



PROPOSAL TO RAISE AWARENESS OF THE NEGATIVE BIAS IN AI CAUSED BY THE LOSS OF THE HUMAN INTELLIGENCE FACTOR

August 18, 2023

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Executive Summary

Artificial intelligence, which is the use of computers to mimic human intelligence, has begun to be heavily integrated into our daily lives. It's used in autonomous cars, our phone's virtual assistant, spam filters, job hiring, lab tests, and in agriculture to name a few examples [20]. Despite artificial intelligence's prevalence, many people in the general public are unfamiliar with how it functions or with the extent of its capabilities. They may be unaware of the risks artificial intelligence can pose to their lives and livelihood.

Our goal is to make people more aware of how artificial intelligence works and its potential risks. We propose that we create a web application that can inform the general public about the negative bias in artificial intelligence. Our hope is that by raising more awareness on this topic, we will be able to push for greater caution in the use of artificial intelligence and for more research into removing the bias in artificial intelligence.

This web application would explain how artificial intelligence (also known as AI) works, the differences between artificial intelligence and human intelligence, and how those differences can lead to a biased artificial intelligence. The web application would also discuss how those biases are harming us currently and how they may continue to harm us in the future as we further integrate AI into our society.

The application would be deployed for nearly three years with the requested funding. We would promote this web application primarily through social media and search engine optimization. This proposal will outline the necessity of the web application, its technical specifications, and a plan to promote it.

In order to fund this project, we are requesting \$10,000. \$2500 will be allocated towards hosting and deploying our proposed web application, while \$7,500 will be allocated towards paid social media advertisements on a variety of social media platforms.

Our team is qualified to successfully conduct this project. We have experience in computer science and computer engineering. Our members have experience with web development and artificial intelligence. We also have experience creating long term marketing campaigns. The combination of these skills is what we need for this project.

Abstract

Artificial intelligence, due to its differences from human intelligence, can have unintentional negative biases that people may not be aware of. This bias is due to machine learning algorithms being trained on data sets that are not representative of the populations they seek to model, policy makers not fully understanding the complex AI thought process, and a lack of transparency on behalf of AI developers. In response to the pervasive and still growing use of artificial intelligence in our society, this project aims to inform people about how artificial intelligence works, the way it differs from human intelligence, the potential bias that it can hold, and the risks those biases pose to humans. The proposal will also discuss methods for eliminating AI-induced bias in decision making. By developing and promoting an informative web application, this project seeks to push for greater awareness of bias in ai and research into how to remove or mitigate it.

Introduction

Background:

In an era marked by the rapid integration of artificial intelligence (AI) into various facets of our lives, there has emerged a critical need to address the pressing issue of negative bias embedded within AI systems. As these technologies become more ubiquitous, they wield significant influence over decision-making processes in areas ranging from finance and healthcare to criminal justice and employment. However, the increasing reliance on AI algorithms has exposed a concerning trend: the loss of the human intelligence factor, often leading to biased outcomes that disproportionately impact marginalized groups. This proposal seeks to elevate awareness of this formidable challenge, highlighting the complex interplay between AI, bias, and the diminishing role of human perspectives in the design and implementation of these systems. By shedding light on the consequences of detached AI decision-making, this initiative aims to spark a broader conversation about the critical importance of maintaining human-centric values in the development of AI solutions, ultimately striving for a more equitable and just technological landscape.

Context

As artificial intelligence (AI) continues its transformative journey across industries, there is an escalating concern regarding the insidious bias entrenched within AI systems. A significant portion of this bias can be attributed to the inherent limitation of AI models in grasping the intricacies of human intelligence—the amalgamation of emotions, cultural nuances, and ethical considerations that shape human decision-making. As these systems increasingly dictate pivotal outcomes in sectors like finance, healthcare, and criminal justice, the repercussions of their decisions become more apparent, often exacerbating existing social disparities.

