

## **Google Summer of Code 2010 Application:**

### **Personal Information:**

**Name:** Zac Suresh Arackakudyil

**Email:** [zacsuresh@gmail.com](mailto:zacsuresh@gmail.com)

**eLinux wiki username:** zacsuresh

**IRC nickname:** Zackie

**University Name:** National University of Singapore

**Country:** Singapore

**Primary Language:** English

**Availability:** Throughout Summer Break, I will be located in Singapore which is at GMT + 8 hours. I will be available for work round the clock. Therefore the time zone difference would not affect a lot on my side. Once a mentor is assigned to me, I can arrange the suitable time with him/her.

**Open Source Experience:** My experiences in open source projects are very limited. I have however done various IT related and robotics related projects on my own or as part of university requirements. I want to work with Beagle Board and use it as my first step to start contributing to the open source community.

### **About your project**

#### **Car Assisting System with Image and Location processing**

<http://code.google.com/p/asil/>

BeagleBoard Project page: <http://beagleboard.org/project/Asil/>

I came across the above project in the beagleboard projects page. It really caught my interest due to its novel nature and the potential of the technology in the future. The overall project aims to achieve the following ...

- Live camera view of outer environment
- Car and obstacle recognition
- Modeling environment with accurate distances
- Integrating 3D modeling with gps system and some other 3D features(like

integrating google's streetview)

- Crash and risk warning
- Providing a base for car multimedia system
- Providing extensions (usb port, bluetooth connection to a 3G cell phone)
- Getting online content(up-to-date maps, etc...)

I want to make an OpenCV platform based on Beagleboard that can cover the requirement to identify and recognise cars and other obstacles. The project will include Installing OpenCV into Beagle Boards, creating and training cascades for OpenCV car and obstacle detection and algorithm planning to enable this section of the project to integrate with the other features required by the system like crash and risk warning.

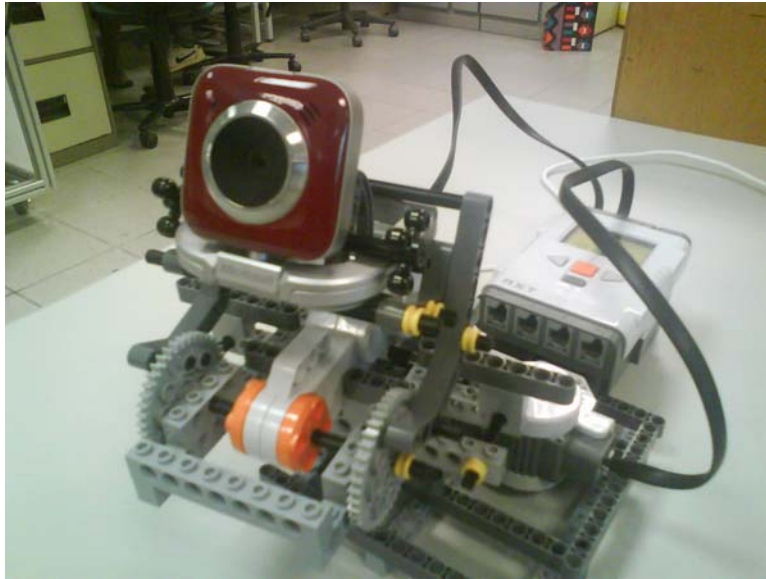
I have a lot of experience in working with OpenCV for object detection and face detection and tracking. But all those were in Windows or Linux based computers using C++. I intend to contribute to the project by using Beagle board with Angstrom using Python or maybe C++ itself depending on the amount of reference s and documentations I could find.

#### **Temporary Timeline:**

29 <sup>th</sup> May to 12 <sup>th</sup> June :	Installing OpenCV in Beagle Board, running examples of object detection and troubleshooting using webcam
13 <sup>th</sup> June to 3 <sup>rd</sup> July:	Creation of OpenCV cascades for vehicle detection and other possible obstacle detection
3 <sup>rd</sup> July to 12 <sup>th</sup> July:	Integrating the OpenCV cascades with the Beagle Board to test effectiveness and troubleshooting
13 <sup>th</sup> July to 9 <sup>th</sup> August:	Integration OpenCV detection algorithm alongside with other features of the entire project.

#### **My past Experience with Open CV:**

I have worked as part of University Research under Prof Marcelo Ang ([mpeangh@nus.edu.sg](mailto:mpeangh@nus.edu.sg)) of the mechatronics department of my University to work with OpenCV and object detection. I have created a robust face-tracking robot using Lego Mindstorm and OpenCV. The practical application of this little prototype will vary from Improved Closed Circuit Television Vision with intelligent recording to Automated Robotics Rescue Crew in places of natural disasters.



I could create a similar system to detect car and other vehicles, which may be required for the project. The greatest challenge would be to get the entire OpenCV system to work within a Beagle Board, but due to this being previously done and with the help of documentations already available, I believe I could easily overcome this challenge. Then by putting all together and to work with the entire Car Assisting system, I believe I have the knowledge and expertise to finish the project in the stipulated time period.

### **The community and my project:**

My project will benefit many other BeagleBoard projects that would require any sort of image processing like Beagle Home Security System, Distant Camera Remote Wildlife Survey, Beagle Bird and many more. Moreover the OpenCV cascades that I train will be openly available and can be used by anyone Open Source fan to develop similar project on any other platform.

### **Obstacles and how I will overcome them:**

Being stuck while doing a project is common to every one. I have been in such situation throughout my other projects and assignments. Although my mentor is not available at these situations, I have acquired the skills to go online and find solutions through forums and online groups. Moreover, my working in mechatronics department for a few projects, I have made a lot of friends working in lot of similar projects using OpenCV and other ARM processors. I could always turn to them for quick advice and help and any point of time.

### **Miscellaneous**

I would like a BeagleBoard if I selected to continue on with project. If you could loan one to me, it would be great. Moreover if there any suggestion that you like me to consider, please do let me know.