

## GREEN INNOVATION FOR AFRICAN RENAISSANCE

# DESIGN AND IMPLEMENTATION OF A REAL-TIME TRACKING AND TELEMETRY SYSTEM FOR A SOLAR POWERED CAR

### 1. Abstract

Nowadays tracking systems are becoming very important to monitor electronic systems. The goal of the project is to achieve the real time tracking of the UJ Solar vehicle during the race.

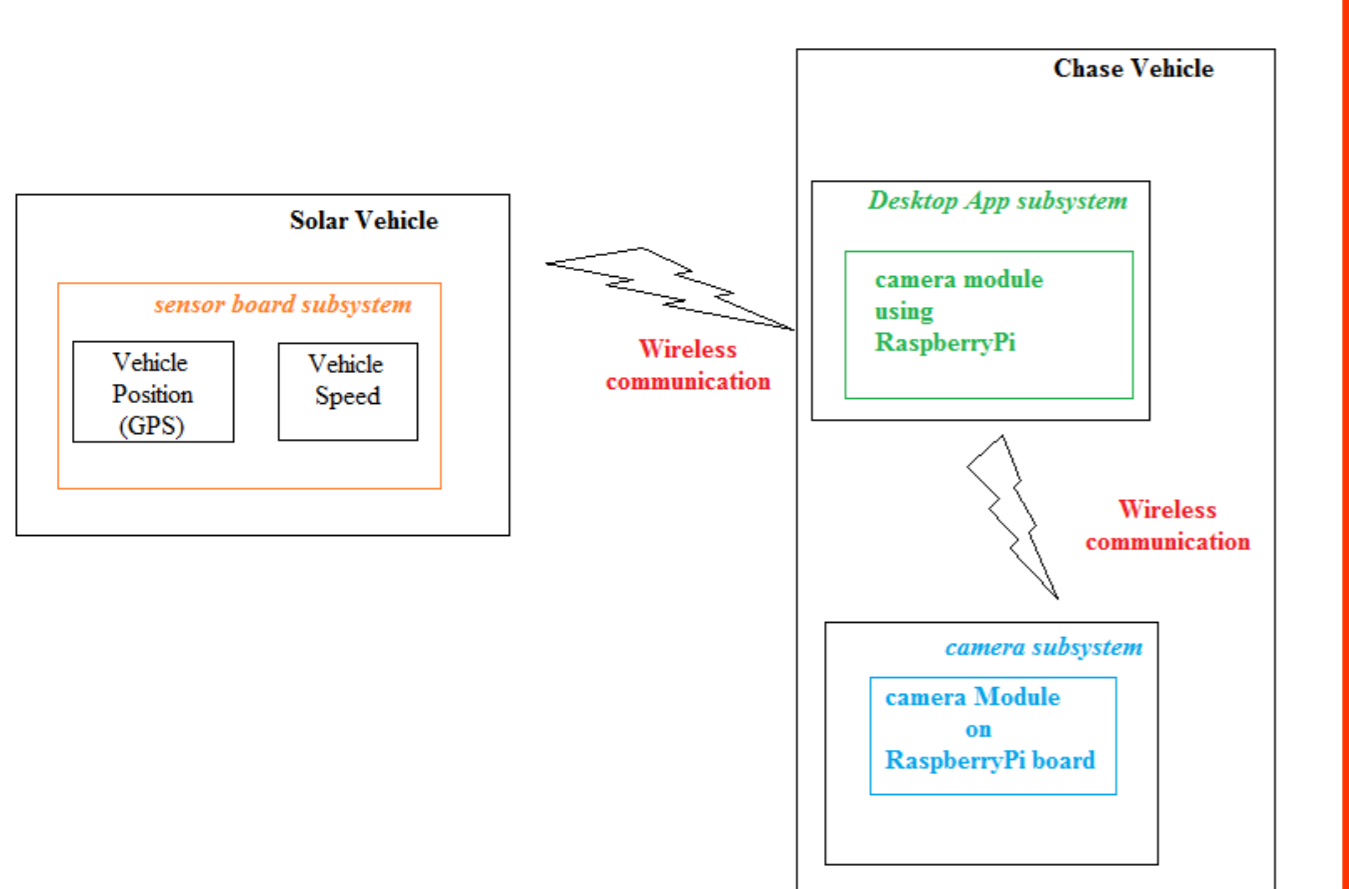


### 2. Objective

For an optimal telemetry system, the following subsystems have been proposed and achieved by the researcher:

- Implementation of the electronic board for the camera module
- Sensors board Design
- Development of a software application to visualize data.