The rapid ascent of AI technologies presents a paradox: while promising unparalleled efficiency and accuracy, these systems frequently exhibit alarming biases, perpetuating discrimination and unequal treatment. The root cause of this bias lies in the glaring disparity between human intelligence and AI's computational prowess. Human cognition encompasses empathy, historical context, and ethical reflection—elements often absent in AI decision-making processes. As a result, algorithms can inadvertently reinforce harmful stereotypes, neglect minority perspectives, and deepen societal divides.

This proposal seeks to illuminate the dire consequences of AI bias stemming from the absence of the human intelligence factor, underlining the pressing need for a comprehensive understanding of this issue to drive corrective action. By fostering awareness and promoting discourse, it strives to inspire collaborative efforts to recalibrate AI development, ensuring that human-centric insights remain pivotal in the creation of more equitable and unbiased technologies. Ultimately, this initiative aims to catalyze a broader conversation about the profound impact of AI bias and the imperative to safeguard the invaluable contributions of human intelligence in shaping the future of artificial intelligence.

Structure

This proposal will discuss artificial intelligence (AI) and the bias that is created due to missing the human element of thinking and feeling. Through our proposal we will first provide a basic understanding as to what AI is and how it functions. We will then discuss the differences between artificial intelligence and human intelligence. Once the audience has a basic understanding of what artificial intelligence is we will discuss how there is bias within artificial intelligence technologies using the difference between a system with bias and a system without bias. We will then discuss steps on how to bring awareness of the bias and how to solve it. Once the audience understands artificial intelligence bias and its negative effects on humanity we will then discuss how we plan to deploy this information using a website developed and designed by us. Once the audience understands how the website will be designed and developed we will explain how we plan to market the website and get the information out to people in the fastest way possible. We will utilize outside engines and sources to create advertisements for our website.

Purpose

The purpose of this proposal is to create an advertising campaign for informing the general public about how Artificial Intelligence technology works, how this technology can contribute to biased decision making, and what can be done to prevent biased decision making. This advertising campaign will include the development of a promotional website that contains all of the necessary information for the general public to understand the perils and promises of Artificial Intelligence Technology. If this proposal is accepted, then biased decision making due to artificial intelligence technology can be prevented.

Personnel and Qualifications

Fatima Rizvi, Software Developer/Marketer

Fatima Rizvi has a computer science degree backed up by three years of experience as a professional software engineer. This experience has provided her with a strong understanding of how artificial intelligence functions as well as insight into where it might be implemented in the future as technology continues to advance. She has taken two years of business classes and has had both marketing and advertising internships during which she developed multiple marketing and advertising campaigns while leading a team. Her experience in developing marketing and advertising campaigns can be applied to promoting our web application to help us spread awareness about negative bias in AI and its effects.

Jasmine Nguyen, Coder/Software Developer:

Jasmine Nguyen holds a degree in computer science, which has equipped her with a solid foundation in programming, algorithms, and software development methodologies. Throughout her academic journey, she gained a deep understanding of various programming languages, data structures, and database management. She has successfully applied this knowledge in various projects, both independently and collaboratively. Her experience includes developing web applications, where I've utilized front-end technologies like CSS and JavaScript, combined with back-end languages such as Python and Java. She has also tackled challenges in algorithm design and analysis, showcasing her problem-solving abilities. Her academic journey has instilled in her a strong commitment to continuous learning, adaptability, and a passion for innovation in the field of computer science.

Noah Bean, Artificial Intelligence Policy Expert:

Noah Bean earned his undergraduate degree at Oregon State University where he studied Electrical and Computer Engineering. During his time in school, he developed a capacity to solve complex problems and was able to demonstrate this skill during his MECOP internships. As a member of the Robotics Club, he gained experience designing and testing automated systems. He has worked on multiple side projects that combined the topics of Artificial Intelligence with Finance to predict stock market prices. He also has experience working as a Learning Assistant at Oregon State University, where he was trained on Diversity, Equity, and Inclusion in education.

