IndustrialInternship Reporton

”Homeautomation system"

Prepared by

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ExecutiveSummary
ThisreportprovidesdetailsoftheIndustrialInternshipprovidedbyUpskillCampusandTheIoTAcademyincollaborationwithIndustrialPartner UniConvergeTechnologies PvtLtd(UCT). **Abstract:** Automatic doors use sensors to open and close the door, so the door opens and closes only when itrecognizes a person. The problem is that the door opens and closes when a person who has nointention of opening the door passes by the automatic door. In this study, we propose an automaticdoor with loose security by using recorded words and poses. By developing an automatic doorcontrol system that only allows people who know the specific words and poses to pass through, wecanmaintain acertainlevel of securityandavoidunnecessary opening and closing motions. ThisinternshipgavemeaverygoodopportunitytogetexposuretoIndustrialproblemsanddesign/implement solutions forthem.Itwasanoverallgreat experiencetohavethisinternship.

TABLEOFCONTENTS

1 Preface

Summaryofthewhole 6 weeks'work.

Week-1:

Studied about Internship Project providing company "UniConverge Technologies Pvt Ltd" ,whichdomainsdoes it work, what kind ofproducts/solutions does it work.

Week-2:

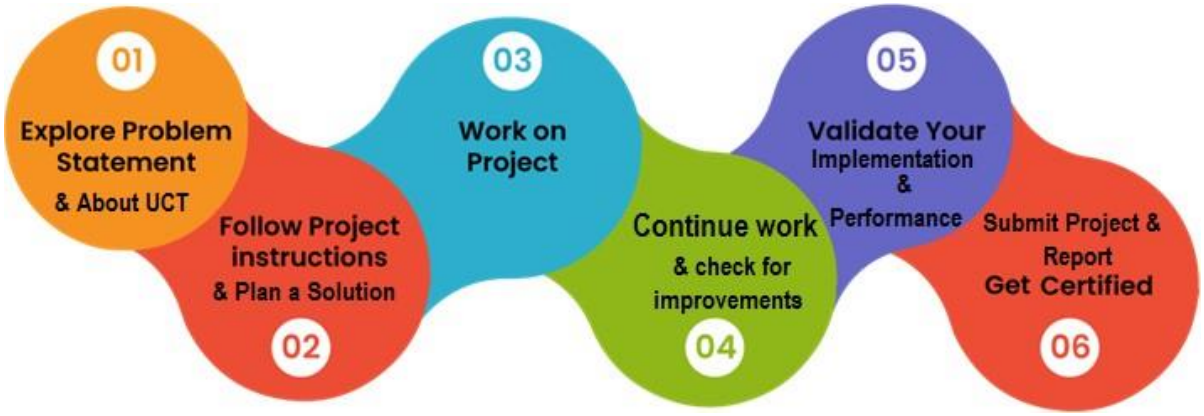
DonecessarystudyandStartworking/designingthesolution correspondingtoyour project.

- Embeddedsystem&IoT
- Python
- CoreJava
- DataScience&MachineLearning
- DigitalMarketing
- 5G
- Drones
- Industry4.0
- ElectricalVehicles
- Cybersecurity

Week-3:Week-4:Week-5:Week-

6ProjectImplementationOpportunit

ygivenby USC/UCT



Thank to allUpskillsTeam,whohavehelpedmedirectlyorindirectly.

2 Introduction

2.1 AboutUniConvergeTechnologiesPvtLtd

A company established in 2013 and working in Digital Transformation domain and providing IndustrialsolutionswithprimefocusonsustainabilityandRoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internetof Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, CommunicationTechnologies(4G/5G/LoraWAN),JavaFullStack,Python,Frontend** etc.

