

INTERNSHIP REPORT
ON
MACHINE DESIGNER INTERN

Submitted to MAHARAJA RANJIT SINGH PUNJAB TECHNICAL
UNIVERSITY in
partial fulfillment of the requirement for the award of the degree of

B. TECH

in

COMPUTER SCIENCE & ENGINEERING

Submitted By

Ashutosh Joshi

200280039



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

GIANI ZAIL SINGH CAMPUS COLLEGE OF ENGINEERING & TECHNOLOGY,
MRSPTU, BATHINDA-151001

JAN - MAY 2024

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PREFACE

This record is concerned about our internship during the 8th semester of our B.Tech.

It is with great pleasure and a sense of accomplishment that I present this internship report, marking the culmination of my tenure as a Machine Designer Intern at Harkaram Industries. Over the course of Jan to May 2024, I have had the privilege of immersing myself in the dynamic world of machine design, where every day presented new challenges and opportunities for growth.

My journey at Harkaram Industries has been nothing short of transformative. From the outset, I was warmly welcomed into a team of dedicated professionals who epitomize excellence in their craft. Their guidance, support, and mentorship have been invaluable as I navigated the intricacies of machine design, learning not only the technical aspects but also the importance of collaboration, innovation, and attention to detail.

During my time here, I had the opportunity to work on a range of projects, each more exhilarating than the last. From conceptualization to execution, I was involved in every stage of the design process, gaining hands-on experience and insights that are simply unparalleled. These projects were not just assignments; they were opportunities to push boundaries, explore new ideas, and contribute meaningfully to the company's objectives..

Ashutosh Joshi

ACKNOWLEDGEMENT

I express my sincere gratitude to **Er. Jyoti Rani** (worthy HOD), **Er. Simardeep Kaur** and **Dr. Swati Jindal** (2020 Batch Advisors), for providing me an opportunity to undergo internship at Harkaram Industries.

It I would like to express my heartfelt gratitude to **Mr. Karamjeet Singh**, my esteemed internship in-charge and **Mr. Indervir Singh** (Proprietor Harkaram Industries) whose unwavering support, guidance, and mentorship have been instrumental in shaping my internship journey. His wealth of knowledge, patience, and encouragement have not only facilitated my professional growth but also inspired me to strive for excellence in every endeavor.

I am immensely grateful to my colleagues at Harkaram Industries, whose camaraderie, collaboration, and camaraderie have made my internship experience truly memorable. Their willingness to share insights, lend a helping hand, and engage in meaningful discussions have enriched my learning and fostered a sense of belonging within the team.

A special mention goes to the Research and Development (R&D) team, whose dedication to innovation and excellence has been a constant source of inspiration. Working alongside such talented individuals has not only broadened my horizons but also instilled in me a deep appreciation for the transformative power of collective effort and collaboration.

I would also like to extend my gratitude to all the individuals at Harkaram Industries who have contributed in various capacities to make my internship experience fulfilling and enriching. Your support, encouragement, and constructive feedback have played a pivotal role in shaping my professional journey, and for that, I am truly thankful.

Ashutosh Joshi

CANDIDATE’S DECLARATION

I, **ASHUTOSH JOSHI** Roll No. **200280039** of B.Tech (Semester- VIII) of the **Giani Zail Singh Campus College of Engineering & Technology, Bathinda** hereby declare that the Internship Report entitled “**MACHINE DESIGNER INTERN AT HARKARAM INDUSTRIES**” is an original work and data provided in the study is authentic to the best of my knowledge.

This report has not been submitted to any other Institute for the award of any other degree.

Ashutosh Joshi

Place: GZSCCET, MRSPTU,

BTI Date: / /2024

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INTRODUCTION



Harkaram Industries is established in the year 2002 with the extreme efforts of S. Inderveer Singh Mankoo and his father Karamjit Singh Mankoo.

We "Harkaram Industries", are one of the leading manufacturer and supplier of Industrial Special Purpose Machines like Hydraulic & Pneumatic Machinery, CNC Turning Centre, Multi Drilling Machines etc. We are one of the most reckoned Auto Copying Machine manufacturers in Punjab. Our business operations are led by experienced management that guides us in perfectly understanding as well as meeting the specific work process requirements arising at customer's end. We are equipped with the state of the art machineries, equipments and skilled man power to promptly handle the specific requirements of the customer. Our technical team is good enough to understand the needs of the clients and deliver the products & services with utmost quality, timely and dignity.

