January 10, 2023

INTERNSHIP CERTIFICATE

This is to certify that **Apurva Kumbhar (ECN: 1176958)** was Intern with Flex Electronics company from January **02, 2023** to Febru**ary 02, 2023.** She was designated as **Junior Engineer - In**tern in **GBS Engineering.**

We wish her all the very best for future.

For and on behalf of

FLEXTRONICS TECHNOLOGIES (INDIA) PRIVATE LIMITED

GLOBAL BUSINESS SERVICES

Sandra Andrews

Sandra Andrews
Human Resources

Mahindra & Mahindra Limited
Plot no -A1, Phase-IV
Chakan MIDC PhaseII,
Taluka-khed, Dist-Pune 410 501
Maharashtra, India

Tel: +91 2135 619842
Fax: +91 2135 617850

www.mahindra.com

Date:11.04.2024
Ref. M&M/ Intern/TL/FTR/15/31109894

To,
Anuradha Ravindra Rawool

Internship

This letter is to certify that **Anuradha Ravindra Rawool (Tokan no.32109894)** has Completed internship with Mahindra & Mahindra Limited as an intern from 05-02-2024 to 08-03-2024.

She has work under the Manufacturing Excellence department. Worked with the managers to improve the performance of Production as well as Logistics team and helped them to certified as Self Management Team. She is very good in problem solving, ability of analytical thinking and hardworking.

We wish her a best luck for future endeavours

Shreyash Acharya
General Manager
(Employee Relation)

EMBROSS

Date: September 3, 2023

Sub: - Internship at Embross Systems Pvt Ltd.

Dear Ashraf,

We hereby inform you that, your internship will be extended with reference to the earlier offer letter dated September 3, 2022.

The extension of Internship will be effective from September 3, 2023, for a period of 11 months commencing immediately and valid till August 2, 2024.

This extension binds and benefits both parties and any successors or assigns. As per the documented earlier Internship agreement dated September 3, 2022.

Your compensation has been increased to Rs.2,90,167/- PA.

All the terms and conditions of the original internship remain unchanged.

For **Embross Systems Private Limited**

EMBROSS SYSTEMS PVT. LTD. PUNE

Authorised Signatory

Embross Systems Private Ltd.

Gat No 17/1, Plot No 1, Near Qualitek Lab, Opp. VW Gate No 2, Nighoje, Pune- 410501

Contact: +91 8007770195 | www.embross.com

Kodacy | SPACE Scientific Platforms And Cosmic Explorations

Certificate
OF INTERNSHIP

This certificate is presented to:

Bhakti Chaudhari

for successfully completing the 30 day virtual internship program on

Electric Vehicle Technology

conducted by KODACY in association with Scientific Platforms And Cosmic Explorations (SPACE).

Date Of Completion: April 27, 2024
Certificate ID: 61c06bf6ed7cc1bd
< Scan this QR to check validity

Authorized Signature
Akash Joseph (CEO)

Kodacy | SPACE Scientific Platforms And Cosmic Explorations

Certificate
OF INTERNSHIP

This certificate is presented to:

Sameer Sonwalkar

for successfully completing the 30 day virtual internship program on

Electric Vehicle Technology

conducted by KODACY in association with Scientific Platforms And Cosmic Explorations (SPACE).

Date Of Completion: April 27, 2024
Certificate ID: 999049c2f47b8970
< Scan this QR to check validity

Authorized Signature
Akash Joseph (CEO)

CLEAN SUSTAINABLE SOLAR ENERGY PRIVATE LIMITED

TO WHOMSOEVER IT MAY CONCERN

This is certified that Mr. Amar Pandit Ekunde studying in Electrical Engineering (6th Semester) at ALARD COLLEGE OF ENGINEERING & MANAGEMENT, Pune. He has undergone training at our organization for 2 months from 01.01.2024 To 29.02.2024.

During the above mentioned training period, the candidate demonstrated his self-motivation skills to learn new skills, hardworking and sincerity.

We wish him all the best in his upcoming career.

From, M/S Clean Sustainable Solar Energy Pvt. Ltd.

01/03/24

Clean Sustainable Solar Energy Pvt. Ltd.

Authorized Signatory

Registered Office:
C/o The Tata Power Company Limited
Corporate Center B, 34 Sant Tukaram Road
Carnac Bunder Mumbai - 400009

CIN: U40300MH2014PTC254371
Tel: +91 22 67171000
Fax: +91 22 67171950

March 29, 2024

ID: 151841

Subject: Internship Completion Letter

Dear Shubham Vishwakarma,

As you have successfully completed your internship period from 1St January 2024 to 31st March. You are hereby relieved of your duties with effect from 31st March 2024.

We hope that the knowledge acquired will help you shape your professional career.

We wish you the best for all your future endeavors.

Sincerely,
For KPIT Technologies Limited,

Shashwat K. Mitra
Global - Head Human Resources

Classification: Public

April 2, 2024.

Ms. MANJUSHA CHANDGUDE
ER&D
IN- Hinjewadi

Re: Completion of Internship

Dear Ms. MANJUSHA, CHANDGUDE,

This is to certify that Manjusha Chandgude was intern with the Tata technologies from January 01, 2024 to March 31, 2024 We are pleased to inform you that consequent to the successful completion of the training period.

We are confident that you will continue your best efforts in the assignments given to you and in the process add value to you and the organization.

We take this opportunity to wish you a long and mutually beneficial career in Tata Technologies.