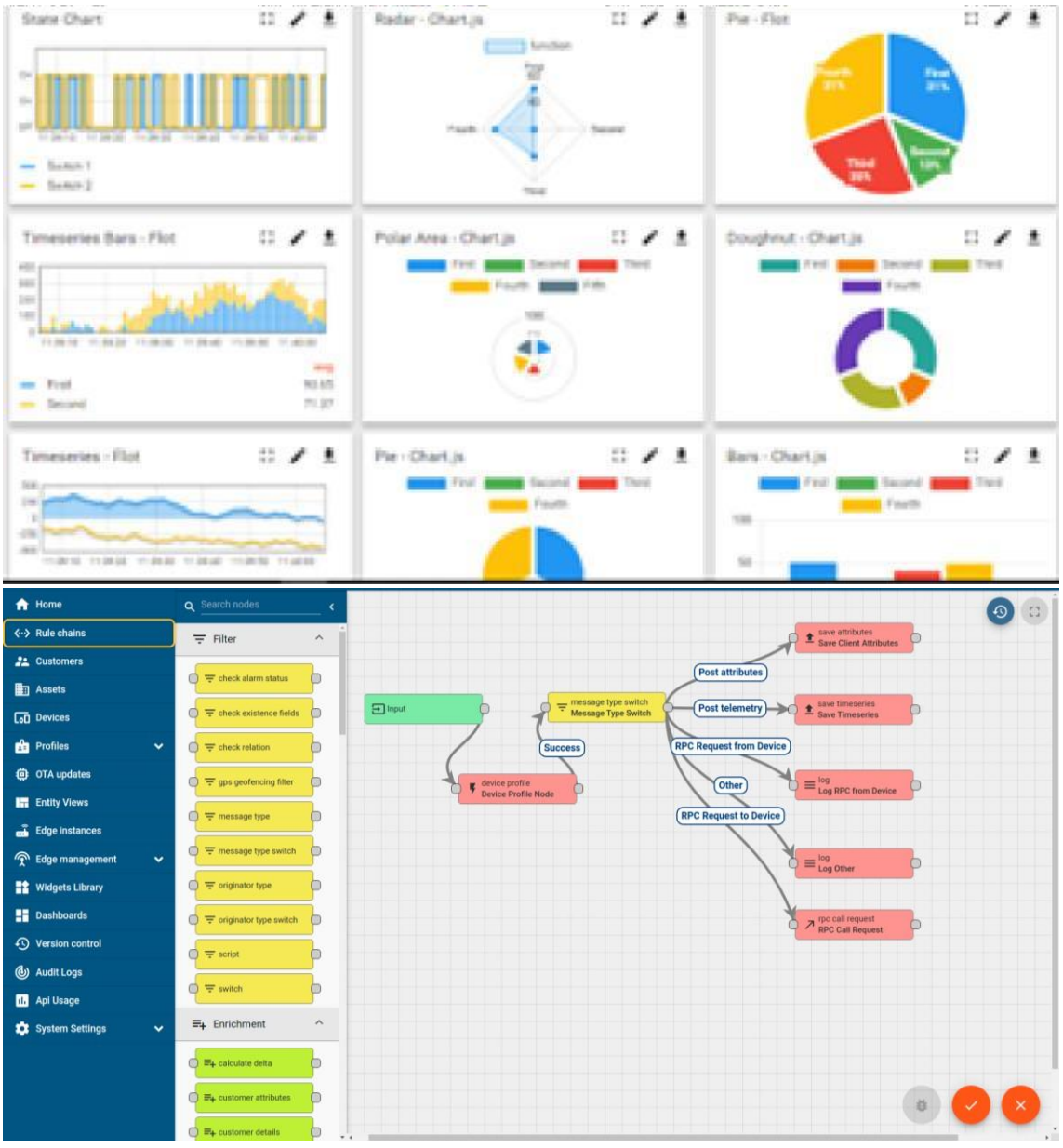
i. UCTIoTPlatform(Insight)

UCTInsightis anIOTplatform designedforquickdeploymentofIOTapplicationsonthe sametime providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJSforFront end.Ithas supportforMySQLandvarious NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, ModbusTCP,OPC UA
- Itsupportsbothcloudandon-premisesdeployments.