- **Consistent Approach**

Today, our consistent approach in providing world class services from conceptualization to realization of Process Automation projects in the Industrial & Commercial sectors assist us in successfully catering to the specific process needs of customers based in the Indian & Asian markets. Our core strength has always remained our people, a team of dynamic, result oriented, and highly skilled professionals who have with them both local and international experience. Added process support provided by Research team also assist us in ensuring each of the solution delivered and project handled from our end matches up to the exact specifications as demanded by the customers.

- **Products Range**

Harkaram Industries are catering to the needs of different industries with our qualitative range of Special Purpose Machine, manufactured as per client's specific requirement. All our SPMs are engineered to deliver optimum performance and consistently high output. Made using superior quality raw material and proven manufacturing / fabrication techniques our range is known for

precise dimension, durability, high performance, energy efficiency and low maintenance. Our products range includes CNC Turning Centre, Multi Drilling Machine, Auto Lath Machine, Auto Turning & Threading Machine, Hydraulic Copying Attachment, Auto Loader Drilling Machine, Two Station Drilling Machine, Horizontal Drill SPM Machine, SPM Fan Shaft Drill Machine etc. We also provide other services like Machinery Bed Hardening and Induction Hardening Job Works.

- **Our Strength**

A team of qualified, dedicated engineers assists us right from designing up to the accomplishment of the SPM Machines project. Our highly skilled technicians are capable of delivering high accuracy machine components. Harkaram Industries has a full fledge tool room equipped with the variety of conventional machines and latest technology. We have all necessary inspection facilities required to check machined parts. Our engineers are well versed to deliver high quality machining and the ability of achieving the accuracy.

- **Capabilities**

Harkaram Industries offer end-to-end solutions to its customers that go well beyond just supply of parts- starting at design and development stage, right through to supply of complete assemblies meeting customer's quality and delivery requirements. Our strong engineering team uses latest CAD design and simulation techniques for design and feasibility analysis of parts, especially hydroformed parts, and also tools, fixtures and gauges.

- **Machine Shop**

Our state-of-the-art machine shop with latest CNC machining facilities produces the tools, dies and necessary equipment with high-class accuracy and finish. Our production and quality team is well versed and trained to ensure that manufactured machines are meeting International Standard Quality requirements.

INTERNSHIP OBJECTIVES AND DESCRIPTION OF WORK

During my tenure as a Machine Designer Intern at Harkaram Industries, my primary objective was to gain hands-on experience and deepen my understanding of machine design principles while contributing to the company's objectives in various capacities. The key objectives of my internship were as follows:

1. Machine Designing:

To engage in the design process of various machines, ranging from conceptualization to implementation, while adhering to industry standards and best practices. This involved utilizing CAD software to create detailed designs, conducting feasibility studies, and collaborating with cross-functional teams to ensure the successful execution of design projects.

2. Implementing and Experimenting with Automation:

To explore the integration of automation technologies into existing machines, with the aim of enhancing efficiency, productivity, and reliability. This involved researching emerging automation trends, identifying opportunities for automation within the company's processes, and actively participating in the implementation and experimentation phases.

3. Building Prototypes:

To participate in the development and fabrication of prototypes for new machine designs or enhancements. This involved translating design concepts into physical prototypes, sourcing materials, and components, and conducting rigorous testing and iteration to refine the prototype's functionality and performance.

4. Analyzing and Optimizing Machinery:

To analyze the performance of existing machinery, identify areas for improvement, and implement optimization strategies to enhance efficiency, reliability, and performance. This involved conducting thorough performance evaluations, gathering and analyzing data, and collaborating with engineering teams to implement improvements and enhancements.

5. Website Management:

To assist in managing the company's website, ensuring that it accurately reflects the company's products, services, and capabilities. This involved updating content, images, and other multimedia elements, optimizing the website for search engine visibility, and implementing any necessary improvements or enhancements to enhance user experience and engagement.