Best Regards,

Vibhanshu Agnihotri
Global Head - Performance and Rewards

Bajaj Auto Limited,
Akurdi, Pune 411 035, India.
Tel +91 20 27472851
Fax +91 20 27473398
bajajauto.com

HR/00109295

1/04/2024

SAYALI RAJENDRA KHUDE

E&E SYSTEMS (R&D)

Internship Completion Letter

This is certified that Ms. Sayali Rajendra Khude studying in Electrical Engineering (6th Semester) at ALARD COLLEGE OF ENGINEERING & MANAGEMENT, Pune. She has undergone training at our organization for 2 months from 01.01.2024 To 29.02.2024.

During the above mentioned training period, the candidate demonstrated his self-motivation skills to learn new skills, hardworking and sincerity.

We wish her all the best in his upcoming career. We hope that the knowledge acquired will help you shape your professional career. We wish you the best for all your future endeavours!

Best Regards,

MOHAN VAMSHI K

VP (HR) Bajaj
Auto Ltd.

LETTER OF UNDERTAKING FOR STUDY TOUR GIVEN BY STUDENT

Date: 28 /10 /2023

To,
The Principal
ACEM
MARUNJE,
Dear Sir,

Subject: Submission of "Industrial Visit Undertaking"

We the students of III, V and VII -Semester, *Department of Electrical* engineering in ACEM. Herewith voluntarily submitting the under taking.

We are participating in the industrial visit organized by the Institute scheduled on 28 /10 /2023 at NISSAR Transformer Pvt. Ltd. We will be bearing all the expenditure incurred for the industrial visit towards travel and other expenses from our end.

We will ensure you that we will follow all college terms and conditions for industrial visit. We hereby declare and confirm that the college shall not be held responsible in the event of any misfortune or accidents.

We further confirm that the college shall not be held responsible for misconduct or wrongdoing at all times during the period of industrial visit and shall obey the instructions of the faculty members who are accompanying during the industrial visit.

Yours sincerely,

Visit In charge

Prof. Minal Kokare

H.O.D

ALARD College of Engineering and Management
Electrical Engineering Department
Industrial visit to NISSAR Transformers Pvt. Ltd.
A.Y 2022-23 S.E

Date : 28/10/23

Sr. No.	Student Name			
1	BAHIRAT SHRAVANI NITIN			
2	BANDGAR DIKSHA DATTATRAY	P		
3	BHIRUD RIYA NIVRUTTI			
4	BHOLE PURVA KASHINATH			
5	CHAVAN SARTHAK SUNIL			
6	DHONE ASHUTOSH MAHESH			
7	GANGARDE DIGVIJAY SHAHAJI			
8	GHODKE KAMALAKAR MARUTI			
9	GHORVADE VAISHNAVI UTTAM			
10	HANGE JAGANNATH RAMESH			
11	KORE ANIRUDHA PRAKASH			
12	LASHKARE RAJESH KAILAS			
13	PARALE SHRUTI YOGESH			
14	PRANAV LAXMAN SAWANT			
15	SAWANT YASH VIJAYKUMAR			
16	SINGH AMARENDRA PADMAKAR			
17	TAMBOLI SAKHIB SHADULLA			
18	THAWARE SNEHA ANIL			
19	VIKRANT BALASAHEB SHELKE			
20	WAGHMARE GAURAV MARUTI			
21	WANKHADE VINAY SUNILRAO			
22	YADAV ASHUTOSH VINAYAK			
23	TADE VAISHNAVI DAMODHAR	P		
24	WAKADE KETAKI SAMADHAN	P		
25	DABADE YASH PANDURANG			
26	KUDE UTKARSHA SACHIN			
27	SURYAWANSHI VAIBHAV DASHARATH	P		
28	MEHERKAR SHWETA SACHIN			
29	TANMAYI RAJENDRA			
30	RUSHIKESH SANTOSH			
31	KAMBLE BHARATI BALU			
32	GAIKWAD YASH RAJENDRA	P		
33	KADAM SNEHAL SANJAY			
34	SHRIKALA VIJAYKANT			
	Shreeyang	P		

ALARD College of Engineering and Management
Electrical Engineering Department
Industrial visit to NISSAR Transformers Pvt. Lmt.
A.Y 2022-23 T.E
Date : 28/10/23

Sr. No.	Student Name			
1	BUDYE FALAK ASIF			
2	CHANDGUDE MANJUSHA DIPAK	P		
3	CHAUDHARI BHAKTI BABASAHEB	P		
4	CHAVAN MEGHA SHANAKR			
5	GHANWAT PRIYANKA ANANDRAO	P		
6	EKUNDE AMAR PANDIT	P		
7	GIRI RAJ UDAY	P		
8	GIRI YUVRAJ NAGINDRA	P		
9	DHAGE JANARDHAN DATTRAO			
10	GUDIA ROSHAN AUGUSTIN			
11	KHUDE SAYALI RAJENDRA	P		
12	KOLTE PRATHMESH SITARAM	P		
13	KORDE SANJANA SANDIP	P		
14	KUMBHAR APURVA NAVNATH	P		
15	PATEL ASHARAF SALIM	P		
16	PATIL ANUJA RAVINDRA	P		
17	PATIL PRANAV RAMESH	P		
18	PATIL RUTUJA RAJENDRA	P		
19	PAWASKAR PRASAD HARISHCHANDRA			
20	PHADATARE ADESH DATTATRAY	P		
21	RAUT SHUDDHAY SHIVDAS	P		
22	RAWOOL ANURADHA RAVINDRA	P		
23	RUTUJA HOUSHIRAM WALUNJ	P		
24	SAWANT NIRUPAMA DINESH	P		
25	SAYYAD SANIYA BASHIR	P		
26	SAYYED MOHAMMED IRFAN HUSSAIN	P		
27	SHAIKH SOHEL SHARIF	P		
28	SHANTANU SHYAMSUNDAR MUNDE			
29	SONWALKAR SAMEER SUBHASH	P		
30	SRIPAD	P		
31	TARAL AVADHUT NILKANTH	P		
32	THORAT PRAJAKTA SANJAY	P		
33	VAISHNAVI NAMDEV DHAVALE	P		
34	VISHWAKARMA SHUBHAM VINOD	P		