### 3. Design

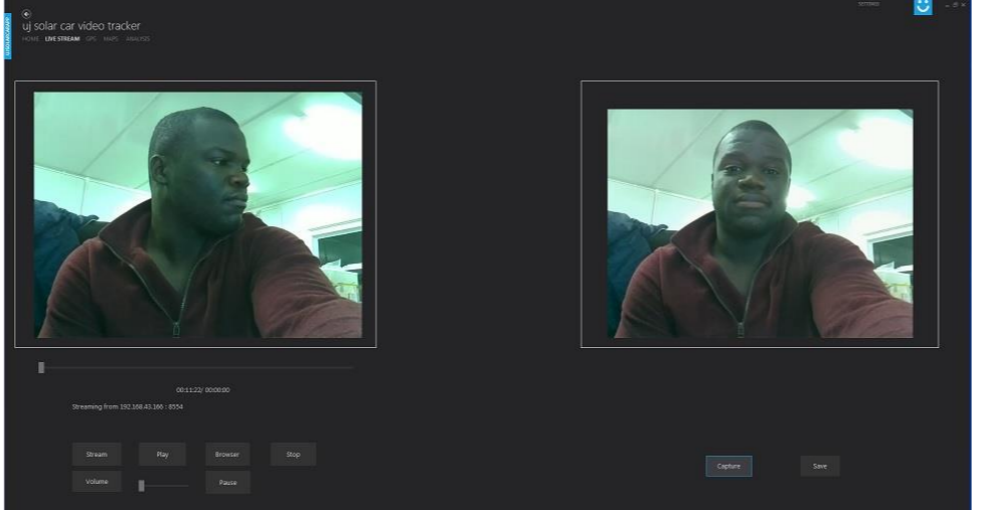


The System enables the real time visualization of the video feedback, the position by means of GPS coordinates as well as some technical telemetry information (speed, orientation) of the solar car from a remote computer over wireless communication.