6. Conclusion:

Overall, my internship objectives at Harkaram Industries were centered around gaining practical experience in machine design, automation, prototype development, machinery analysis, optimization, and website management, while actively contributing to the company's objectives and projects in these areas. Through hands-on projects, collaboration with colleagues, and exposure to real-world challenges, I aimed to develop valuable skills and insights that would prepare me for a successful career in the field of machine design and automation.

7. Add On:

I would like to add on some points after conclusion that CAD softwares are little bit complex to understand and use, but I found some old and traditional way to get optimized prototype design using PVC pipes. PVC pipes has plasticity that means it can be deformed easily at high temperature, enough temperature which a Heat Gun can produce. So, through heat and cutter I was easily cut, create and add different parts with each other respectively.

SKILLS AND KNOWLEDGE ACQUIRED

During my internship at Harkaram Industries as a Machine Designer Intern, I had the opportunity to acquire a diverse range of skills and knowledge that have significantly enriched my professional development. Some of the key skills and knowledge gained include:

1. Machine Designing :

Through hands-on experience and mentorship from seasoned professionals, I developed a comprehensive understanding of machine design principles, including mechanical design, structural analysis, and component selection.

2. Prototype Development:

I honed my skills in prototype development, from conceptualization to fabrication and testing. I learned how to translate design concepts into physical prototypes, select appropriate materials and components, and conduct rigorous testing and iteration to refine prototype functionality and performance.

3. Machinery Analysis and Optimization:

I acquired the ability to analyze the performance of machinery, identify inefficiencies or areas for improvement, and implement optimization strategies to enhance performance, reliability, and efficiency. This involved data gathering, analysis, and collaboration with engineering teams to implement improvements.

4. Team Collaboration:

Through collaborative projects and interactions with colleagues across departments, I learned the importance of effective teamwork and communication in achieving organizational goals. I developed the ability to work collaboratively in multidisciplinary teams, share ideas, and contribute to collective problem-solving efforts.

5. Project Management:

I gained experience in project management, including planning, scheduling, and executing projects within defined timelines and budgets. I learned how to prioritize tasks, allocate resources effectively, and adapt to changing project requirements to ensure successful project delivery.

6. Manufacturing Processes:

I gained insights into various manufacturing processes, including machining, welding, casting, and injection molding. This included understanding the principles, advantages, and limitations of each process, as well as their applications in the production of machine components and assemblies.

7. Hydraulic and Pneumatic Machinery:

I acquired knowledge of hydraulic and pneumatic systems and machinery, including their components, operating principles, and applications. This included understanding fluid power fundamentals, hydraulic and pneumatic circuit design, and troubleshooting techniques for hydraulic and pneumatic systems.

8. Organizational Operations:

I gained a deeper understanding of how an organization operates, including its structure, processes, and workflows. This included exposure to departments such as production, quality control, and supply chain management, as well as insights into the interdependencies between different functions within the organization.

9. Leadership Qualities:

Through observation and hands-on experience, I developed leadership qualities such as initiative, problem-solving, and decision-making. I learned how to take ownership of tasks, motivate team members, and effectively communicate ideas and instructions to achieve common goals.

10. Arduino and Its Application:

I acquired knowledge of Arduino microcontrollers and their applications in automation and control systems. This included programming Arduino boards, interfacing with sensors and actuators, and developing custom automation solutions using Arduino-based platforms.

TECHNOLOGY USED

Arduino



Arduino is an open-source platform used for building electronics projects. It consists of a microcontroller board, which serves as the brain of the project, and a user-friendly Integrated Development Environment (IDE) for programming it. Arduino boards are popular among hobbyists, educators, and professionals alike due to their versatility and ease of use.

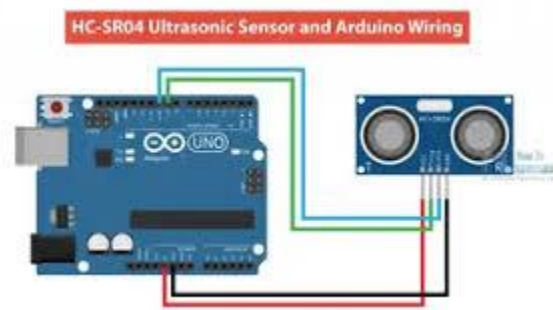
The Arduino programming language is based on Wiring, a simplified version of C/C++, and it's specifically designed for writing code for Arduino microcontroller boards. It provides a straightforward syntax and a set of functions that abstract away many of the complexities of embedded systems programming, making it accessible even to those without extensive coding experience.