ARD College of Engineering and Management
Electrical Engineering Department
Industrial visit to NISSAR Transformers Pvt. Lmt
A.Y 2022-23 B.E
Date : 28/10/23

Sr. No.	Student Name			
1	AAKASH KUMAR			
2	ANKITA ASHOK JADHAV			
3	ASABE RISHIKESH SAMBHAJI	P		
4	BACHHAV NILIMA ASHOK			
5	BHANDEWAR SANDEEP PANDHARINATH	P		
6	DALAVI ADITYA ANIL			
7	DARDE SANJANA BHAGOJI			
8	DIPARAJ PRABHAKAR PANCHAL			
9	GADEKAR SNEHA SUDHAKAR			
10	GAWAS PRAGATI DNYANESHWAR			
32	GUTTE NANDKISHOR ANANTRAO	P		
11	JADHAV PRACHI MOHAN			
12	JADHAV SANJANA DEELIP			
13	KHAROTE VAISHNAVI GOPAL			
14	KUMBHAR PRAJAKTA DINKAR			
15	KUMBHAR SHUBHANGI SHRISHAIL			
16	MAGARE NIKITA KIRAN			
17	MANDAKE PRATIK JAYAWANT			
19	MANE AYUSH JOTIRAM			
21	MANSI KISHOR RAHATE			
22	MONALI KRUSHNAT CHAVAN			
23	NALABALE SATISH SHIVAJI	P		
24	NIKAM PRATIKSHA RAJENDRA			
25	PAGAR SAYALI SANTOSH			
26	PISAL GURUDAS VASANT			
27	SHINDE SHWETA SANJAY			
28	THORAT PRADNYA SANJAY			
29	UMA VIJAY LOHAR			
30	WALKE PRAJAKTA UTTAM			
31	WALKE RASIKA SANTOSH			
32	YADAV ASHWINI JAGANNATH	P		
33	GORE PRAJWAL GAJANAN			
34	BRAMHANE ANUJ GOPALRAO			
35	YOGESH DAGADU JADHAV			
36	DHORMARE VAIBHAV BAPU			

Alard Charitable Trust's
Alard College of Engineering & Management
(Approved by AICTE, & Affiliated to University of Pune)
We will find a way or we shall make one
CAMPUS : S. No. 50, Marunje, Rajiv Gandhi Infotech Park, Pune - 411 057. Tel.: 020 66523707 / 02
CITY OFFICE : 243, Clover Centre, 2nd Floor, 'D' Wing, 7, Moledina Road, Pune - 411 001 (India)
Tel.: 66013611 / 66013612 / 26121506 Telefax : +91-20-40068058
E-mail : info@alardinstitutes.org Website : www.alardinstitutes.org

Ref.No:-ACEM/Electrical/23-24/93

Date:- 28/10/2023

To,

NISSAR Transformers Pvt. Ltd.

Shirval, Satara

Subject: - Letter of Appreciation

Dear Sir,

I am writing this letter on behalf of ALARD College of Engineering and Management, Marunji to express my sincere gratitude toward NISSAR Transformers Pvt. Ltd. I grab this Opportunity to thanking you for your valuable time spent to guide our all students.

Having been guided on a visit At NISSAR Transformers Pvt. Ltd., I must say that I am thoroughly impressed with your operations and personnel. I don't believe I have ever viewed a more efficient, smooth running and cost efficient programs such as yours. I was particularly impressed with the procedure you have implemented to monitor automation control. All your employees were extremely courteous and went out of their way to explain various functions and answer our inquiries.

Once again I appreciate and thank your efforts taken towards betterment and educating the students at large.

Thank you

HOD Electrical

ACEM, Marunji,

Pune.

ALARD COLLEGE OF ENGINEERING & MANAGEMENT • ALARD CHARITABLE TRUST • PUNE • EN 6325

Visit Completed

PRINCIPAL
Alard Charitable Trust's
Alard College of Engineering
And Management
Marunjee Pune 411057

Alard Charitable Trust's
Alard College of Engineering & Management
(Approved by AICTE, & Affiliated to University of Pune)
We will find a way or we shall make one
CAMPUS : S. No. 50, Marunje, Rajiv Gandhi Infotech Park, Pune - 411 057. Tel.: 020 66523707 / 02
CITY OFFICE : 243, Clover Centre, 2nd Floor, 'D' Wing, 7, Moledina Road, Pune - 411 001 (India)
Tel.: 66013611 / 66013612 / 26121506 Telefax : +91-20-40068058
E-mail : info@alardinstitutes.org Website : www.alardinstitutes.org

Ref. No.:-ACEM/Electrical/22-23/ 92

Date: 18/10/2023

To,
The HR
NISSAR Transformers Pvt. Ltd.
Shirwal, Satara

Sub: - Permission for Visit of our Electrical Engineering Students.

Dear Sir,

Our Engineering College affiliated to University of Pune & approved by AICTE, New Delhi & Govt. of Maharashtra. As per subject mentioned above we are eager to visit the **NISSAR Transformers Pvt. Ltd., Shirwal**. It is recommended in syllabus of Electrical Engineering students for the Subjects of **High Voltage Engineering, Material Science and EIDCBM.**

You will appreciate that the academics need to be supplemented by better Industry-Institution Interaction & this is possible by way of industrial visit. In view of this, we request you to kindly permit our students & staff to visit your esteemed organization, as per your convenience.