Cody Renfro, Web Designer/Developer:

Cody has a computer science degree with two years of web development experience, four years of python coding language experience, and four years of HTML design coding experience. This experience has provided him with an intermediate understanding of web development and how to develop web applications using the python coding language. He has successfully created two functioning web applications using python, flask, HTML, and MySQL. His ability to create a simplistic web application using his experience with HTML styling will easily allow users to read and digest all the information about artificial intelligence provided by the group.

Body Sections

What is AI?:

Artificial Intelligence (AI) encompasses the replication of human intelligence processes within machines, particularly computer systems. These processes involve learning, reasoning, and self-correction, all aimed at enabling machines to perform tasks that typically require human intelligence[15]. The significance of AI stems from its capacity to bring about transformative changes across numerous domains.

One of the primary reasons AI holds immense importance is its role in automation and efficiency enhancement. By handling repetitive and mundane tasks, AI contributes to heightened productivity and cost reduction, while also allowing human workers to concentrate on more strategic and creative endeavors [14]. Furthermore, AI's effectiveness in data analysis enables the rapid and precise examination of vast datasets, uncovering intricate patterns and trends that might elude human perception. This capability empowers organizations to make well-informed decisions based on comprehensive insights.

AI's impact extends to personalized experiences, as its ability to analyze user preferences and behaviors facilitates tailored recommendations in sectors such as entertainment, e-commerce, and marketing. Equally significant is AI's problem-solving aptitude, which tackles intricate challenges that might surpass human capacities. For instance, AI is utilized to optimize complex supply chain logistics and expedite drug discovery processes. Additionally, AI contributes to safety and security efforts by identifying security breaches, fraudulent activities, and anomalies through data analysis [15].

The emergence of autonomous systems powered by AI, such as self-driving vehicles and robotic applications, transforms industries such as transportation, agriculture, and manufacturing. Meanwhile, AI's natural language processing capabilities enable effective human-machine communication, enhancing applications like virtual assistants, language translation, and sentiment analysis.

AI's contributions to scientific research cannot be understated, as it expedites data analysis, system simulations, and outcome predictions in fields such as astronomy, climate science, and particle physics. This acceleration of research advances human understanding and technological capabilities. Moreover, AI fosters innovation by expanding the realm of possible solutions and technologies [13]. As AI evolves, it promises novel methods of addressing complex challenges and sparking creativity across various sectors. Lastly, AI promotes accessibility by providing tools that cater to individuals with disabilities, thereby fostering inclusivity and improving their quality of life. The significance of AI resides in its potential to reshape diverse facets of society, amplifying efficiency, decision-making, and creative problem-solving. It is a tool that, when employed ethically and responsibly, has the capacity to bring about profound positive transformations in our daily lives and work endeavors.

The Difference between AI and Human Intelligence:

Artificial Intelligence (AI) and human intelligence exhibit distinct characteristics across various dimensions. AI is the result of human programming, relying on algorithms and data analysis to operate within predetermined parameters. It learns from data patterns through machine learning techniques, although its adaptation is limited by constant training and updates.[15] In contrast, human intelligence has evolved over millions of years through biological processes, encompassing cognitive abilities like creativity, reasoning, and emotion. It is shaped by experiences, interactions, and a capacity to learn from diverse contexts.

AI's understanding is context-bound, interpreting information within its programmed boundaries and relying on pattern recognition rather than genuine comprehension. Human intelligence, on the other hand, possesses the ability to grasp intricate contexts, drawing on a wide array of experiences, emotions, and cultural insights.[14] While AI can simulate emotional responses, it lacks authentic emotions and empathy, which are inherent to human experiences and essential for connecting with others on a deep emotional level.

Creativity and originality are areas of distinction. AI generates creative outputs based on learned patterns, yet its conceptual creativity and intuition fall short of human levels. Human intelligence is known for its unparalleled creativity, generating novel ideas, art, music, and solutions that often transcend established patterns.[13] Furthermore, common sense and intuitive understanding of the world are inherent to human intelligence, providing a basis for anticipating outcomes and navigating daily life effectively. AI, however, lacks inherent common sense and relies on explicit data and rules provided by programmers.