Arduino IDE



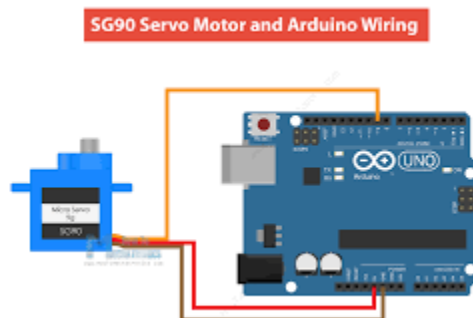
(Integrated Development Environment) is a software application used to write, compile, and upload code to Arduino boards. It provides a user-friendly interface with features such as syntax highlighting, code completion, and a serial monitor for debugging. The IDE comes with a library of pre-written code examples and a vast community of users contributing tutorials and support, making it easy for beginners to get started with Arduino programming.

Ultrasonic sensors



are devices that use sound waves to detect the distance of objects. They emit high-frequency sound pulses and then measure the time it takes for the sound waves to bounce back, allowing them to calculate distance accurately. Ultrasonic sensors are commonly used in robotics, security systems, and industrial automation.

Servo motors



are rotary actuators that allow for precise control of angular position. They are commonly used in robotics, RC vehicles, and automation applications where precise movement is required. Servo motors operate by receiving electrical signals from a controller, such as an Arduino board, which dictates the desired position and speed of the motor.

Wires



come in various types and configurations, including male-to-male, female-to-male, and female-to-female. Male-to-male wires have pins or connectors on both ends, typically used for connecting components like sensors, motors, or modules to a microcontroller or breadboard. Female-to-male wires have a female connector on one end and male pins on the other, often used for connecting sensors or modules to a microcontroller or breadboard. Female-to-female wires have female connectors on both ends and are commonly used for extending connections between components on a breadboard or connecting modules together.

A breadboard



is a prototyping tool used to build and test electronic circuits without soldering. It consists of a plastic board with a grid of holes into which electronic components can be inserted. The holes are connected internally in a specific pattern, allowing components to be easily interconnected without the need for soldering. Breadboards are commonly used by hobbyists, students, and professionals to quickly prototype and test circuit designs before creating a more permanent version on a printed circuit board (PCB).

TinkerCad



is an online platform that allows users to simulate and design electronic circuits and 3D models. It offers a user-friendly interface with drag-and-drop components, making it accessible to beginners and experts alike. Tinkercad includes a vast library of electronic components, including Arduino boards, sensors, actuators, and more, allowing users to create and test complex circuits virtually before building them in real life. Additionally, Tinkercad offers integration with Arduino, allowing users to program and simulate Arduino projects directly within the platform. This integration makes Tinkercad an excellent tool for learning electronics and programming, as well as for prototyping and testing ideas before investing in physical components.

PROJECTS

- I. One of the most significant projects I undertook during my internship at Harkaram Industries was the design and development of an innovative car with advanced safety features. The primary focus of this project was to mitigate door collision accidents, a prevalent issue in urban environments, by implementing a proactive door-closing mechanism using ultrasonic sensors.

The car design process involved a meticulous approach, from conceptualization to prototyping and testing. I worked closely with a multidisciplinary team, including engineers, designers, and safety experts, to ensure that every aspect of the car's design aligned with our safety objectives.

Key Features:

Ultrasonic Sensor Integration:

One of the standout features of the car is its integration of ultrasonic sensors strategically placed around the vehicle. These sensors continuously monitor the surrounding environment, detecting the presence of obstacles, pedestrians, or other vehicles in close proximity to the car's doors.

Proactive Door-Closing Mechanism:

Upon detecting potential collision risks, the car's intelligent system triggers a proactive door-closing mechanism. This mechanism automatically closes the doors in a smooth and timely manner, preventing accidents and ensuring the safety of occupants and pedestrians.