Total No. of Students- 68 + 3 Staff

Class- S.E., T.E. & B.E. (Electrical)

Youre Kind, prompt & affirmative reply would be immense help to us.

Thanking You,

Yours Truly,

Prof. N. P. Zinjad

HOD electrical Engg. Dept.

ALARD COLLEGE OF ENGINEERING & MANAGEMENT EN 6325 PUNE

Principal

PRINCIPAL
Alard Charitable Trust's
Alard College of Engineering
And Management
Marunje, Pune -411057

Visit Compiled

Alard Charitable Trust's
Alard College of Engineering & Management
NAAC Accredited
Recognized by AICTE, DTE, Affiliated to Savitribai Phule Pune University
We will find a way or we shall make one
CAMPUS : Alard Knowledge Park : S. No. 50, Marunje, Near Rajiv Gandhi Infotech Park, Phase II, Pune - 411057
Tel.: 020-66523791 / 66523702
E-mail : info@alardinstitutes.com Website : www.alardinstitutes.com
AISHE Code : C-42123 | SPPU-PUN Code : CEGP015030 | DTE Code : 6325

Ref. No.:-ACEM/Electrical/23-24/~~019~~ 4

Date: 2/2/2024

To,
The Superintending Engineer,
HVDC Padghe.

Sub: - Permission for Visit of our Electrical Engineering Students.

Dear Sir,

Our Engineering College affiliated to University of Pune & approved by AICTE, New Delhi & Govt. of Maharashtra. As per subject mentioned above we are eager to visit the **HVDC Substation Padghe.** It is recommended in syllabus of Electrical Engineering students for the Subjects of **Power System-I, Power System-II and Switchgear & Protection.**

You will appreciate that the academics need to be supplemented by better Industry-Institution Interaction & this is possible by way of industrial visit. In view of this, we request you to kindly permit our students & staff to visit your esteemed organization, as per your convenience.

Total No. of Students- 70 + 3 Staff

Class- S.E., T.E. & B.E. (Electrical)

Youre Kind, prompt & affirmative reply would be immense help to us.

Thanking You,

Yours Truly,

Prof. Kavita Shrivastav

HOD Electrical Engg. Dept.

Principal

ALARD COLLEGE OF ENGINEERING & MANAGEMENT * PUNE * EN C325

PRINCIPAL
Alard Charitable Tr
Alard College of En
And Managem
Marunjee Pune

Visited on
Dt: 24/2/2024

Alard Charitable Trust's
Alard College of Engineering & Management
(Approved by AICTE, & Affiliated to University of Pune)
We will find a way or we shall make one
CAMPUS : S. No. 50, Marunje, Rajiv Gandhi Infotech Park, Pune - 411 057. Tel.: 020 66523707 / 02
CITY OFFICE : 243, Clover Centre, 2nd Floor, 'D' Wing, 7, Moledina Road, Pune - 411 001 (India)
Tel.: 66013611 / 66013612 / 26121506 Telefax : +91-20-40066056
E-mail : info@alardinstitutes.org Website : www.alardinstitutes.org

Ref.No:-ACEM/Electrical/23-24/96 Date: - 24/02/2024

To,

Maharashtra State Electricity Transmission

Company Ltd.

HVDC R S O & M Circle, Padgha

Subject: - Letter of Appreciation

Dear Sir,

I am writing this letter on behalf of ALARD College of Engineering and Management, Marunji to express my sincere gratitude toward MSETCL HVDC, Padgha. I grab this Opportunity to thanking you for your valuable time spent to guide our all students.

Having been guided on a visit At MSETCL HVDC, Padgha, I must say that I am thoroughly impressed with your operations and personnel. I don't believe I have ever viewed a more efficient, smooth running and cost efficient programs such as yours. All your employees were extremely courteous and went out of their way to explain various functions and answer our inquiries.

Once again I appreciate and thank your efforts taken towards betterment and educating the students at large.

Thank you

HOD Electrical

ACEM, Marunji,

Pune.

ALARD COLLEGE OF ENGINEERING & MANAGEMENT PUNE EN C325

Head of Department
Electrical Engineering
ALARD COLLEGE OF ENGINEERING & MANAGEMENT, MARUNJI
Sr. No.50, Rajiv Gandhi Infotech Park, Pune-411 057

LETTER OF UNDERTAKING FOR STUDY TOUR GIVEN BY STUDENT

Date: 24 /02 /2024

To,
The Principal
ACEM
MARUNJE,
Dear Sir,

Subject: Submission of "Industrial Visit Undertaking"

We the students of IV, VI and VIII -Semester, Department of Electrical engineering in ACEM. Herewith voluntarily submitting the under taking.

We are participating in the industrial visit organized by the Institute scheduled on 24 /02 /2024 at HVDC, Padgha. We will be bearing all the expenditure incurred for the industrial visit towards travel and other expenses from our end.

We will ensure you that we will follow all college terms and conditions for industrial visit. We hereby declare and confirm that the college shall not be held responsible in the event of any misfortune or accidents.

We further confirm that the college shall not be held responsible for misconduct or wrongdoing at all times during the period of industrial visit and shall obey the instructions of the faculty members who are accompanying during the industrial visit.