Ithas featuresto

- BuildYourowndashboard
- AnalyticsandReporting
- AlertandNotification
- Integrationwiththirdpartyapplication(PowerBI,SAP,ERP)
- RuleEngine



ii. SmartFactory Platform(FACTORY WATCH)

Factory watch is a platform for smart factory

needs.ItprovidesUsers/Factory

- witha scalablesolutionfortheir Productionandassetmonitoring
- OEEandpredictivemaintenancesolutionscalinguptodigitaltwinforyourassets.
- to unleased the true potential of the data that their machines are generating and helps toidentify theKPIs andalsoimprovethem.
- A modular architecture that allows users to choose the service that they what to start and thencanscaletomorecomplexsolutions as pertheirdemands.

Itsunique SaaSmodelhelpsuserstosave time,cost andmoney.

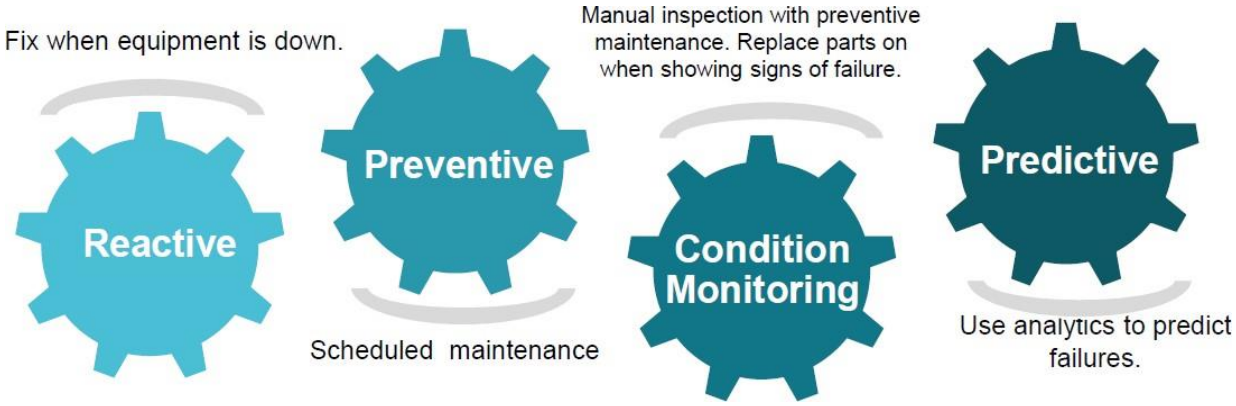
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1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

iii. LoRaWAN basedSolution

UCTis one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smartcities,IndustrialMonitoring,SmartStreetLight,SmartWater/Gas/Electricitymeteringsolutionsetc.

iv. PredictiveMaintenance

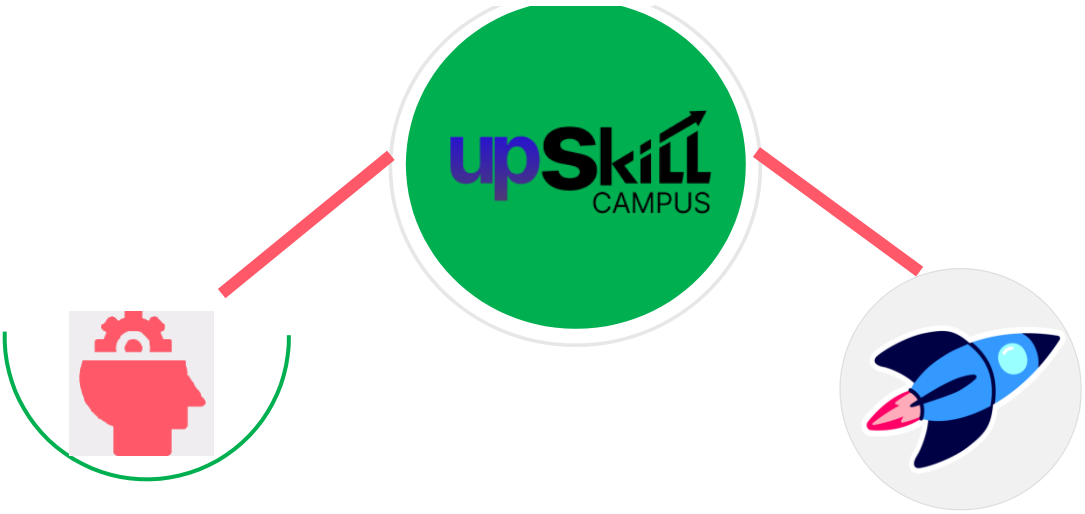
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveragingEmbedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful lifetimeofvariousMachinesused inproductionprocess.