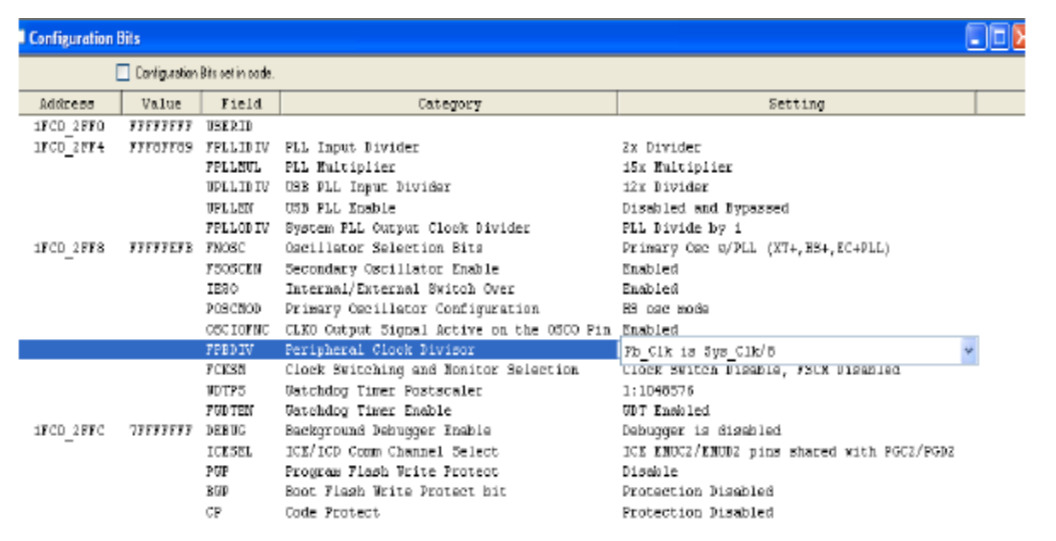
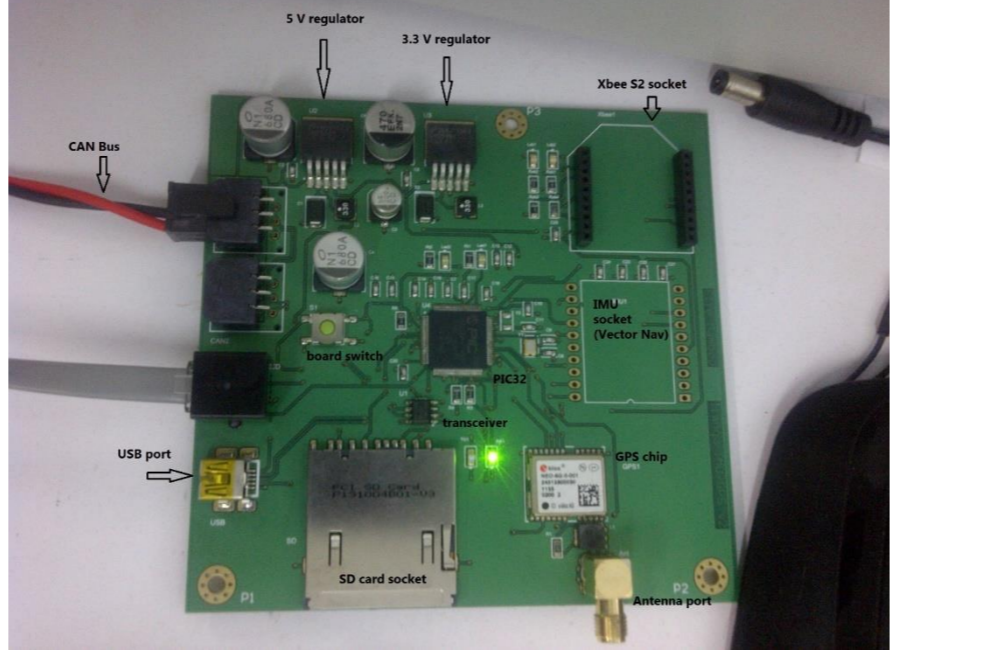
