

# **UNIVERSITY OF MORATUWA**

Faculty of Engineering



Registered Module No: EN3992

## **INDUSTRIAL TRAINING REPORT**

LE Robotics (Pvt.) Ltd.

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# Preface

This report was composed as partial fulfillment of the requirements of Module EN3992 - Industrial Training, in the curriculum of B.Sc. in Engineering (Electronic and Telecommunication) at the University of Moratuwa, Sri Lanka. The experience and knowledge that I gained during the six months of my industrial training were used and were the inspiration to create this report.

# Acknowledgment

I would like to gratefully acknowledge all of the people who helped me to make this six months of special industrial training period a massive success, starting from the point of applying to a company to the point I left the training organization at the completion of six months.

First of all, I would like to express my heartfelt gratitude to Professor Kapila Jayasinghe who was our supervisor for us throughout the six months of the internship period. The advice he provided us with regard to professional engineering practices and ethics was invaluable. In addition to that the directions he provided us to gain the required technical skills required for the allocated project were priceless. I believe the mindset that he built in us, towards working under minimum supervision, will be a massive support for us to thrive in the fast-moving industry.

Next, I would like to express my gratitude toward Miss. Laknie Jayasinghe who was the Engineer in charge of us in our training period. The support she provided us to improve our soft skills as well as technical skills as a professional engineers, is highly appreciated. The support she provided when composing the technical documentation of my allocated task by pointing out the mistakes and the areas of improvement was invaluable and must be mentioned at this point. Moreover, her support in validating the project deliveries at the end of the training period is highly appreciated.

Last but not least, I would like to express my heartiest gratitude to Mr Janka Kulathunga, the manager of the Lanka Electronics research and development section and Mr Aloka Perera, an electronic engineer in LE Robotics (Pvt.) Ltd for being available for us whenever we needed their support.

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*\*PDF is clickable*

# List of Abbreviations

**OOP** Object Oriented Programming

**RPi** Raspberry Pi

**CV** Computer Vision

Use of acronyms:

I have use Object Oriented Programming (**OOP**) here. **OOP** is very power full. Raspberry Pi (**RPi**) is a single board computer. Computer Vision (**CV**) is the area of mimicking human vision.

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# **Chapter 1**

## **Description of the organization and business, its past, present and future**

# **Chapter 2**

## **Description of familiarization work carried out**

# **Chapter 3**

**Exposure to systems (HSE, Financial,  
Administration, Logistics, etc.)**

# **Chapter 4**

## **Project Work**

By title the project that I was assigned, was ***Machine vision based Real time Motion Planning for an Industrial Articulated Robot Arm.*** In simple words it was a project related to an automatic pick and place machine which can be used to pick objects placed on a conveyor belt and pass them to the next stage of processing.

My contribution to that project was to develop the following three aspects of the system.

- I. Development of an object detection framework:
- II. Development of an application to train an object classification model
- III. Development of an application for camera calibration

Subsequent sections will thoroughly explain the mentioned sub projects that were undertaken by me.

### **4.1 Development of an Object Detection Framework**

The first project that I was assigned as a trainee electronic engineer was related to Computer vision field. An Object Detection Framework was developed to be deployed in an Automatic Pick and Place Machine. The framework is capable of, identifying regions of interests (ROIs), detecting and classifying objects, determining location and orientation of objects with respect to a real world coordinate system for grasping (picking).

# **Chapter 5**

## **Hands on experiences**

# **Chapter 6**

## **Soft Skills Development**

# **Chapter 7**

## **SWOT Analysis of the organization and self**

# **Chapter 8**

**Conclusion: Own perspective of areas to be improved (of the whole training process including self)**

# **Appendices**

# **Appendix A**

## **Guidelines**

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