2.2 AboutupskillCampus(USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologieshas facilitatedthe smoothexecutionofthecompleteinternshipprocess.

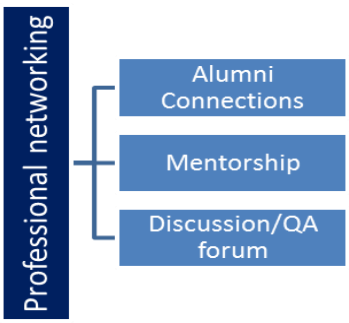
USC is a career development platform that delivers **personalized executive coaching** in amoreaffordable,scalable andmeasurableway.

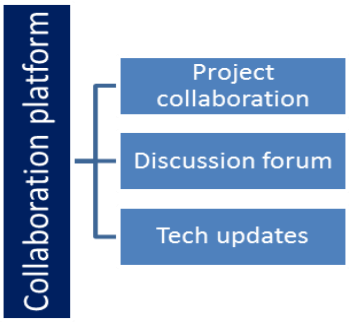


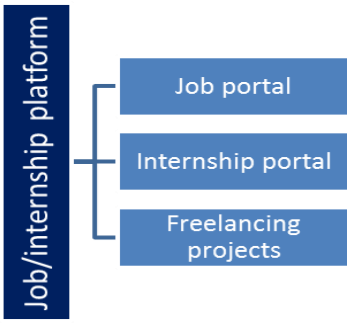
Seeing need of upskilling in selfpaced manner along-withadditional support services e.g.Internship,projects,interactionwithIndustryexperts,Career growthServices

upSkillCampusaimingto upskill 1 millionlearnersinnext 5year

https://www.upskillcampus.com/







2.3 TheIoTAcademy

The IoT academy is EdTech Division of UCT that is running long executive certificationprogramsincollaborationwithEICTAcademy,IITK,IITRand IITGinmultipledomains.

2.4 ObjectivesofthisInternshipprogram

Theobjectivefor thisinternshipprogram was to

- ☛getpractical experienceof workingin theindustry.
- ☛to solvereal worldproblems.
- ☛tohaveimprovedjobprospects.
- ☛tohaveImprovedunderstandingofour fieldand itsapplications.
- ☛to havePersonal growthlikebettercommunication and problemsolving.

2.5 Reference

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2. TakumaNakamura,YuichiMori,andIkukoYairi.2020.Improvementofaccuracyofpostureestimationofsoccershotmotionfromvideo.InProceedingsofthe34thAnnualConferenceoftheJapaneseSocietyfor ArtificialIntelligence.
3. Heejin Cho, Bing Liu, and Krishnan Gowri. 2010. Energy saving impact ofASHRAE90.1vestibulerequirements:Modelingofairinfiltrationthroughdoor openings.PacificNorthwestNationalLab.(PNNL).

ProblemStatement

Introduction:

Abluetoothswichismoderntechnologicalsolutiondesignedtoenhanceconvenience, accessibility, and efficiency in various environments, such as commercial buildings,healthcare facilities, residential spaces, and public spaces. This system employs sensors, motors,and control mechanisms to facilitate the seamless and hands-free operation of switches, eliminatingtheneed formanual effort to open or close them.