In terms of physical capabilities, AI exists as software or within machines, lacking the physical presence and abilities of humans who integrate their intelligence with their bodies. Moreover, while AI can unintentionally amplify biases present in its training data, it lacks the human understanding of bias, its implications, and the importance of mitigating its influence.[13] Human intelligence encompasses the ability to perceive and understand bias, integrating subjective perspectives, moral reasoning, and ethical decision-making that reflects cultural, social, and personal beliefs.

AI and human intelligence differ significantly in their origins, learning mechanisms, emotional capabilities, creativity, understanding of context, physical embodiment, and moral reasoning. While AI has made remarkable advancements, the intricate complexities, adaptability, and holistic understanding demonstrated by human intelligence continue to set the two apart.

Bias in Artificial Intelligence Applications

While artificial intelligence technology holds the promise of making faster and more accurate decisions than humans can make, these algorithms can only be as accurate as the data sets they are trained on. Because AI decision making processes are complex, based on large data sets, and hidden behind advanced mathematics, most people are unable to comprehend this thought

process and blindly trust that the algorithms are correct. Consequently, the subject of bias in artificial intelligence has become a large concern for AI experts and industry leaders. Bias can be defined from a statistics framework as any deviation from the expected mean that cannot be explained by other factors [21]. In mathematical notation, the bias of an estimator (a statistical model for how two or more variables are related) can be defined as:

$$\text{bias}(U) = E(U - \Theta)$$

Where U is an estimator, $E(x)$ is the expected value of x , and Θ is the real value of a parameter being estimated [27]. Thus, an estimator is unbiased if:

$$E(U) - \Theta = 0$$

Which implies that there is no difference between the estimator model and the parameter being estimated, so that the estimator accurately predicts outcomes [27]. With respect to machine learning algorithms, which are essentially just complex statistical models, bias occurs when the model prediction and the observed data are different [27]. Consequently, bias appears when there is error during the data collection process, when the data itself is intentionally or accidentally falsified, or when the sampling of data is non-representative of the population being described [21]. This third factor is generally what leads to concern among experts. Three prominent industries where bias occurs when using artificial intelligence technology include in the medical field with medical imaging, in the employee hiring process with resume filtering, and in the justice system with criminal sentencing [22], [23], [25].

In the medical field, advancements in image processing AI have led to algorithms that can detect skin cancer by only examining a picture of a person's skin in order to find patterns common to skin cancer diagnosis [23]. However, cancer diagnosis accuracy appears to be different for underrepresented races [23]. Artificial intelligence can also be used to examine chest x-ray images, but this has led to differences in accuracy for underrepresented biological sex groups [23]. It has also been found that most datasets that are being used to train medical diagnostic AI only come from the three US states of California, Massachusetts, and New York [23]. Consequently, AI tends to discriminate on at least the basis of race, sex, and geography. Furthermore, because of the HIPAA (Health Insurance Portability and Accountability Act of 1996) rules, obtaining sufficient datasets is nearly impossible, since hospitals that do share private records will lose customers [23]. The public does have a right to be concerned about data privacy since this information could be used maliciously, but the consequences for not sharing health data are also apparent in unequal outcomes for different patient groups [23].

Another example of artificial intelligence bias appears in the hiring process [22]. When a company is hiring for a job position, they can use the currently available artificial intelligence algorithms to analyze resumes that have been hired in the past to predict what qualifications they should be looking for in a job candidate [22]. This usage of AI has the potential to save companies lots of time and money while looking for a candidate by predicting skill and culture fit, but the quality of the candidate might also be called into question [22]. During the hiring process, there are at least four stages [22]. These stages include sourcing, screening, interviewing, and selection [22]. Artificial intelligence is currently being used in the screening phase to remove resumes that do not seem to fit the company's needs by checking for keywords

