

**Industrial Internship Report on**  
**"Crop and Weed detection"**

**Prepared by**  
**Yogeshwar Singh**

*Executive Summary*

This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT).

This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks' time.

My project was (Tell about ur Project)

This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

## **TABLE OF CONTENTS**

1	Preface .....	3
2	Introduction .....	4
2.1	About UniConverge Technologies Pvt Ltd .....	4
2.2	About upskill Campus .....	8
2.3	Objective .....	9
2.4	Reference .....	10
2.5	Glossary .....	10
3	Problem Statement .....	11
4	Existing and Proposed solution .....	12
5	Proposed Design/ Model .....	13
5.1	High Level Diagram (if applicable) .....	13
5.2	Low Level Diagram (if applicable) .....	13
5.3	Interfaces (if applicable) .....	13
6	Performance Test .....	14
6.1	Test Plan/ Test Cases .....	14
6.2	Test Procedure .....	14
6.3	Performance Outcome .....	14
7	My learnings .....	15
8	Future work scope .....	16

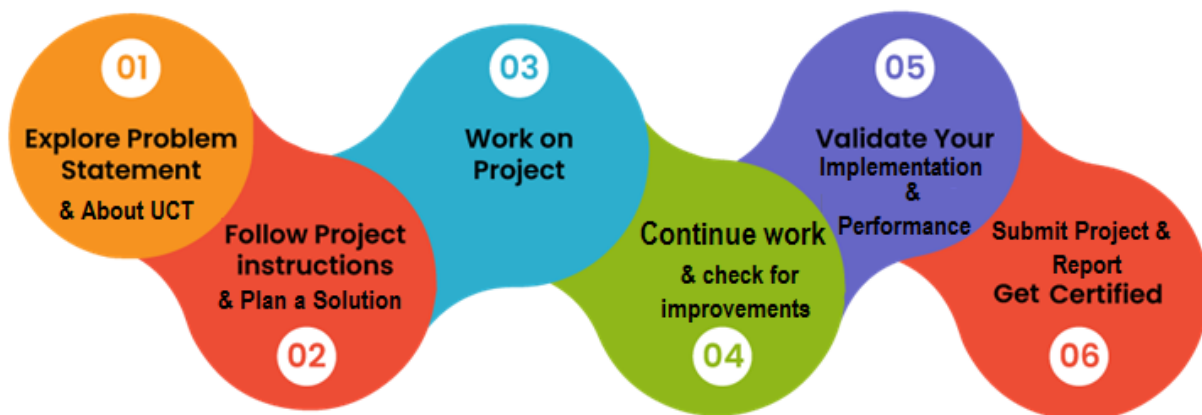
## 1 Preface

The project "Crop and Weed Detection" represents a pivotal step in my journey towards understanding and addressing real-world agricultural challenges. My initial task involved navigating the complexities of a dataset provided in YOLO format, which presented a unique challenge. However, this experience enhanced my analytical skills as I worked to prepare the data for model training.

Utilizing a Convolutional Neural Network (CNN), I trained my machine learning model to accurately distinguish between crops and weeds. The culmination of this effort resulted in a highly effective classification of test images, demonstrating the potential of technology in agriculture. By developing a system that precisely targets weeds for pesticide application, my project aims to minimize pesticide waste and prevent contamination of crops.

This internship at Uni-Convergence Technology Ltd. (UCT/USC) was invaluable, providing me with an environment to grow both personally and professionally. I was able to identify my strengths and pinpoint areas for improvement, reinforcing the importance of internships in shaping one's career path.

The program was thoughtfully organized, with a structured schedule that kept my work on track and ensured timely reporting. I am grateful for the opportunity to develop my skills in such a supportive setting, and I look forward to applying what I have learned in future endeavors.



I would like to thank Upskill campus for providing me this opportunity and the tools and materials. This internship has profoundly impacted my learning journey, fostering both professional and personal growth. I have gained greater proficiency in my field of study—Data Science and Machine Learning. I extend my heartfelt thanks to my co-mentors and the internship organizers for this invaluable opportunity to enhance my skills and support my career development.

## 2 Introduction

### 2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies** e.g. **Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.



