**Industrial Internship Report on**

**Quality Prediction in a Mining Process**

**Prepared by**

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| *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 Quality Prediction in a Mining Process.  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. |

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# Preface

Over the past six weeks at Uniconverge Technologies, I embarked on an exhilarating journey into the heart of the data-driven world. From understanding the transformative power of Big Data on businesses to unraveling the distinctions between Data Scientists and Data Analysts, I discovered the foundation of modern data insights.

Venturing into Probability and Statistics, I honed the essential skills of a data enthusiast. This foundation paved the way for a deep dive into Machine Learning, where I explored linear functions, optimization techniques, and the fascinating world of different learning types.

Week-5 saw me ascend the success ladder to the corporate world, gaining a clear vision of how to navigate this dynamic realm. I uncovered the potential earnings of a Data Engineer and equipped myself with Data Science interview questions, ready to seize future opportunities.

**About need of relevant Internship in career development:**

Relevant internships are the launchpads of career development. They provide hands-on experience, insights, and networking opportunities that propel me forward in my chosen field. Without them, it's like trying to climb a mountain without proper gear.

**Brief about Your project/problem statement.**

This project aims to predict silica impurity levels in the iron ore concentrate of a mining flotation plant. By providing early information, engineers can optimize the process, reduce waste, and take proactive actions. The project's outcomes will enhance efficiency and sustainability in the mining industry. Exploring real industrial data and help manufacturing plants to be more efficient.

**Opportunity given by USC/UCT:**

USC/UCT provided me with immersive internships, allowing hands-on experience, skill development, industry connections, and a platform to kickstart a promising career journey.

**How Program was planned:**



**Your Learnings and overall experience:**

My internship at USC/UCT has been a profound learning experience. From gaining practical skills and insights into the industry to building a valuable professional network, the opportunity they provided was invaluable. The hands-on experience has deepened my understanding of the field, and the challenges I faced have honed my problem-solving abilities. I'm grateful for the chance to apply classroom knowledge in real-world scenarios, which has boosted my confidence and enthusiasm for my chosen career path. Overall, this internship has been a pivotal step in my development, and I'm excited to take the skills and experiences I've gained here into my future endeavors.

Thanks to all, who have helped me directly or indirectly.

To my juniors and peers, embrace every opportunity, learn from challenges, and nurture your curiosity. Together, we'll shape the future with our passion, determination, and continuous growth. Let's support each other, innovate, and leave our mark on the world. Success awaits, so let's chase it!

# Introduction

## 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.



1. UCT IoT Platform **(****)**

**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

 

1. **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 unleased 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 what 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.

 

1.  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.

1. 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.



## 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.



Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

<https://www.upskillcampus.com/>

upSkill Campus aiming to upskill 1 million learners in next 5 year



## 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.

## 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.

## Reference

[1]

[2]

[3]

## Glossary

|  |  |
| --- | --- |
| Terms | Acronym |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Problem Statement

In the assigned problem statement

[Explain your problem statement]

# 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?

## Code submission (Github link)

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

# 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.

## High Level Diagram (if applicable)

Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

## Low Level Diagram (if applicable)

## Interfaces (if applicable)

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

# 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.

## Test Plan/ Test Cases

## Test Procedure

## Performance Outcome

# My learnings

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

# Future work scope

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