that match desired skills and qualifications [22]. However, sometimes these algorithms pick up on unintended variables such as surnames and college names that might disqualify historically underrepresented groups of people [22]. Furthermore, the actual screening algorithms are well hidden from the public since they are proprietary [22]. This technology use might be a lawsuit waiting to happen since Title VII of the Civil Rights Act of 1964 prohibits discriminatory behavior based on “race, color, religion, sex, or national origin” [22]. Because of this ruling, companies that sell resume screening algorithms are strongly incentivized to check their product for “disparate treatment” where explicitly discriminatory variables are used [22]. However, this ruling also claims that companies are liable for “Disparate impact” if the measured outcome is significantly lower for two separate categories of people and the company cannot explain why this outcome is necessary for business [22]. Consequently, companies that sell proprietary resume filtering algorithms are incentivized to remove obvious bias in their product while the possibility of legal action exists, but unintentional bias is difficult to prosecute and correct [22].

Finally, artificial intelligence bias can appear in the justice system [25]. When a judge is deciding if a defendant should receive bail, or how a convicted criminal should be sentenced, an AI algorithm is frequently used to justify the decision [25]. These sentencing algorithms work by using historical data sets that may be tainted with historical bias towards certain racial groups [25]. Another application of AI in the justice system is the usage of facial recognition software as evidence in a criminal case [25]. However, facial recognition technology has been shown to be less accurate when analyzing the faces of people with certain skin colors and this may lead to bias [25].

Solutions to the Problem of Artificial Intelligence Bias

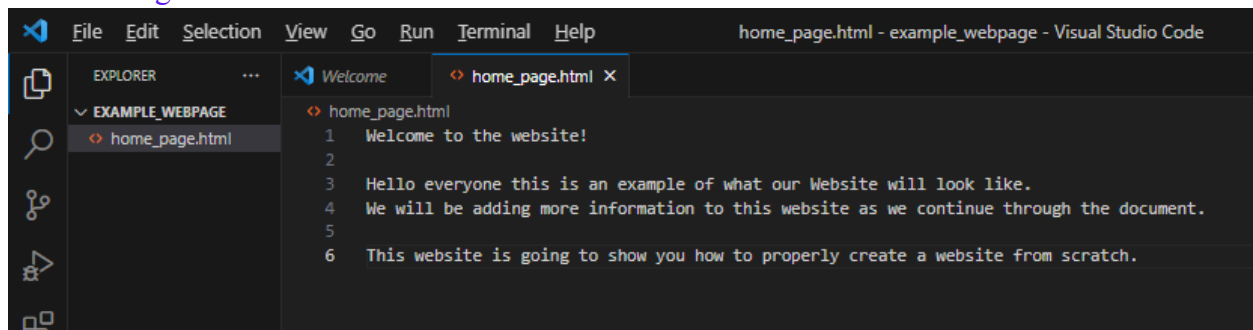
In order to correct bias in artificial intelligence technology, concrete steps can be made by business leaders and AI implementation professions. One such step is to encourage business leaders to hold current information on AI technology and its applications [24]. Business leaders should read about how this technology works from trusted research institutions and experts in order to understand the AI thought process as much as possible [24]. Another step is for companies to have responsible and ethical processes for mitigating bias when using artificial intelligence [24]. Some responsible practices include “red teaming” the algorithms and data sets by utilizing special task forces of people who were not involved in developing the original datasets to monitor the algorithms for bias, as well as increasing transparency in a given AI algorithm’s decision making, and making data sets less reliant on historical data sets [24]. This step is especially important since intentional and obvious bias can cause a company to become ensnared in lawsuits from civil rights groups [24]. The next step is to have companies engage in fact-based, open discourse about bias in AI with customers and employees [24]. The goal of these conversations should be to develop standards about removing bias and not placing blame [24]. Next, humans and machines must work together in order to check for bias [24]. Humans can check the work of machines, while machines can check the work of humans in order to provide accountability [24]. Implementers and human decision makers should never blindly trust algorithm decisions since machines are incapable of sufficient context to solve all problems accurately [24]. Finally, companies must invest more in collecting high quality, representative

datasets for use with AI technology [24]. This can be done by consulting statistical experts to check for sampling bias and also brainstorming potential sources of bias in the data [24]. Essentially, artificial Intelligence technology is only as accurate as the data it is trained on, and these data sets are only as accurate as the processes that develop them [24]. AI has the potential to make fair and accurate decisions, but the results will only be as fair and accurate as humans allow them to be [24]. It is up to the stakeholders of AI technology to collaborate with researchers, civil rights groups, business leaders, policy makers, and AI developers to ensure that the ideal Western values of employment meritocracy, evidence-based common law, and Hippocratic medical practices continue to occur [25].