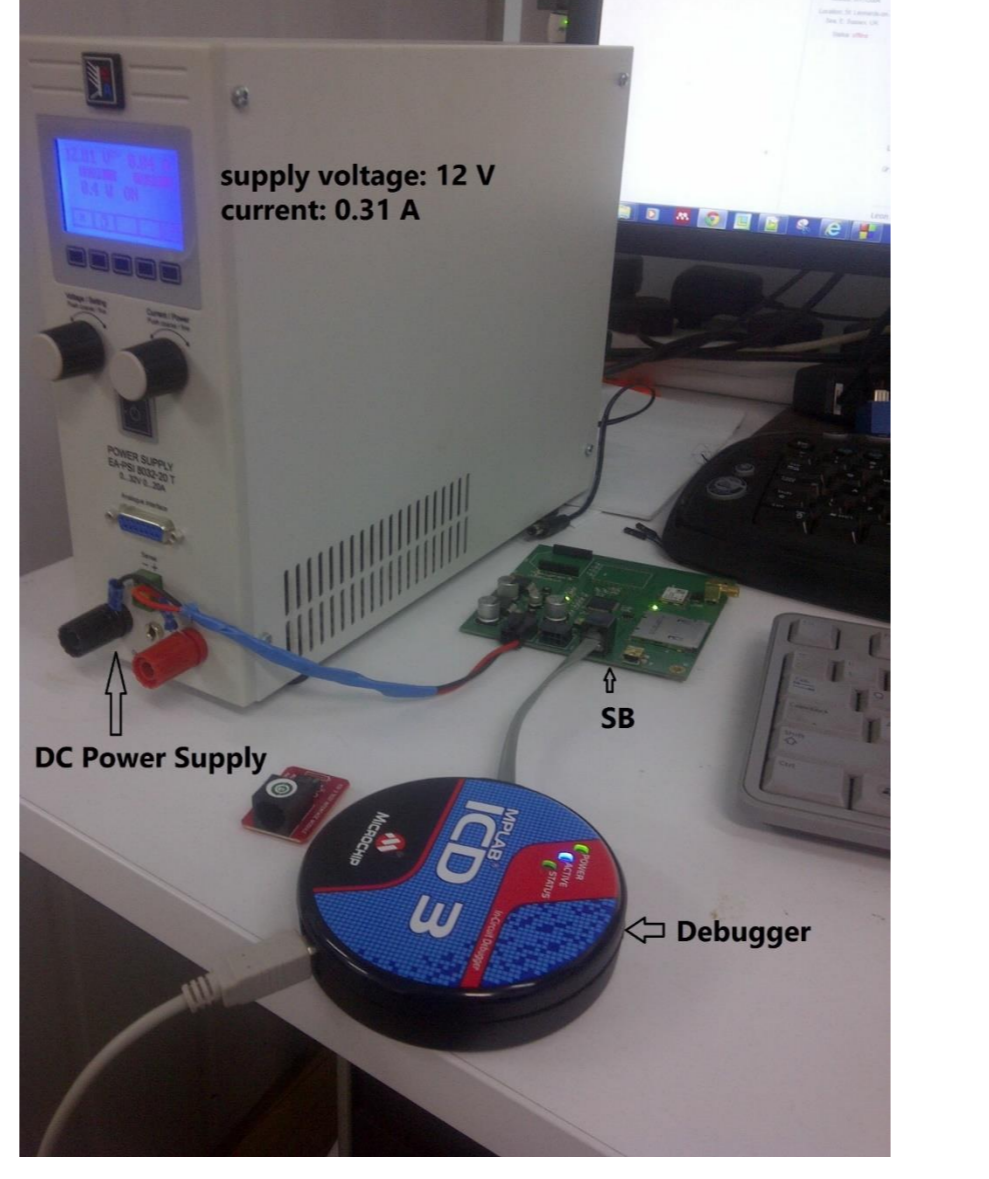
### 4. Results (1)