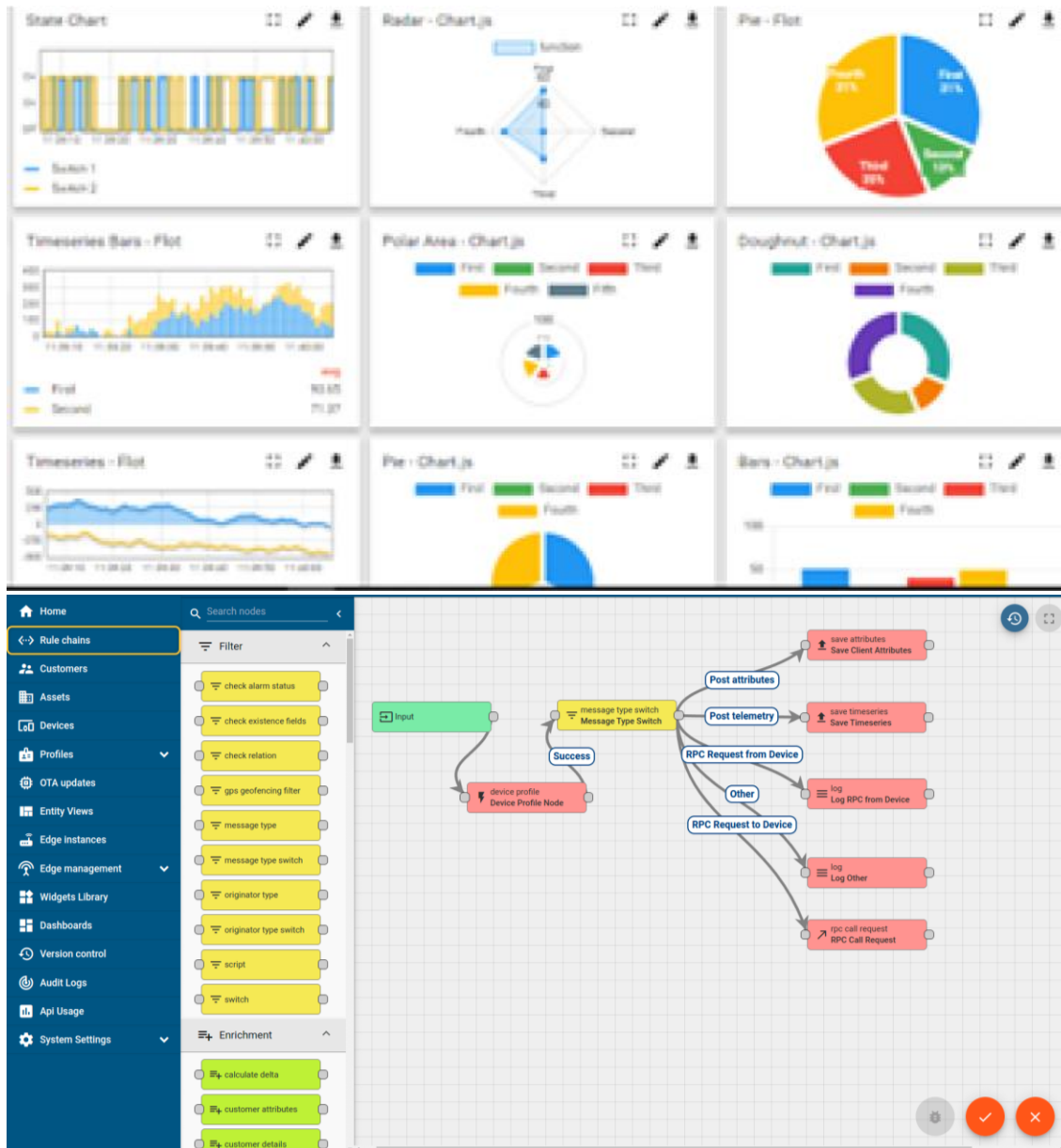
#### i. UCT IoT Platform ( **Insight** )

**UCT Insight** is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable “insight” for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine



## FACTORY WATCH

### ii. Smart Factory Platform ( )

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleash the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they want to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.





Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i



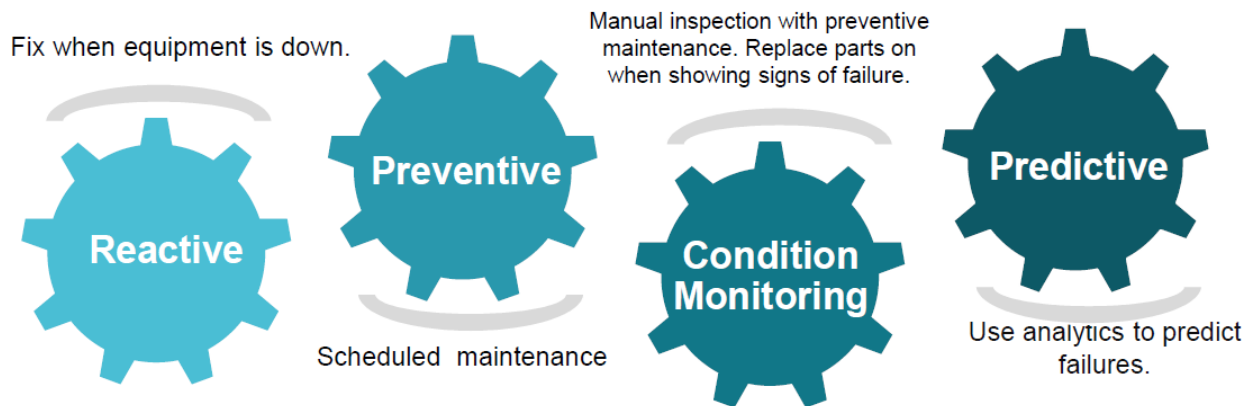


### iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

### iv. Predictive Maintenance

UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.

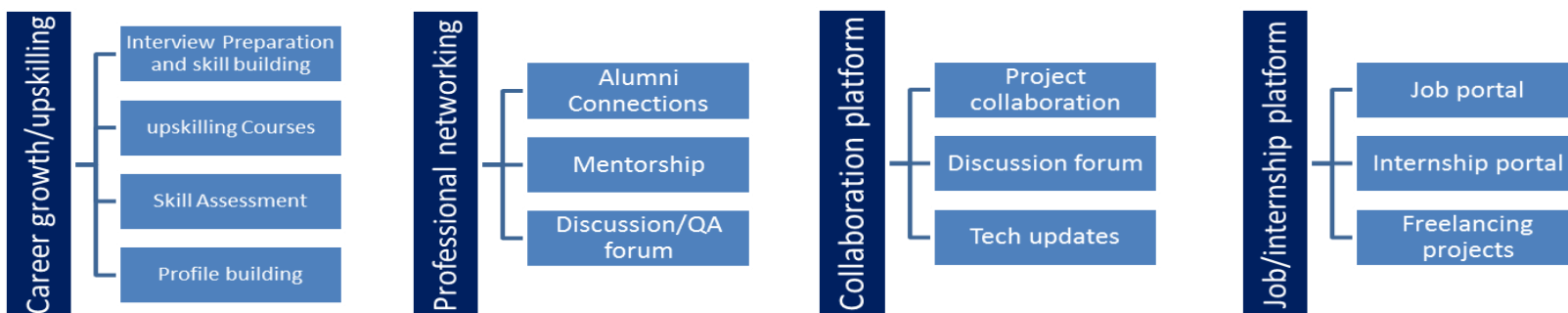


## 2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.





## 2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

## 2.4 Objectives of this Internship program

The objective for this internship program was to

- get practical experience of working in the industry.
- to solve real world problems.
- to have improved job prospects.
- to have Improved understanding of our field and its applications.
- to have Personal growth like better communication and problem solving.

## 2.5 Reference

[1]

[2]

[3]

## 2.6 Glossary

Terms	Acronym

### **3 Problem Statement**

In the assigned problem statement

[Explain your problem statement]

## **4 Existing and Proposed solution**

Provide summary of existing solutions provided by others, what are their limitations?

What is your proposed solution?

What value addition are you planning?

### **4.1 Code submission (Github link)**

### **4.2 Report submission (Github link) : first make placeholder, copy the link.**

## **5 Proposed Design/ Model**

Given more details about design flow of your solution. This is applicable for all domains. DS/ML Students can cover it after they have their algorithm implementation. There is always a start, intermediate stages and then final outcome.

### **5.1 High Level Diagram (if applicable)**

**Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM**

### **5.2 Low Level Diagram (if applicable)**

### **5.3 Interfaces (if applicable)**

Update with Block Diagrams, Data flow, protocols, FLOW Charts, State Machines, Memory Buffer Management.

## **6 Performance Test**

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

Here we need to first find the constraints.

How those constraints were taken care in your design?

What were test results around those constraints?

Constraints can be e.g. memory, MIPS (speed, operations per second), accuracy, durability, power consumption etc.

In case you could not test them, but still you should mention how identified constraints can impact your design, and what are recommendations to handle them.

### **6.1 Test Plan/ Test Cases**

### **6.2 Test Procedure**

### **6.3 Performance Outcome**

## 7 My learnings

You should provide summary of your overall learning and how it would help you in your career growth.



## 8 Future work scope

You can put some ideas that you could not work due to time limitation but can be taken in future.