Yours sincerely,

Prof. Minal Kokare
Visit In charge

Prof. Kavita Shrivastav
H.O.D. Electrical

Sr. No.	Name of students	Class	Sign
1	KETAKI SAMADHAN WAKADE	SE	
2	Tanmayi Rajendra Kulkarni	SE	
3	Rushikesh Santosh Mahajan	SE	
4	Snehal kadam	SE	
5	Yash Dabade	SE	
6	Utkarsha khude	SE	
7	Vaibhav Suryawanshi	SE	
8	Bharati Balu Kamble	SE	
9	Shweta Sachin Meherkar	SE	
10	Vaishnavi Tade	SE	
11	SRIPAD	SE	
12	Gurav Shrikala Vijaykant	SE	
13	Sneha Thaware	SE	
14	Vinay Sunil wankhade	SE	
15	Diksha Bandgar	SE	
16	Purva bhole	SE	
17	Digvijay Shahaji Gangarde	SE	
18	Riya Nivruti Bhirud	SE	
19	Sarthak Chavan	SE	
20	Shruti Parale	SE	
21	Pranav laxman sawant	SE	
22	Shuddhay shivdas raut	TE	
23	Sameer S. Sonwalkar	TE	
24	Avadhut Taral	TE	
25	Adesh phadatare	TE	
26	Sayali Khude	TE	
27	Priyanka Ghanwat	TE	
28	Prathmesh S Kolte	TE	
29	Sohel Sharif Shaikh	TE	
30	Sanjana korde	TE	
31	Raj Uday Giri	TE	
32	Amar Pandit Ekunde	TE	
33	Rutuja Rajendra Patil	TE	
34	Apurva Navnath Kumbhar	TE	
35	Rutuja walunj	TE	
36	Manjusha Dipak Chandgude	TE	
37	Shubham Vishwakarma	TE	
38	Sayyed Mohammed Irfan Hussain	TE	

24/02/2024

39	Patil Pranav Ramesh	TE	
40	Chaudhari Bhakti Babasaheb	TE	
41	Falak Asif Budye	TE	
42	Saniya Bashir Sayyad	TE	
43	Asharaf Salim Patel	TE	
44	Prajakta Sanjay Thorat	TE	
45	Nirupama Sawant	TE	
46	Rishikesh Sambhaji Asabe	BE	
47	Monali krushnat chavan	BE	
48	Prajakta Uttam Walke	BE	
49	Rasika santosh walke	BE	
50	Sandeep bhandewar	BE	
51	Pradnya Sanjay Thorat	BE	
52	Nalabale Satish Shivaji	BE	
53	Sanjana Bhagoji Darde	BE	
54	Sayali Santosh pagar	BE	
55	Yadav Ashwini Jagannath	BE	
56	Prachi Mohan Jadhav	BE	
57	Shweta Sanjay Shinde	BE	
58	Prajwal Gore	BE	
59	Pragati Dnyaneshwar gawas	BE	
60	Nandkishor gutte	BE	
61	Sneha Sudhakar Gadekar	BE	
62	Sanjana Dilip Jadhav	BE	
63	Nikita Kiran Magare	BE	

64 Ankita Ashok Jadhav BE

Sr. No.	Name of Faculty	Sign
1	Minal Kokare	
~~2~~	~~Kalyani Salunkhe~~	
3	Archana Babaleshwar	
4	Anital Kher	
5	Pallavi Sarode	

56.

Savitribai Phule Pune University

Alard College of Engineering and Management

Oct/Nov 2023-24 OR/PR/TW EXAMINATION

ATTENDANCE REPORT- PBL (Termwork).

Center : ACEM (4070) Day:

Branch : APPLIED SCIENCE Date: 30/05/24.

Subject Name: Project Based Learning. Min .Marks 13

Name of Internal Prof. R. A. Deshmukh. SEM-II

Maximum Marks - 25

Sr. No.	Seat No	Exam Seat No	Name of Student	Regular / Backlog	Marks obtained	Sign of Students
1	FE_2019_A29	F190700003	BIRADAR ABHISHEK ANIL	R	19	
2	FE_2019_A1	F190700005	ADE BALAJI SUBHASH	R	15	
3	FE_2019_A2	F190700006	ADE SUJAL RAJESH	R	20	
4	FE_2019_A3	F190700009	AGASIMANI RAJAMA CHINAGIBADASHAHA	R	22	
5	FE_2019_A4	F190700010	AGHAV AKANKSHA BANDU	R	21	
6	FE_2019_A5	F190700013	AMBURE KESHAV BHARATRAO	R	21	
7	FE_2019_A6	F190700015	ARBAT RUTVIK DURVAS	R	15	
8	FE_2019_A7	F190700016	ASGAONKAR SOHAM SAJJAN	R	21	
9	FE_2019_A27	F190700019	BHOSALE AVADHUT SAMBHAJI	R	15	
10	FE_2019_A9	F190700021	AWGHADE PRIYA PRAKASH	R	20	
11	FE_2019_A10	F190700023	BADE VAISHNAVI RAJESH	R	21	
12	FE_2019_A12	F190700024	BALWADKAR BHAKTI MACHINDRA	R	22	
13	FE_2019_A13	F190700025	BAND PRAGATI DINESH	R	21	
14	FE_2019_A15	F190700026	BARDE SHEFALI MADHUKAR	R	21	
15	FE_2019_A17	F190700027	BARMADE UDAYRAJE BALAJI	R	22	
16	FE_2019_A18	F190700028	BAROTE NIYAMAT HANNANPASHA	R	20	
17	FE_2019_A19	F190700029	BAWAGE VIJAY PRADEEP	R	15	
18	FE_2019_A20	F190700030	BEMBALKAR OM SATISH	R	13	
19	FE_2019_A21	F190700032	BERAD VAIBHAV VIKAS	R	13	
20	FE_2019_A22	F190700033	BHADKE GAURAV SUNIL	R	15	
21	FE_2019_A25	F190700037	BHAWARE SAMYAK DIPAK	R	17	
22	FE_2019_A26	F190700038	BHOKNAL PURVA RAJENDRA	R	18	
23	FE_2019_A28	F190700040	BHUJBAL RUSHIKESH RAMAKANT	R	18	
24	FE_2019_A30	F190700042	BOKADE RISHIKESH ANIL	R	15	
25	FE_2019_A31	F190700043	BORADE PRADYUAMN VASANT	R	16	
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60	FE_2019_A23	F190700288	BHALERAO PRADEEP SHANKAR	R	16	
61	FE_2019_A60	F190700313	DHAWALE ROHAN RAJENDRA	R	13	
62	FE_2019_A24	F190700331	BHAMERE SAURAV SANDEEP	R	17	
63	FE_2019_A11	F190700340	BAGWAN SHAHID ASHPAK	R	20	
64	FE_2019_A56	F190700383	DESHMUKH SUSHMA DIGAMBAR	R	19	
65	FE_2019_A14		BARDE SALONI RAMESHWAR	R		
66	FE_2019_A16		BARDE SHREYA BASWESHWAR	R		
67	FE_2019_A8		ATAPADKAR ROHAN SUBHASH	R		

