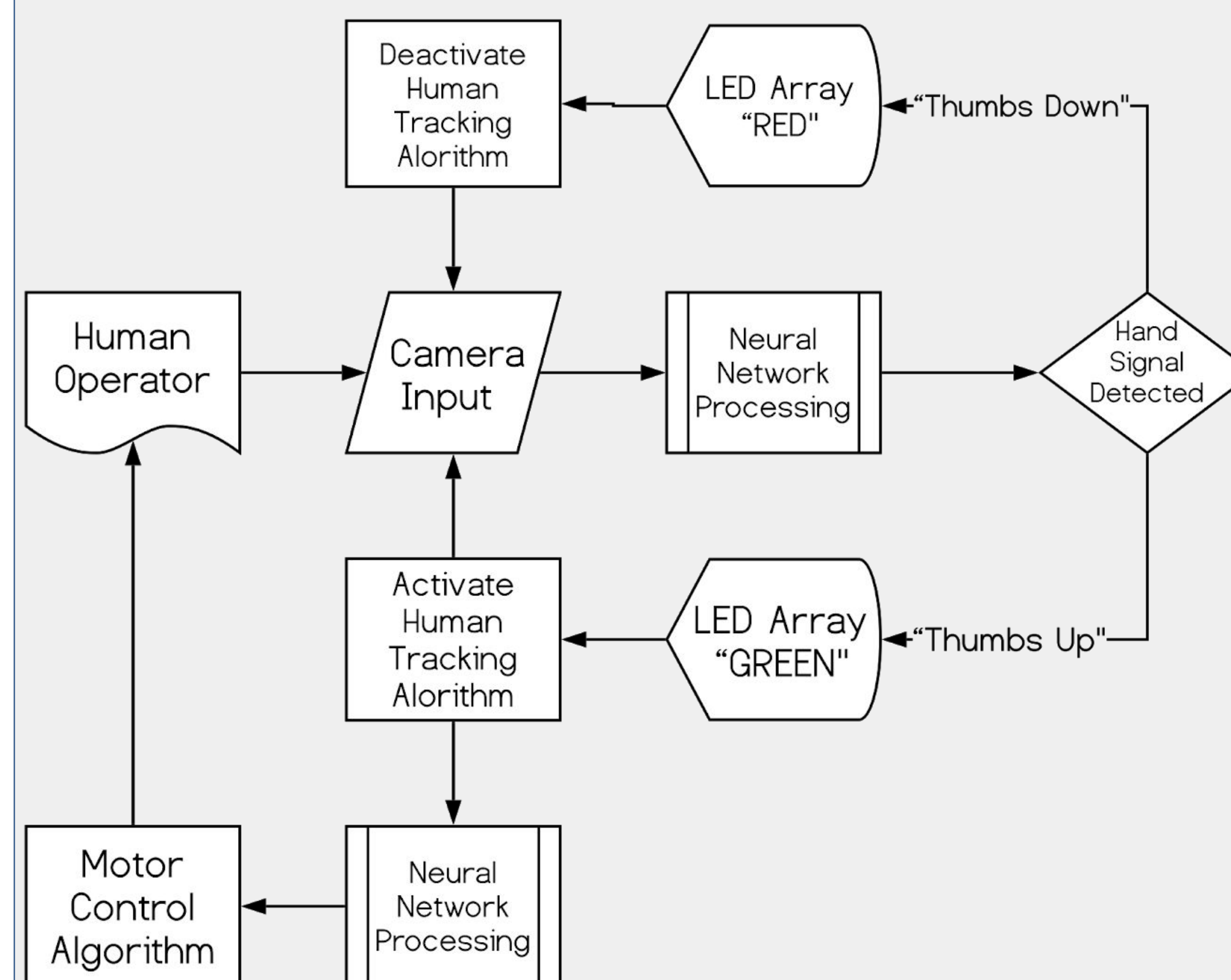
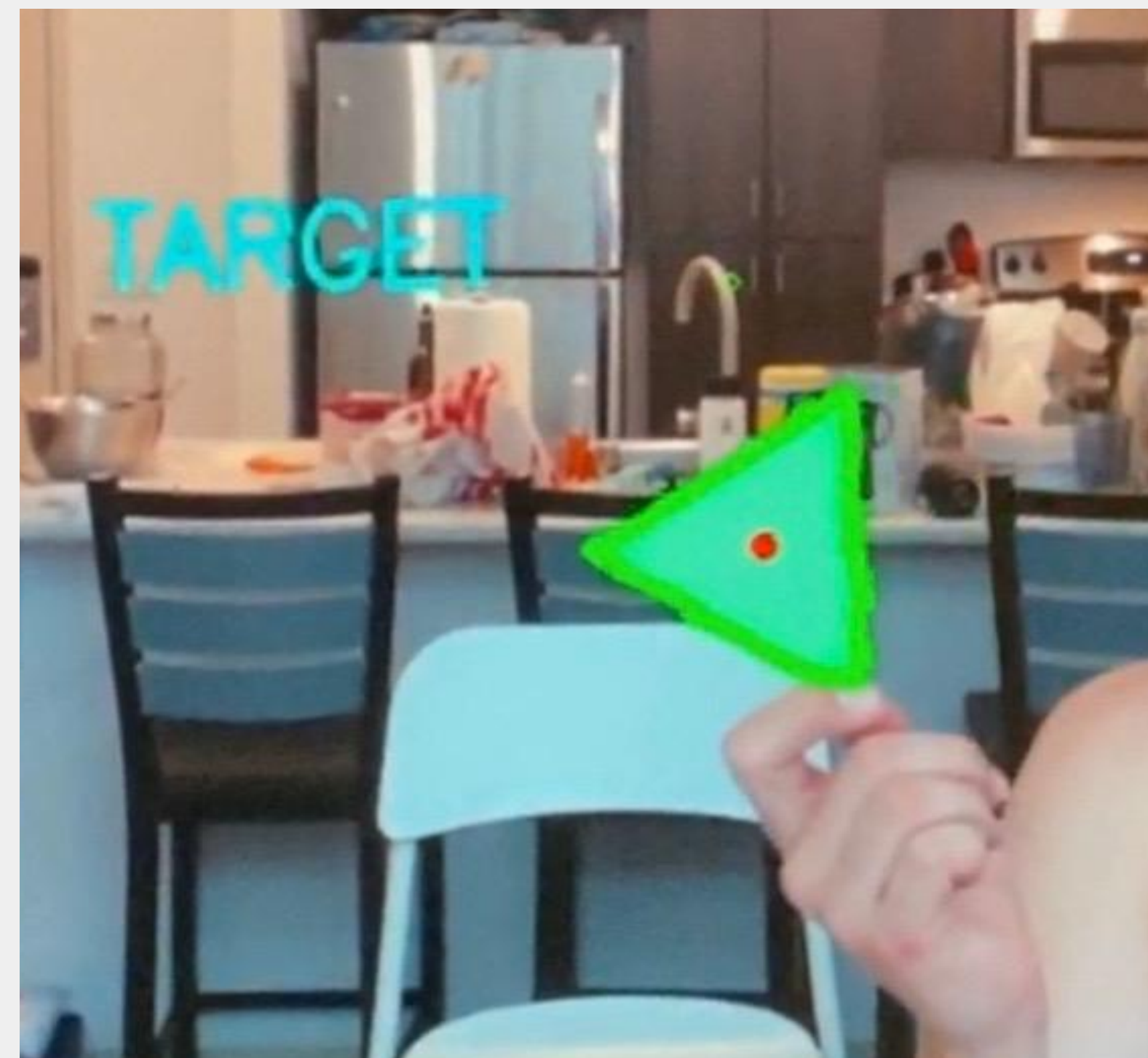
Dingles, D.F. (2001). Stress, fatigue, and behavioral energy. *Nutrition Reviews*, 1 (59).

Kaur, Kanwaldeep, and Giselle Rampersad. "Trust in Driverless Cars: Investigating Key Factors Influencing the Adoption of Driverless Cars." *Journal of Engineering and Technology Management*, Elsevier, 3 May 2018.

Lombardi, D.A., Folkard, S., Willetts, J.L., & Smith, G.S. (2010). Daily sleep, weekly working hours, and risk of work-related injury: US National Health Interview Survey (2004-2008), *Chronobiology International*, 27(5): 1013-1030.

Uehli, K, Mehta, A., et al. (2014). Sleep problems and work injuries: A systematic review and meta-analysis. *Sleep Medicine Reviews*, 18.

System Architecture



Progress/Future Work

- We are upgrading the chassis to a more robust frame to allow driving over more adverse terrain, while also carrying a heavier payload.
- Additionally, we are rewriting motor PID control and working to launch the neural network autonomous control.
- Main Objectives
 - Design sensor housing, new motors/gearboxes
 - Rebuild chassis (new frame, mount)
 - Design motor control system
 - logic to take serial input+heading->change orientation
 - Train Tensorflow model and implement with serial output

Materials

- Sensors
- NVIDIA Jetson Nano
- Arduino
- Motor Controllers
- Power Supply