The main objectives of abluetoothopening system are to provide ease of access, improveenergy efficiency, enhance security, and create a more inclusive environment for individuals withdisabilities or mobility challenges. This technology finds applications in a wide range of settings,fromretail storesand airports to hospitals and hotels.

Keycomponentsof anautomaticdooropeningsystemtypicallyinclude:

Sensors:Varioustypesofsensors,suchasmotionsensors,infraredsensors,andtouchlesssensors, detect the presence of individuals approaching the switchr. These sensors trigger the switch ropeningmechanism when someoneis within aspecified range.

Actuators: Motors or pneumatic systemsare used as actuators tophysically move the doorpanels. These actuators respond to the signals from the sensors and initiate the switchopening orclosing motion.

Control System: A central control unit or microcontroller manages the communication betweensensors and actuators. It processes the sensor inputs and sends commands to the actuators toensuresmooth and coordinated dooroperation.

Power Supply: The system requires a reliable power source to operate the sensors, actuators, andcontrol unit. Backup power solutions may be integrated to ensure continued functionality duringpoweroutages.

SafetyFeatures: huomautomationsystemsincorporatesafetymechanisms,suchasobstacledetection sensors and safety sensors, to prevent accidents and ensure that the door stopsorreverses its motion if an obstruction isdetected.

User Interface: Some systems include user-friendly interfaces, such as push-button switches ortouchlesspanels, allowingindividuals to manuallyinitiate sitchingwhen necessary.

Benefitsofanautomaticdooropeningsystem:

Convenience: Users can enter or exit a building without the need to physically push or pull switches,makingit particularly useful forthosecarryingitems or pushing strollers.

Accessibility:switchesaremoreinclusive,enablingeasyaccessforpeoplewithdisabilitiesorlimited mobility.

EnergyEfficiency:bluetoothswitchescanhelpregulateindoortemperaturesbyminimizingthetimedo ors areopen, thusimproving energy efficiency.

HygieneandHealth: Inenvironmentswherehygieneiscrucial,touchlesssensorsreducetheneedforindi viduals to touch doorhandles, promoting cleanliness.

Security: Thesesystemscanbeintegratedwithsecurityfeatures,suchasaccesscontrolsystems,tomanag eand monitor entry into restricted areas.

Aesthetics: Automaticdoorsoftenhaveamodernandsleekappearance,enhancingtheaestheticappealof aspace.

ExistingandProposedsolution

Traditional manual switches are the most common type of switchsystem found in various buildings.They require physical effort from users to open and close the switches This solution has been widelyusedformanyyearsandisfamiliar to mostpeople. However,ithas severallimitations:

ManualOperation: Usersneedtophysicallypushorpullthedoortoopenandcloseit,whichcanbe cumbersome, especiallywhencarryingitemsorforindividuals withmobilitychallenges.

Limited Accessibility: Manual doors can be difficult for people with disabilities or those usingmobilityaids to operate, leadingto issues of inclusivityand accessibility.

Energy Inefficiency: Doors may be inadvertently left open, leading to temperature fluctuationsandincreased energy consumption for heating orcooling.

Hygiene Concerns: Manual doors require users to touch door handles, which can be a source ofpotentialgerm transmission, especially in high-traffic areas.

2.6 Codesubmission(GitHublink): https://github.com/SankuGuruPrakash/SankuGuruPrakash/tree/main

2.7 Reportsubmission(Githublink):

3 ProposedDesign/Model

Switchsystempresentsanadvancedsolutionthataddressesthelimitationsoftraditionalmanual switches.This proposed systemoffers numerous benefits:

Convenience: Userscanenterorexitabuildingwithouttheneedforphysicaleffort.Sensorsdetectapproaching individuals and open thedoor automatically.

Accessibility: Automaticdoorsarehighlyaccessible,cateringtopeoplewithdisabilities,seniors,andany onewith mobility challenges.

EnergyEfficiency:bluetoothswitchesshelpregulateindoortemperaturesbyminimizingthetimedoors areopen, leading to reducedenergy consumptionand cost savings.