Total Number of Students :

Total Number of Students Present :

Total Number of Students Absent : —

Total Number of Students Pass : All

Total Number of Students Fail : —

Name of Examiner :

Prof. R.A. Deshmukh

Sign of Sr. Supervisor

Alard Charitable Trust's

Alard College of Engineering and

Management,

Pune 411057

(Academic year 2023-2024)

DEPARTMENT OF APPLIED SCIENCE

CERTIFICATE

This is to certify that MISS CHASKAR SNEHA DATTATRAY, the class of FE CLASS having Roll No. F190700051 has Project Base learning entitled "MOTION DETECTION SENSOR in partial fulfilment of the syllabus of first year applied science Examination as prescribed by Savitribai Phule Pune University, Pune. For academic year 2023-2024(SEM-II)

Dr. Padma Zade

(Project Guide)

Dr.K.D.Sapate

(Principal)

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ALARD COLLEGE OF ENGINEERING
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MOTION DETECTION SENSOR

ACKNOWLEDGMENT

I am honered to express my deep sense of gratitude towards my guide name Prof. PADMA ZADE MAM department of applied science for his creative suggestions, helpful discussion, unfailing advice, constant encouragement during the seminar work.

I consider myself privileged to have worked under her, as she always shared his vast experience so generously and patiently in spite of his busy schedule . I sincerely appreciate the interactive help, received from her by the way of advice, suggestion.

At the outset I take this opportunity to express my sincere gratitude to prof. PADMA ZADE MAM

and Principal sir for giving me an opportunity to pursue my studies for the for the present work.

Date –

Place –

ABSTRACT

This project contains the model of a PIR motion sensor which is used at places where a moving living object detection is required. It allows us to detect the presence of a people, animals when they are located in the range of the sensor. It is less complex, feasible to purchase, is a low power device and reliable i.e. it does not wear out soon and hence it is used in many gadgets and appliances. It is abbreviated as a "Pyroelectric or Passive Infrared Sensor". These are widely used in smart systems where a system has to respond automatically in the presence of a person such as in staircases, rooms, street lights, etc and turns them off in their absence due to which there is reduction in the consumption of energy and also a person need not mechanically perform the task thus reducing the monotonous work.

INTRODUCTION

A motion detector is a device that detects moving objects especially people. It is often integrated as a component of a smart system to receive alerts. It contains a Pyroelectric sensor which is an optical sensor that senses the moving object through emission or reflection of infrared rays. It is sensitive to a person's skin temperature through emitted black body radiation at mid-infrared wavelengths, in contrast to background objects at room temperature. PIR Sensors have a 3 pin circuit, one is the ground pin, other is the supply voltage pin generally 5V and the third pin is the output signal pin. The PIR sensor board results in a digital output which we recognize as a pin having a flip from low to high or high to low. It is difficult to differentiate between different energy emitting bodies like humans, animals, moving objects, heat emitting bodies, etc. Thus a potentiometer is generally used to tune the frequency of the input system to that of the emitting source to be selective. Once the moving body is out of the range of the detection of the sensor, it results in a low signal indicating the absence and thus system goes to a stand by state waiting for an input radiation.

REQUIREMENTS

Materials Requires –

- PIR Sensor Module
- Arduino UNO
- LED
- Buzzer
- Breadboard
- Connecting Wire
- 330 ohm resistor
- Battery - 9 volt

CONSTRUCTION

The PIR sensor consists of a pyro electric element which generates a signal when exposed to heat or temperature variation. It contains a special lens called Fresnel lens which sets the range and sensitivity of the sensor. It helps in converging the detected infrared signals to the pyroelectric element. To make the signal usable by the appliances, it has to be amplified to a dc level of atleast 5v which is done using a 2 stage amplifier and a comparator circuit.

The amplifier and comparator circuit was designed to get low power output to avoid high power dissipation.

