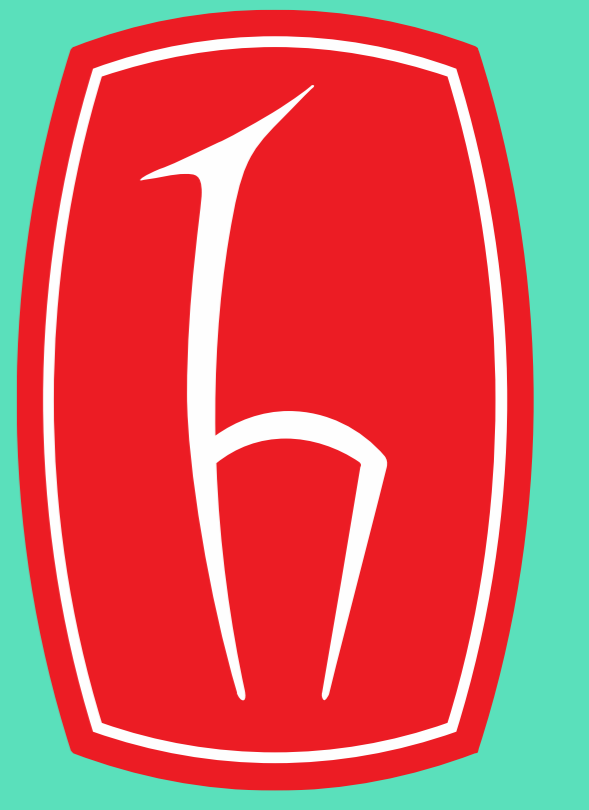# Solar Battery Electrical Vehicle for Gardening

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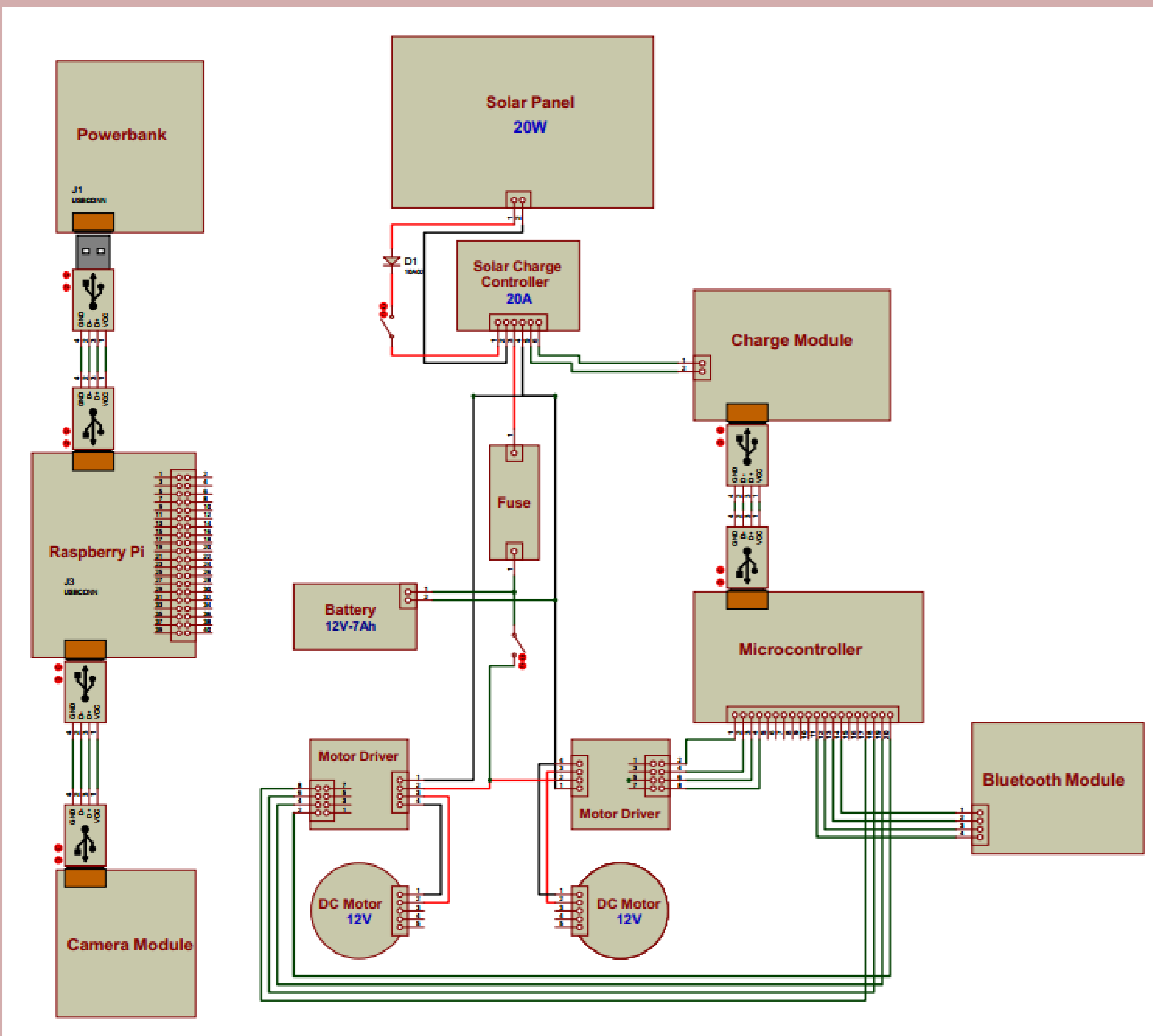
Introduction