Smart Safety Algorithms:

The car's safety system is equipped with smart algorithms that analyze data from the ultrasonic sensors in real-time. These algorithms assess the severity of collision risks and prioritize door-closing actions accordingly, optimizing safety without compromising convenience.

User-Friendly Interface:

To enhance user experience, the car features a user-friendly interface that provides real-time feedback on the status of the safety system. Visual and auditory alerts notify occupants when the doors are closing, ensuring awareness and peace of mind.

This project has been developed due to unfortunate mishapening by opening car doors deliberately or not. Sudden collision can sometimes take lives of innocent 2 wheelers or pedestrians. Now I am going to explain each and every important point of this project and how it can be implemented in future automobile safety features technology.

- **CAUSE :**



Companies in the automotive industry often prioritize safety features and technologies aimed at mitigating car accidents involving other vehicles or pedestrians. However, there's a notable gap when it comes to addressing accidents involving still car doors and cyclists or bikers. While advancements such as automatic emergency braking, lane departure warning systems, and adaptive cruise control have become standard in many vehicles, the safety of cyclists and bikers in proximity to parked cars has received less attention.

One reason for this disparity may be the perception that accidents involving still car doors and cyclists are less frequent or less severe compared to other types of accidents. As a result, there may be less pressure on companies to innovate in this specific area. However, these accidents, often referred to as "dooring incidents," can result in serious injuries or fatalities for cyclists and bikers.

Addressing the issue of still car door accidents requires a multifaceted approach. One aspect involves educating drivers about the importance of checking for cyclists before opening car doors, as well as promoting the use of side-view mirrors to improve visibility. Additionally, implementing technologies such as sensors or warning systems that alert drivers to the presence of cyclists or bikers approaching from behind could help prevent these accidents.

Moreover, there's potential for the development of specialized safety features specifically designed to reduce the risk of still car door accidents. For example, manufacturers could explore innovative door designs that incorporate mechanisms to alert occupants if a cyclist or biker is detected near the vehicle. Furthermore, advancements in vehicle-to-vehicle communication systems could facilitate real-time warnings between nearby vehicles and cyclists, enhancing overall road safety.

Collaboration between automotive companies, cycling advocacy groups, and government agencies is crucial in addressing this issue effectively. By recognizing the importance of protecting vulnerable road users and prioritizing the development of technologies and strategies to mitigate still car door accidents, companies can contribute to creating safer road environments for everyone. Ultimately, a comprehensive approach to automotive safety should encompass not only collisions between moving vehicles but also potential hazards involving parked cars and cyclists or bikers.

STEPS TAKEN :

My innovative safety system utilizing Arduino and ultrasonic sensors to detect approaching vehicles and automatically close car doors until the vehicle passes by sounds like a promising solution to address the issue of still car door accidents. Here's a breakdown of how my system would work:

Ultrasonic Sensors:

Ultrasonic sensors are commonly used for distance measurement and can detect objects in the vicinity of the vehicle. By strategically placing these sensors along the sides of the car, you can create a detection zone to monitor approaching vehicles.

Arduino Microcontroller:

The Arduino microcontroller serves as the brain of the system, receiving input from the ultrasonic sensors and controlling the operation of the car doors based on the detected objects.

Object Detection and Analysis:

When an object, such as another vehicle or cyclist, enters the detection zone of the ultrasonic sensors, the Arduino processes the incoming data to determine the object's distance and speed.

Decision Making:

Using mathematical calculations and predefined criteria, the Arduino decides whether to activate the automatic door-closing mechanism. For example, if the detected vehicle is approaching at a speed that suggests a potential collision with an open car door, the system initiates the door-closing process.

Automatic Door Closing:

Upon determining the need for intervention, the Arduino sends signals to the door mechanism to close the car doors gradually or swiftly, depending on the urgency of the situation. This action helps prevent accidents involving still car doors and approaching vehicles or cyclists.

Safety Overrides and User Interface:

To ensure flexibility and user control, your system could incorporate safety overrides or manual operation options. Additionally, you might consider integrating a user interface, such as a display panel or smartphone app, to provide real-time feedback and configuration settings for the safety system.