HygieneandHealth: Touchlesssensorsortouchlessswitchesreducetheneedforuserstophysicallytouch theswitch, promotinghygiene andreducing therisk ofgermtransmission.

Safety:bluetoothsoftenincludesafetyfeatureslikesensorsthatdetectobstacles,preventingthe doorfromclosing on aperson orobject.

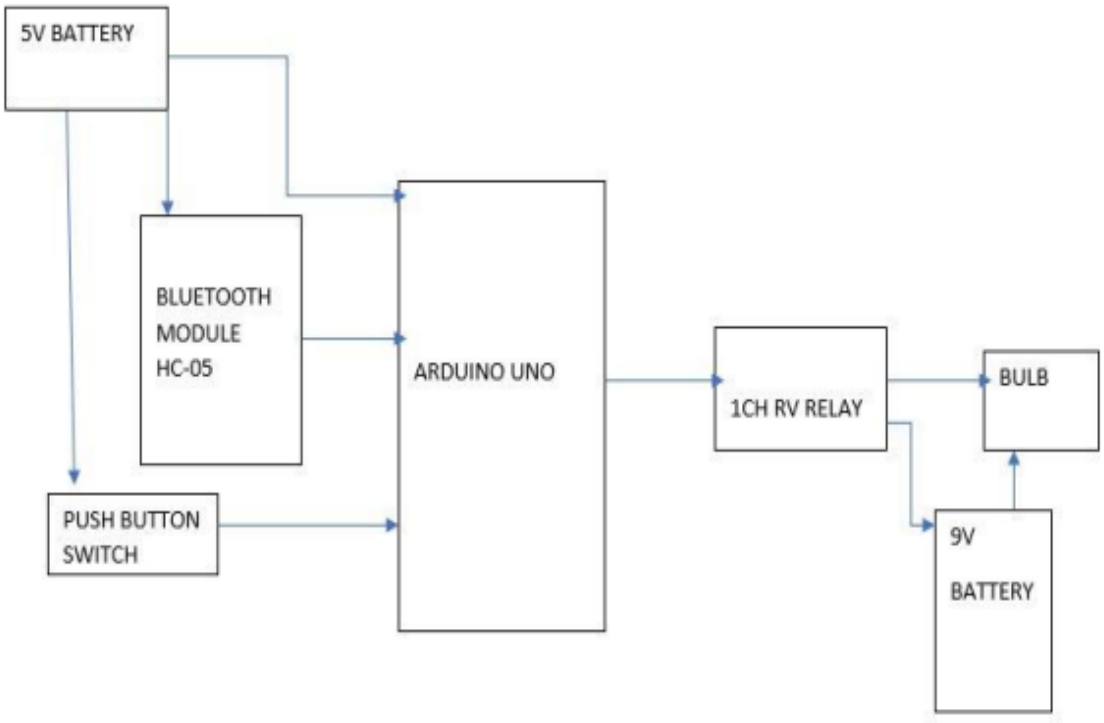
Security: Thesesystemscanbeintegratedwithaccesscontrolsystems,enhancingsecuritybycontrolling who can enter thebuilding and when.

Customization: The speed of switch opening and closing can be adjusted based on the environmentandfoot traffic, ensuringoptimal performance.