Transmission with 3 seconds delay

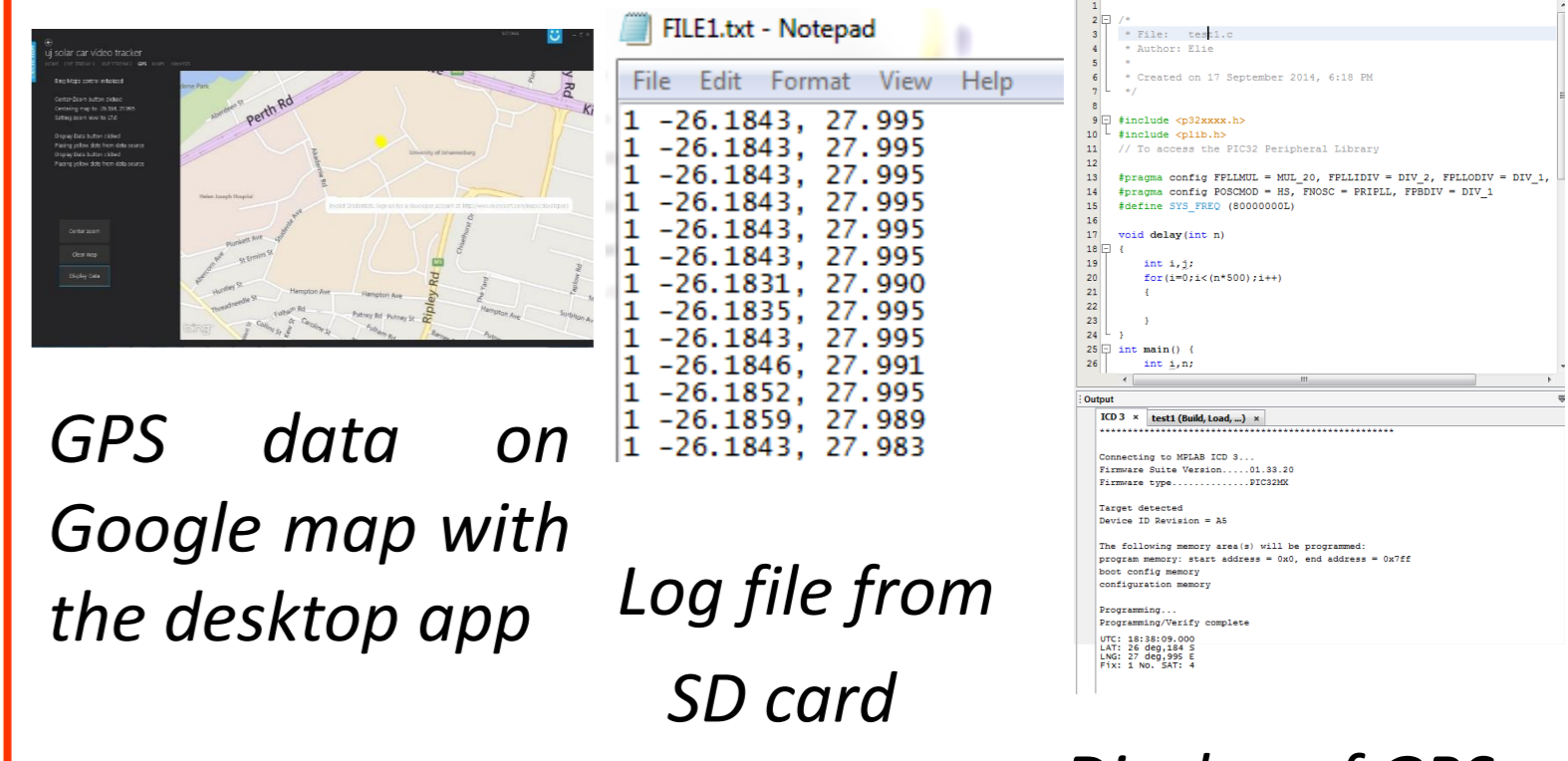


Tracking video from the desktop application



Sensor board setup and programming

### 4. Results (2)

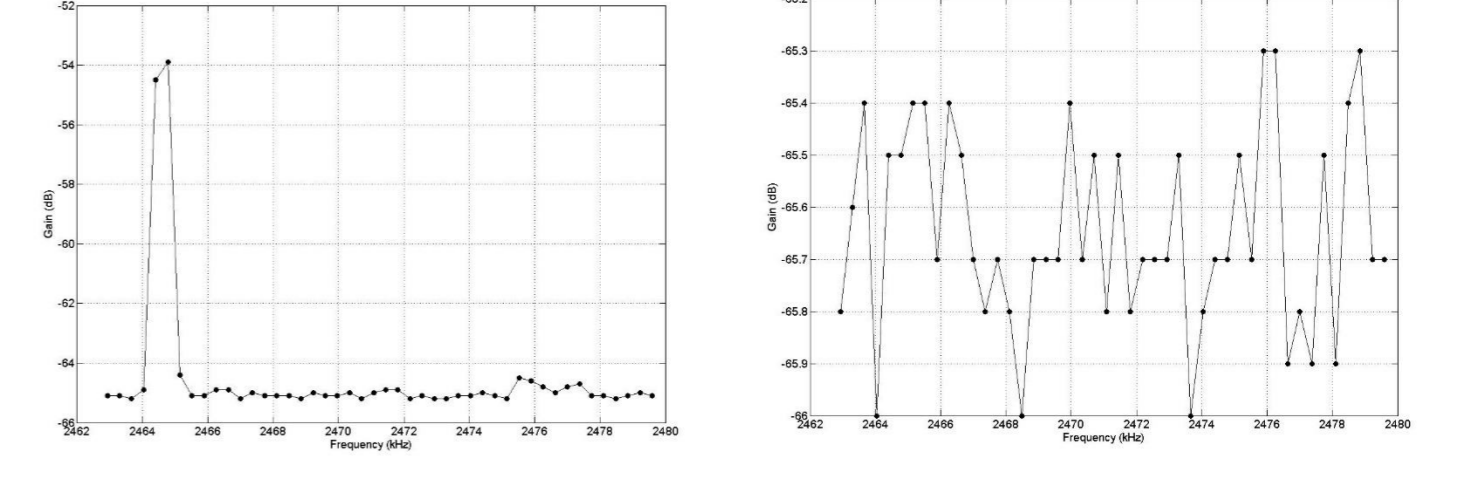


GPS data on Google map with the desktop app Log file from SD card

Display of GPS data

### 5. Discussion, Future Work and Conclusion

Interference in communication, Doppler effect, etc. Reliable system of surveillance embedded with GPS features using this approach.



Interference spectrums in Johannesburg

### 6. References

- [1] The syndicated, A Technical Newsletter for ASIC and FPGA Designers, Volume 5, Issue 1, Page 1.
- [2] Z. Taha, R. Passarella, et al., Application of Data Acquisition and Telemetry System into a Solar Vehicle, Computer Engineering and Applications Conference (ICCEA), 2010 IEEE International, 19-21 March 2010, pp.96-100.
- [3] Changwon Nam et. al., Interference type based channel management using adaptive bandwidth in wireless LANs, Personal Indoor and Mobile Radio Communications (PIMRC), 2010 IEEE International, 26-30 Sept. 2010, pp. 1360-1365.

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