Testing and Optimization:

It's essential to thoroughly test your system under various conditions to ensure its reliability and effectiveness. Fine-tuning the algorithms and parameters based on feedback and real-world testing can help optimize the system's performance.

The Breakdown Criteria:

Now there are 3 possible ways to close the door of the car when any vehicle passed by:

1. If the doors are open and there is no obstacle in between the door and car's parabola then the doors will close and locked itself automatically.
2. If the car doors are already closed then it will be locked when any passer by with cycle or bike going fast and closely with car. The locks will automatically release after they gone.
3. What if something hinders the space between car and door like we are standing or just sitting facing right outside of the car then it will blow the emergency sounds like the car horn itself or slowly trying to close the door without harming anyone, this will happen a lot before the vehicle pass by and can observe obstacle in between through laser technology. This part of the project is still in the process of R&D.

Conclusion

Integrating the proposed safety feature into the automobile industry presents a significant advancement in vehicle safety standards. By leveraging Arduino technology and ultrasonic sensors, this innovative system offers a proactive approach to mitigating still car door accidents, particularly involving cyclists and approaching vehicles. Beyond merely addressing regulatory requirements, the adoption of such a system underscores a commitment to comprehensive safety measures that prioritize not only the occupants of the vehicle but also the well-being of vulnerable road users. Moreover, this forward-thinking solution showcases the industry's capacity for innovation and adaptation to emerging safety challenges, positioning automakers as leaders in promoting safer and more inclusive road environments. Through collaboration, research, and implementation of cutting-edge technologies, the automobile industry can continue to drive progress towards a future of safer transportation for all.

II. Project: Vehicle Speed Reduction through Aerodynamic Modification

a) **Introduction:**

Speeding vehicles pose a significant risk to road safety, leading to numerous accidents and fatalities worldwide. Traditional methods of speed control have limitations, necessitating innovative solutions. This project proposes to slow down vehicle speeds by modifying their aerodynamics, thereby enhancing road safety and reducing the incidence of accidents.

b) **Objective:**

The primary objective of this project is to develop a cost-effective and practical method to reduce vehicle speeds by altering their aerodynamics.

c) **Methodology:**

(1) **Aerodynamic Modification:**

We will explore various methods to modify the aerodynamics of vehicles, such as adding spoilers, diffusers, or other aerodynamic attachments. These modifications will increase air resistance and induce drag, thereby reducing the vehicle's speed.

(2) **Simulation and Testing:**

Computational simulations will be conducted to evaluate the aerodynamic changes and their impact on vehicle speed. Subsequently, physical prototypes will be built and tested in controlled environments to validate their effectiveness.

(3) **Real-world Trials:**

Upon successful validation, real-world trials will be conducted to assess the practicality and feasibility of implementing the aerodynamic modifications on a broader scale.

(4) **Data Analysis:**

Comprehensive data on vehicle speeds, fuel efficiency, and safety metrics will be collected and analyzed to quantify the effectiveness of the aerodynamic modifications in reducing vehicle speeds and improving road safety.

d) Expected Outcomes:

- (1) Reduced Vehicle Speeds: The implementation of aerodynamic modifications is expected to result in a noticeable reduction in vehicle speeds, particularly in areas with high incidence of speeding.
- (2) Enhanced Road Safety: By slowing down vehicles, the project aims to decrease the likelihood and severity of accidents, ultimately improving road safety for all road users.
- (3) Environmental Benefits: Lower vehicle speeds can lead to reduced fuel consumption and emissions, contributing to environmental sustainability.

e) Implementation Strategy:

- (1) Collaboration: Collaboration with automotive manufacturers, transportation authorities, and regulatory bodies will be essential for the successful implementation of aerodynamic modifications.
- (2) Regulatory Support: Advocacy for supportive regulations and incentives to encourage the adoption of aerodynamic modifications by vehicle manufacturers and owners.
- (3) Public Awareness: Public education campaigns will be conducted to raise awareness about the benefits of aerodynamic modifications and promote their acceptance among drivers and communities.

f) Challenges and Mitigation:

- (1) Technical Challenges: Overcoming technical challenges related to the design, compatibility, and safety implications of aerodynamic modifications will require close collaboration with experts and stakeholders.
- (2) Market Acceptance: Convincing vehicle manufacturers and owners to adopt aerodynamic modifications may pose challenges. Demonstrating the benefits through comprehensive testing and data analysis will be crucial in overcoming resistance.

g) Conclusion:

The proposed project offers a promising approach to reducing vehicle speeds by leveraging aerodynamic principles. By modifying the aerodynamics of vehicles, we aim to contribute to the improvement of road safety and environmental sustainability. Through collaborative efforts and rigorous testing, we believe that this project has the potential to make significant strides towards creating safer and more efficient transportation systems.

CHALLENGES FACED

As a Machine Designer Intern at Harkaram Industries, I encountered several challenges that tested my adaptability, problem-solving skills, and ability to collaborate effectively with multidisciplinary teams. This brief highlights the key challenges I faced and the strategies I employed to address them during my internship period.

1. Complex Designs:

One of the primary challenges I encountered was dealing with complex design requirements for the machines being developed at Harkaram Industries. These designs often involved intricate mechanical components, advanced geometries, and specialized functionalities, which required a deep understanding of engineering principles and design methodologies.

2. Limited Access to Tools and Resources:

As a Computer Science student in the mechanical field, I faced constraints in accessing specialized tools and resources typically available to mechanical engineering interns. This limitation sometimes hindered my ability to explore alternative design solutions and conduct comprehensive simulations and analyses.

3. Basics of Physics:

Due to my background in Computer Science, I had limited exposure to the fundamentals of physics and mechanical engineering concepts, which posed a challenge when designing complex mechanical systems. Understanding principles such as mechanics, thermodynamics, and materials science required additional effort and self-directed learning.

4. Time-Consuming Projects:

Several projects assigned during my internship involved intricate designs and extensive prototyping, leading to prolonged development cycles and tight deadlines. Managing time effectively while ensuring the quality and accuracy of designs proved to be a significant challenge.

5. Communication Skills:

Effective communication with team members, supervisors, and other stakeholders was crucial for successful project execution. As a CS student in a predominantly mechanical engineering environment, I faced challenges in conveying technical ideas and design concepts clearly and succinctly.

6. Giving Priority to CS Student:

Being a CS student in a mechanical engineering internship program, I sometimes felt that they are giving more priority to me instead to my seniors which sometimes cross fire at me, my team getting a sense of non-attachment towards me. But I handle it in a good way and bring my team's spirit back. Just let you that sometimes if you get better treatment, its not always good for you.

Strategies Employed:

1. Continuous Learning and Skill Development:

To address knowledge gaps in mechanical engineering concepts and physics fundamentals, I engaged in continuous learning through online courses, textbooks, and mentorship from experienced colleagues. This proactive approach helped me enhance my understanding and proficiency in relevant areas.

2. Resourceful Problem-Solving:

Despite limited access to specialized tools and resources, I leveraged available software tools, open-source platforms, and collaborative environments to overcome design challenges creatively. This resourceful approach enabled me to explore innovative design solutions and optimize existing processes.

3. Effective Time Management:

To cope with time-consuming projects and tight deadlines, I developed a structured workflow, prioritized tasks based on project timelines and importance, and utilized project management tools to track progress. This disciplined approach helped me meet deadlines while maintaining the quality of work.

4. Communication Enhancement:

Recognizing the importance of effective communication, I actively sought feedback on my communication skills, participated in communication workshops, and practiced conveying technical concepts in a clear and concise manner. This deliberate effort helped me improve my communication skills and build rapport with colleagues.

5. Advocating for Inclusion and Recognition:

To address the challenge of prioritization as a CS student in a mechanical engineering environment, I advocated for equal opportunities and recognition based on merit and contribution rather than academic background. By actively participating in team discussions, sharing insights, and showcasing my capabilities, I earned the respect and recognition of my peers and supervisors.

ACHIEVEMENTS

During my internship at Harkaram Industries as a Machine Designer Intern, I embarked on a transformative journey marked by significant achievements and invaluable learning experiences.