Web Format and Design

One of the most important decisions when it comes to building a website is how you decide to format it. We want to format the website in a way that is easy to understand and draws the viewer's attention. In order for us to write a simplistic website we must use css files and html files in tandem. There are 5 steps when it comes to completing a formatted website. Step 1 is to create the raw content that will be displayed on the website. Step 2 is use different tags to create a structure for the website. Step 3 is to describe the raw content using text elements. Step 4 is to add an image that gives visual information as well as written information. Step 5 is using css stylizing to make the content on the website look appealing.[19]

Step 1 for building and formatting a usable website includes understanding naming conventions, writing and saving content to an index.html file, and understanding multiple white spaces gets ignored from written content. For file naming conventions it is best practice to avoid using special characters such as \$, #, %, etc.[19] It is also important to not use the space character when naming a file. For our website we will keep our file names in lowercase with an underscore separating different words. An example file name would be home_page.html. To save information to our new html file we will use a text editor to edit the information inside of the html file. When we write our content to the html file since white space over two spaces gets ignored, we will write in sentences and then break up the paragraphs using line breaks. An example output of our html file is shown in Figure 1. The website created from this html file is shown in Figure 2.

A screenshot of the Visual Studio Code editor interface. The title bar at the top reads "home_page.html - example_webpage - Visual Studio Code". The interface includes a menu bar (File, Edit, Selection, View, Go, Run, Terminal, Help) and a sidebar on the left with icons for Explorer, Search, Source Control, and Run and Debug. The Explorer sidebar shows a folder named "EXAMPLE_WEBPAGE" containing a file named "home_page.html". The main editor area displays the content of "home_page.html" with line numbers 1 through 6. The code is as follows:

```
1 Welcome to the website!  
2  
3 Hello everyone this is an example of what our Website will look like.  
4 We will be adding more information to this website as we continue through the document.  
5  
6 This website is going to show you how to properly create a website from scratch.
```

Figure 1 - Step 1 HTML code

Alt Text: A snippet of basic HTML code for adding sentences.

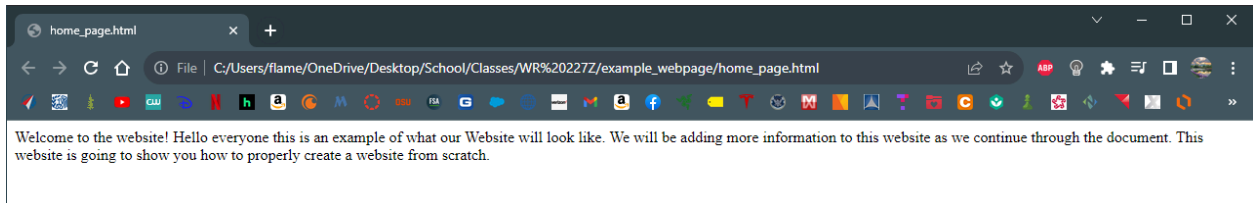


Figure 2 - Step 1 website
Alt Text: How the website looks using the code from Figure 1.

Step 2 and Step 3 for building and formatting a usable website includes using html tags such as `<html>`, `<head>`, `<body>`, and `<p>` to make the information look readable. For proper functionality all of the website content must be within an `<html>` tag.[19] You can use the `<head>` tag to rename the website on the tab as well as add a favicon. A favicon is the small logo on the tab of each website. For our website we will keep it simple. We will use the `<html>` tag to encompass the entire html file. Then we will use the `<title>` tag inside of the `<head>` tag to name the website. After the name for the website has been created we will use the `<h2>` tag to create a title for our website explaining what topic we will be discussing throughout the website. We will then use the `<p>` tag to add information underneath the title. An example of how this will look in the html file is shown in Figure 3. An example of how the website looks with the tags is shown in Figure 4.