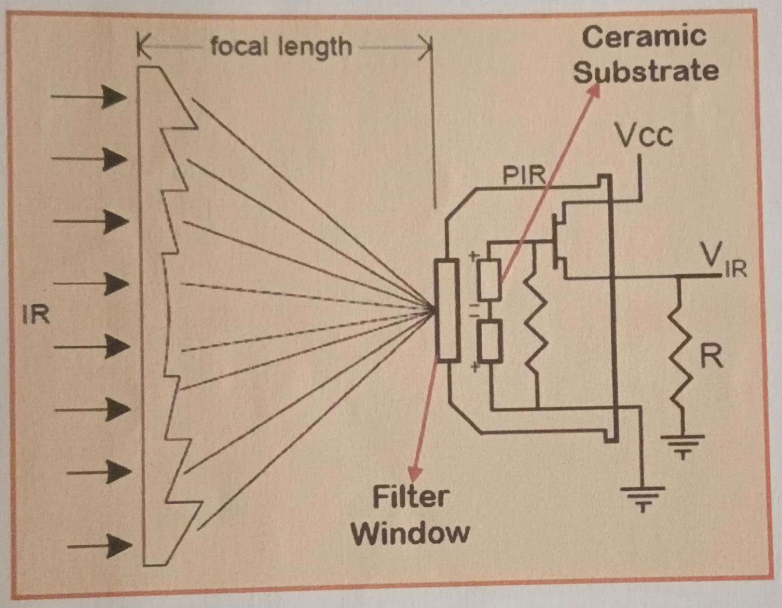
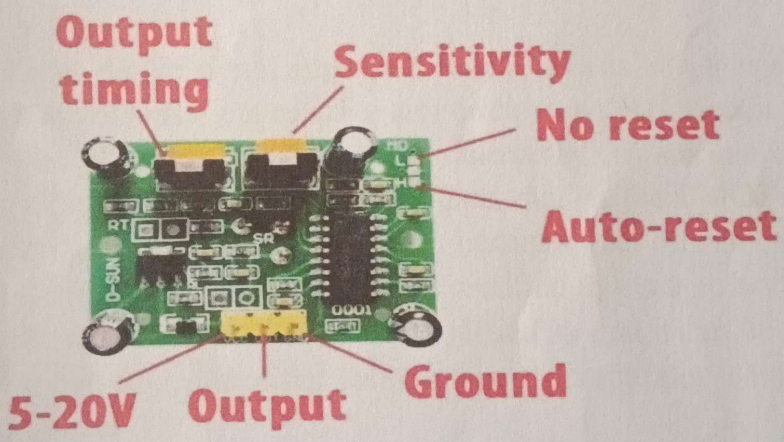


Figure 1: A generalised PIR sensor design The Fresnel lens condenses light, providing a larger range of IR to the sensor. To increase the range of action of the PIR sensor, the lens is split into multiple sections each section of which is a fresnel lens. The lens can change the breadth, range, sensing pattern, very easily. low power devices, we have constructed delay circuits using flip flops of CMOS technology.

Circuit Diagram and Explanation

The circuit Diagram for arduino motion detector project by interfacing Arduino with PIR module and blinking an LED/Buzzer is shown in the below image. We have powered the PIR sensor using he 5V Rail of the Arduino. The output pin of the PIR Sensor is connected to the 2nd digital pin of Arduino. This pin will be the INPUT pin for Arduino. Then the 3rd pin of Arduino is connected to the LED and Buzzer. This pin will act as the output pin of the Arduino. We will program the Arduino to trigger an Output on 3rd pin if an Input has been detected at 2nd pin. The complete Program is explained below.



WORKING OF A PIR SENSOR

Any object be it living or non-living emits radiations due to its heat. In case of humans or animals, IR radiations are emitted because of body heat. The Fresnel lens captures these rays and focuses them onto the pyroelectric element as shown in figure 3. The infrared rays from the person are focused at the sensing element and thus detected.

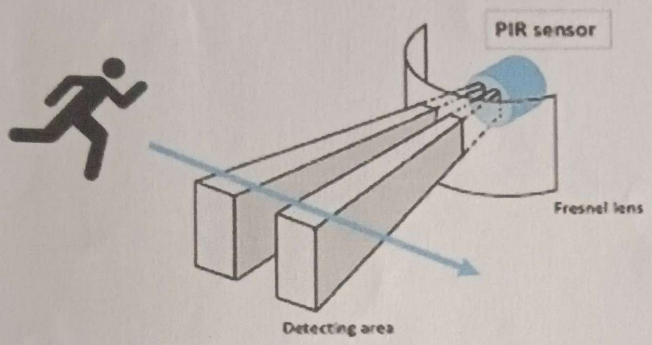
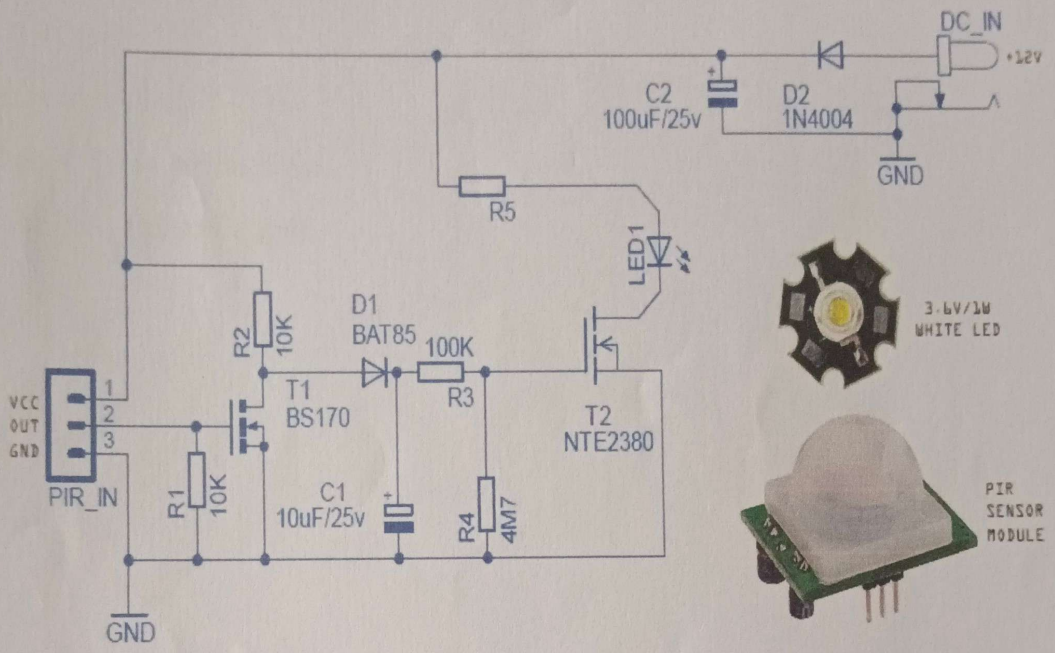