Some Key Points are:

- Worked with 10+ Industry Professionals and Clients.
- Delivered 15+ projects.
- Involve in Business Meetings.
- Core Member in R&D team.
- Given briefing to clients with effective communication.
- Developed Automobile Safety Enhancement Feature.
- Bonus for Website Development.
- Researched on Hydraulic and Pneumatic Energy.
- Worked on Arduino.
- Implementing Successful Automation in 2 Factory Machines.
- Visiting 5+ other Competitive Companies like HI pvt. ltd.

One of the highlights of my tenure was the opportunity to engage in industry-level projects. Collaborating with seasoned professionals, I delved into real-world challenges, gaining practical insights and honing my problem-solving skills. This hands-on experience not only enriched my technical acumen but also provided a glimpse into the intricacies of the industrial landscape.

One project that stands out is the automobile safety enhancement initiative I spearheaded. Drawing upon my passion for innovation and mechanical expertise, I conceptualized and developed solutions aimed at augmenting vehicle safety standards. Through meticulous design iterations and rigorous testing, I contributed to the creation of innovative safety features that promise to enhance road safety and save lives.

Despite the prevalence of advanced software tools, I embraced the traditional approach to CAD software, leveraging its versatility and precision to bring my design concepts to life. This decision not only showcased my adaptability but also underscored the importance of mastering fundamental techniques in a rapidly evolving technological landscape.

A defining moment in my internship was assuming the role of project lead for Hydraulic Machinery. Tasked with overseeing the design and implementation of hydraulic systems, I embraced the challenge with enthusiasm, coordinating efforts, and ensuring seamless execution.

This leadership opportunity not only bolstered my managerial skills but also instilled a sense of responsibility and accountability.

Recognizing the importance of knowledge transfer, I took on the role of training fresh recruits in the intricacies of machine design. Guiding them through theoretical concepts and practical applications, I fostered a collaborative learning environment conducive to skill development and professional growth.

Beyond technical expertise, my internship at Harkaram Industries offered invaluable insights into the company's work culture and ethos. Immersed in a dynamic and collaborative environment, I imbibed principles of teamwork, innovation, and integrity, laying the foundation for my future endeavors in the industry.

In a testament to my multifaceted contributions, I was honored with a bonus for my exemplary management of the company's website. Leveraging my digital proficiency and creative flair, I revamped the website, enhancing its user experience and amplifying its online presence.

Overall, my internship at Harkaram Industries was a transformative journey characterized by tangible achievements, invaluable learning experiences, and personal growth. Armed with newfound skills and insights, I am poised to embark on a fulfilling career trajectory, driven by a passion for innovation and a commitment to excellence.

CONCLUSION

My internship journey at Harkaram Industries has been nothing short of transformative, leaving an indelible mark on both my personal and professional growth. Throughout this enriching experience, I have had the privilege of delving deep into the intricacies of machine design, honing my technical skills, and broadening my industry knowledge.

My Internship is still going on and will end in June, But conclusion of my internship is Understanding the Work Culture. I have gained so much experience in this 4 months of Internship. I have learnt so many things personally and professionally.

On a personal level, my time at Harkaram Industries has been a journey of self-discovery and growth. Immersed in a dynamic and collaborative work culture, I have gleaned invaluable insights into teamwork, communication, and leadership. By navigating real-world challenges and embracing new perspectives, I have emerged more resilient, adaptable, and confident in my abilities.

Professionally, my internship has served as a springboard for my career aspirations, equipping me with the requisite skills and expertise to thrive in the competitive landscape of the industry. From working on industry-level projects to assuming leadership roles and imparting knowledge to others, each experience has been instrumental in shaping my professional trajectory.

Moreover, my immersion in Harkaram Industries' work culture has provided me with a deeper understanding of the values and principles that underpin success in the industry. From fostering a culture of innovation and excellence to prioritizing integrity and collaboration, I have internalized invaluable lessons that will guide me in my future endeavors.

As I reflect on my time at Harkaram Industries, I am filled with gratitude for the mentors, colleagues, and experiences that have enriched my internship journey. Armed with newfound skills, knowledge, and a deeper understanding of the industry landscape, I am confident and excited to embark on the next chapter of my career with enthusiasm and determination.

Regards,
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