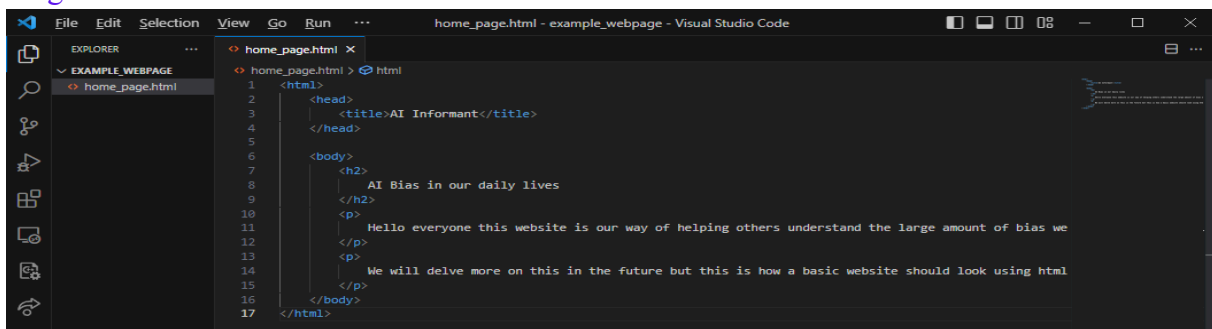


Figure 3 - Step 2 and 3 HTML code
Alt Text: A snippet of basic HTML code using tags to create a title and paragraphs.

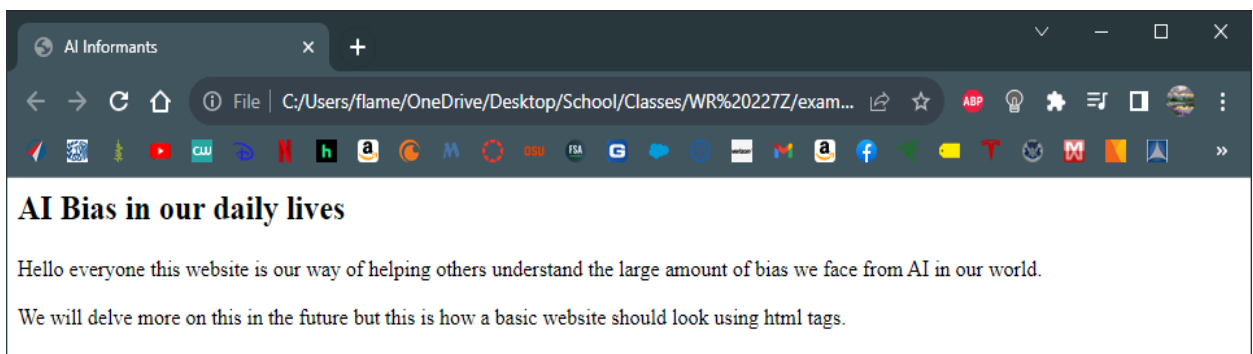
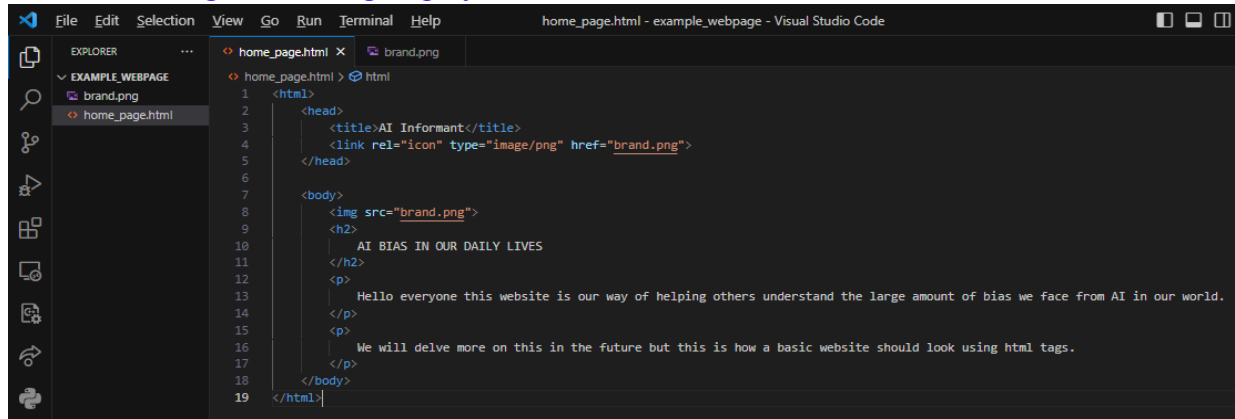