This solar-powered gardening tool, controllable via Bluetooth with an Android phone, introduces sustainable technology with real-time object detection.

Specifically designed for gardening and agriculture, it reduces manual workload, operates cost-effectively through solar energy, and aligns with eco-friendly practices. This innovative solution integrates advanced features, offering a versatile and efficient tool for sustainable agricultural practices.

Features

- ✓ Live Video Streaming
- ✓ Real-time Live Object Detection
- ✓ Remote Control with Cell Phone
- ✓ Solar Charge to Battery
- ✓ Remote Monitoring
- ✓ Environmental Sustainability

Application Areas

Agriculture and Horticulture:
- Remote control and object detection facilitate agricultural and horticultural tasks.
- The use of renewable energy presents an environmentally friendly option and reduces energy costs.

Cargo Transport and Logistics:
- Remote controllability enhances the efficiency of cargo transport and logistics processes.
- The use of renewable energy reduces operational costs and minimizes environmental impact.

Military:
- Remote control capability in hazardous areas ensures the safety of military personnel.
- The ability to transmit images contributes to operational intelligence in military missions.

Disaster Situations:
- It can be utilized for quick intervention in disaster situations.
- Remote control and object detection capabilities facilitate rescue operations.
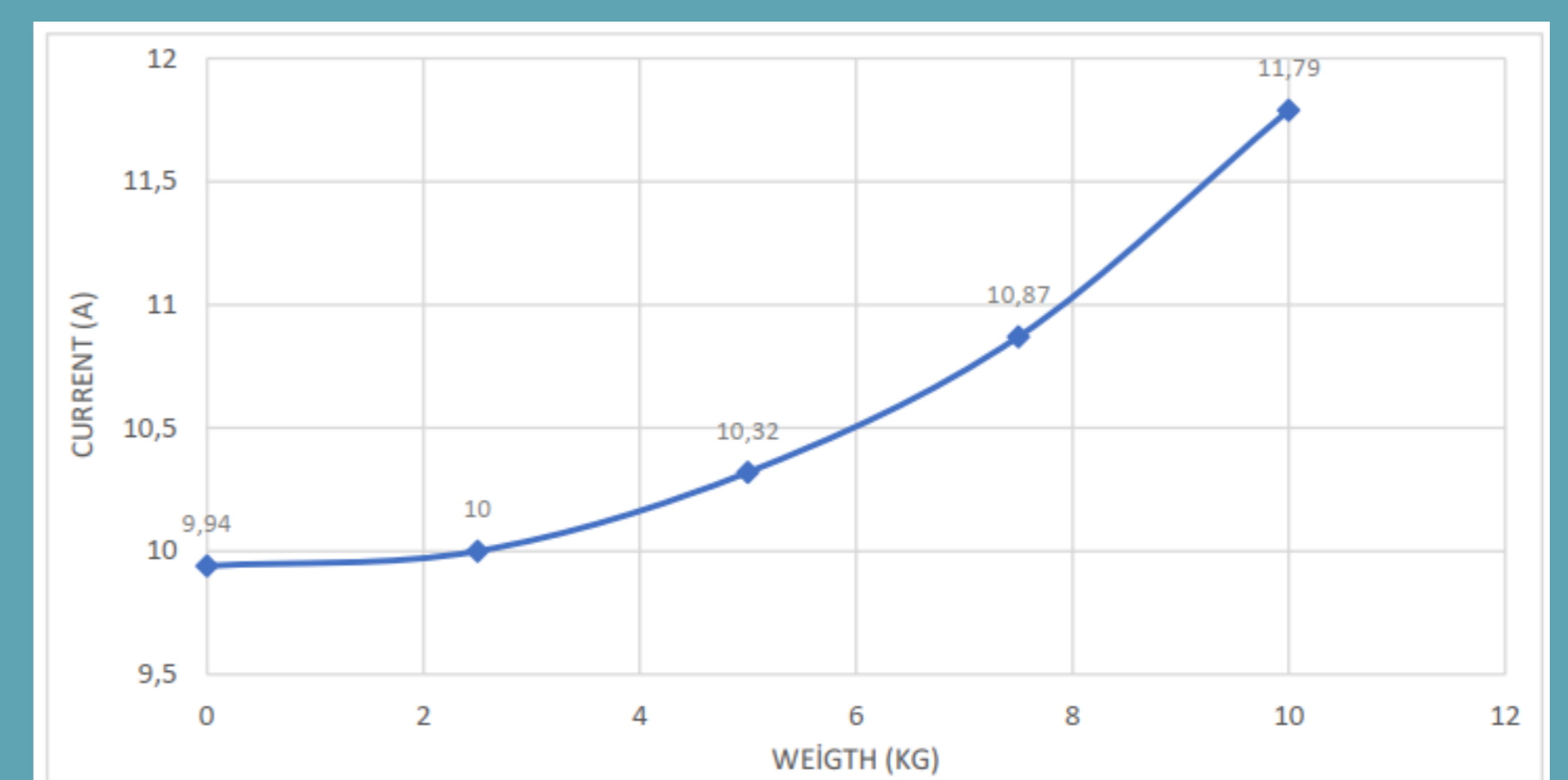
Project Hardware Design

Result and Conclusion

In our project, we successfully implemented a cutting-edge vehicle equipped with advanced features, as outlined in the project specifications and design requirements. The results are summarized below

The table below illustrates the real-time live object detection capabilities, showcasing the Frames Per Second (FPS) values for identifying objects during operation.

Method	FPS
Tensorflow Lite	4-5
Yolo	7-8
Live video streaming	15-16

The currents drawn by the vehicle were observed against the loads. The results are shown in the graph

References

- *Object Detection Documents : Cyganck, B. Object Detection and Recognition in Digital Images: Theory and Practice.*
- *TensorFlow Lite Documentation : https://www.tensorflow.org/?hl=tr*
- *YOLOv8 Documentation : https://yolov8.com/*
- *MIT App Inventor Documentation : https://appinventor.mit.edu/*
- *Motor Driver Documententation : https://pdf1.alldatasheet.com/datasheet-pdf/view/152658/INFINEON/BTS7960B.html*
- *Raspberry Pi Documentation : https://datasheets.raspberrypi.com/rpi4/raspberry-pi-4-datasheet.pdf*

Acknowledgements