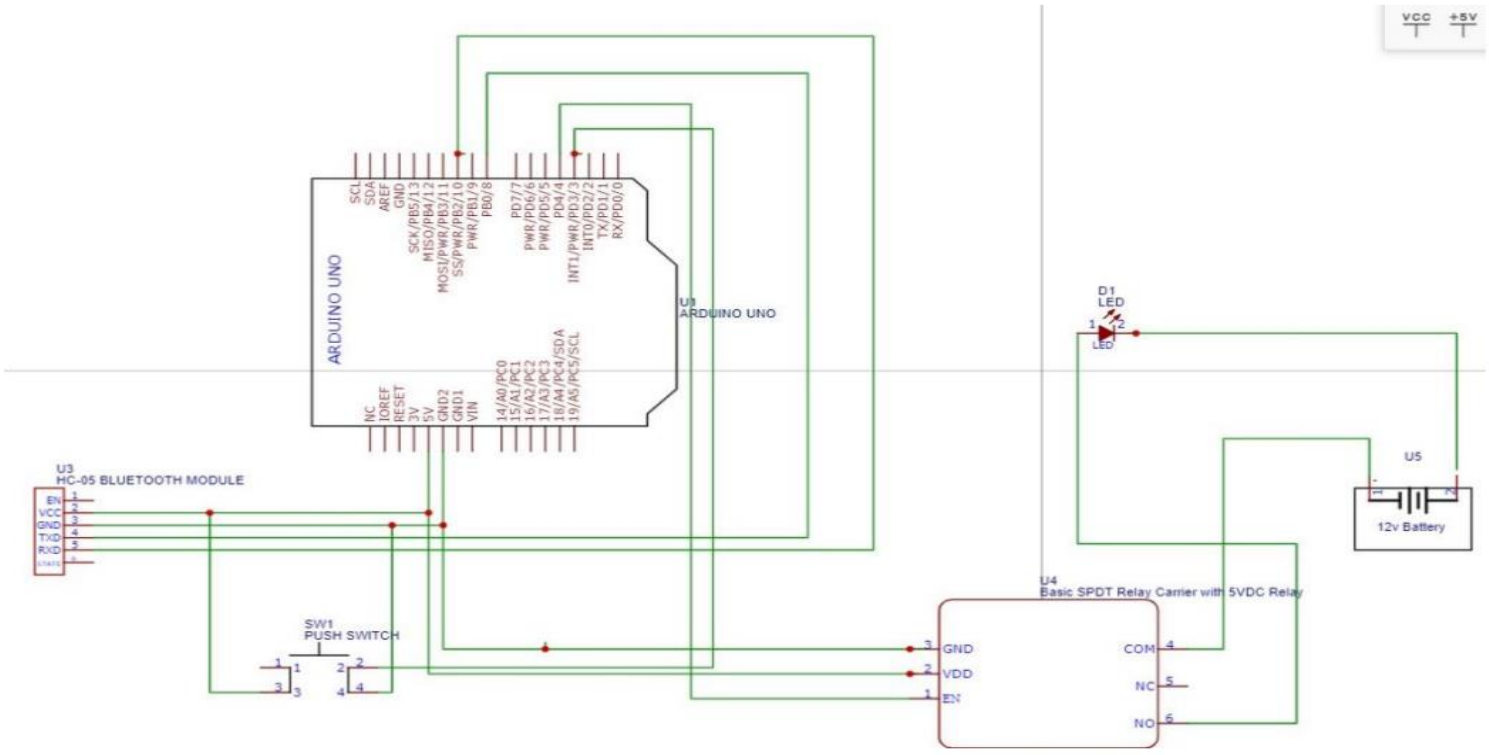
RemoteControl: Someadvancedsystemscanbecontrolledremotely,allowingauthorizedpersonnelto manageswitch operations from a central location.

4 PerformanceTest

3.1 TestProcedure



4.2PerformanceOutcome



4 Mylearnings

TheWorkExperiencesIEncounteredDuringTheInternshipAllowedMeToDevelopIotEmbedded System. I Think I Still Require To Work On My IoT Real Time project. But, TheOverall Experience Was Positive, And Everything I Learned Would Be Useful In My FutureCareer In

This Field.

Conclusion:

The Homeautomaion system has become an integral part of modern infrastructure, findingapplicationsincommercialbuildings,qhealthcarefacilities,hospitalityvenues,publicspaces,and beyond.Astechnologycontinuestoevolve,wecananticipatefurtheradvancementsandrefinements in automatic door systems, leading to even smarter and more sophisticated solutionsthat redefine the way we interact with our surroundings. Overall, the automatic door openingsystem represents a fusion of convenience, technology, and practicality that has a lasting positiveimpacton theway weexperiencephysical spaces.