Figure 2: Fresnel lens As the signal amplified is available as a trigger only for a short period which is not sufficient to drive any circuits, a delay circuit was constructed which helps in rectifying the same. The delay circuits can be constructed using a duty cycle controller, flip-flops, etc. As the CMOS devices are The sensing element thus produces a analog output signal on detection of a heat source movement. This signal is full wave rectified to get a pulse. This pulse is of very few volts and thus has to be amplified so that it can be used elsewhere. Hence a two stage amplifier followed by a comparator is used to get appropriate voltage level .

The output analog waveform on full wave rectification gives a pulse which is given to an amplifier and a comparator to get a digital output with immunity to noise. This digital sensor output is on only for a certain amount of time, and re triggering is required to get consistent output. And thus a delay circuit is built using flip-flops.

Flow chart



FEATURES OF A PIR SENSOR

1. Motion Detection.
2. Low Noise.
3. Supply Voltage - 5V.
4. Delay Time Adjustable.
5. Standard Pulse Output.

DISADVANTAGES

1) Limited range
2) poor line of sight
3) PIR sensor pot should be adjusted in such a way to detect the humans only.

APPLICATIONS

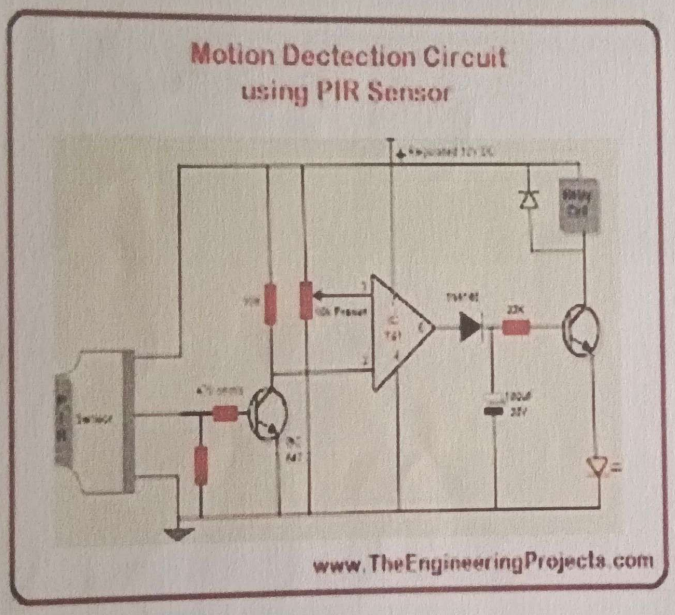
1) Street lights

2) Security system

3) Automatic door opening

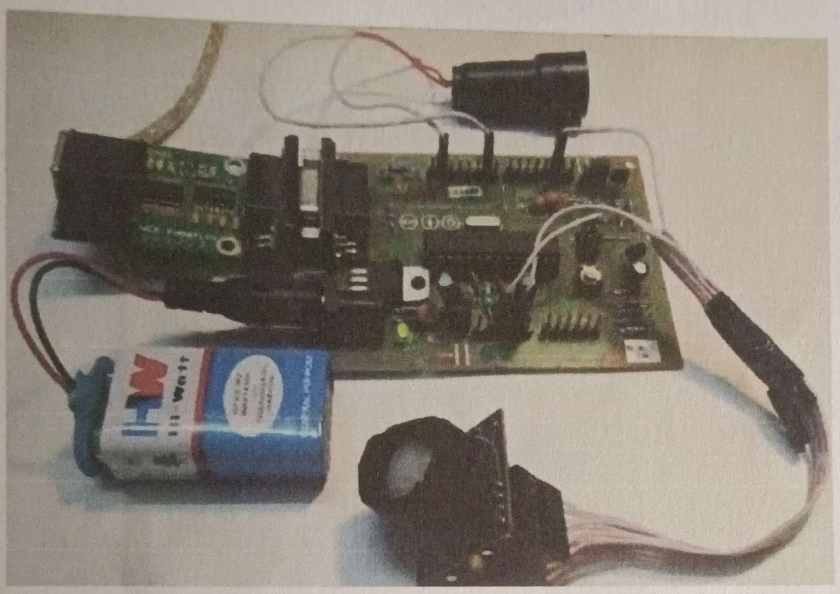
4) Any power saver circuits

The applications of the PIR sensor are based on the requirement of the system, such that the energy is not wasted and the system is automated without human intervention. The system is thus designed with low power, cost reliability and exhibits more immunity to noise. Figure 6: Amplifier and comparator circuit.



RESULT

The result show the final hardware design of the purposed system. This result clearly show how all the components required for our system is connected.



CONCLUSION

Hereby we come to an end of project Motion Detector Using PIR sensor. This project give us an idea to detect the motion. This project can be used anywhere either at home or office. This is also cost efficient does by this attempt of ours circuit can be used as protecting device and can be used for security also. It can be used as kind of antitheft device. It is very much cost efficient can be easily and efficiently.

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