Figure 4 - Step 2 and 3 website
Alt Text: How the website looks using the code from Figure 3.

Step 4 is where we choose which images to add to the website. For us I will use the logo for our brand that Fatima has created for our favicon and our website image. In order to add an image as a favicon you must use the `<link>` tag inside of the `<head>` tag and reference the image inside of the same folder as the html file. In order to add an image to a website you must use the `` tag inside of the `<body>` and reference it the same way.[19] Figure 5 shows the html file referencing the logo image as a favicon and as an image for the website. Figure 6 shows the favicon and image both being displayed.



```
1 <html>
2   <head>
3     <title>AI Informant</title>
4     <link rel="icon" type="image/png" href="brand.png">
5   </head>
6
7   <body>
8     
9     <h2>
10      AI BIAS IN OUR DAILY LIVES
11    </h2>
12    <p>
13      Hello everyone this website is our way of helping others understand the large amount of bias we face from AI in our world.
14    </p>
15    <p>
16      We will delve more on this in the future but this is how a basic website should look using html tags.
17    </p>
18  </body>
19 </html>
```

Figure 5 - Step 4 HTML code

Alt Text: A snippet of HTML code adding the images to the website.

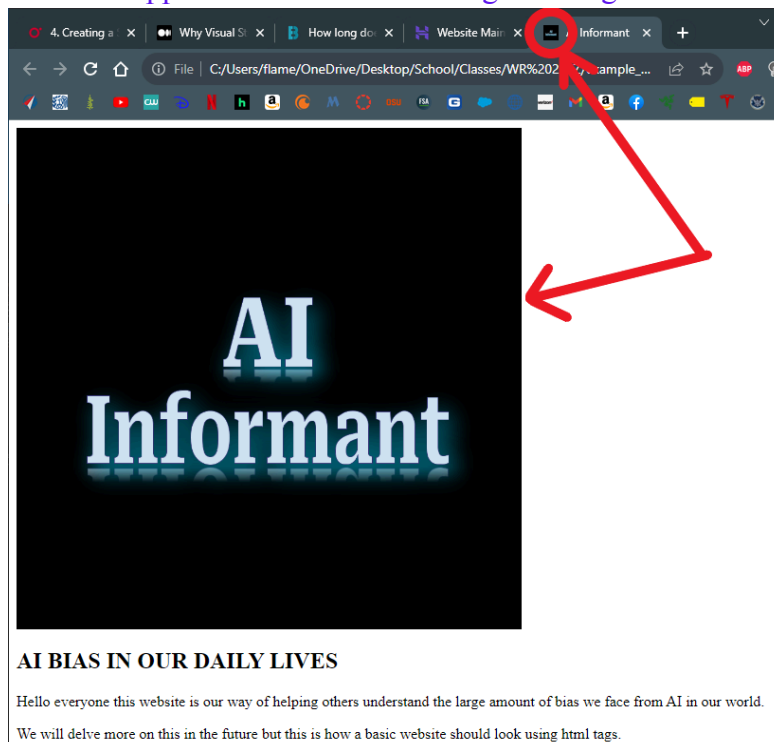
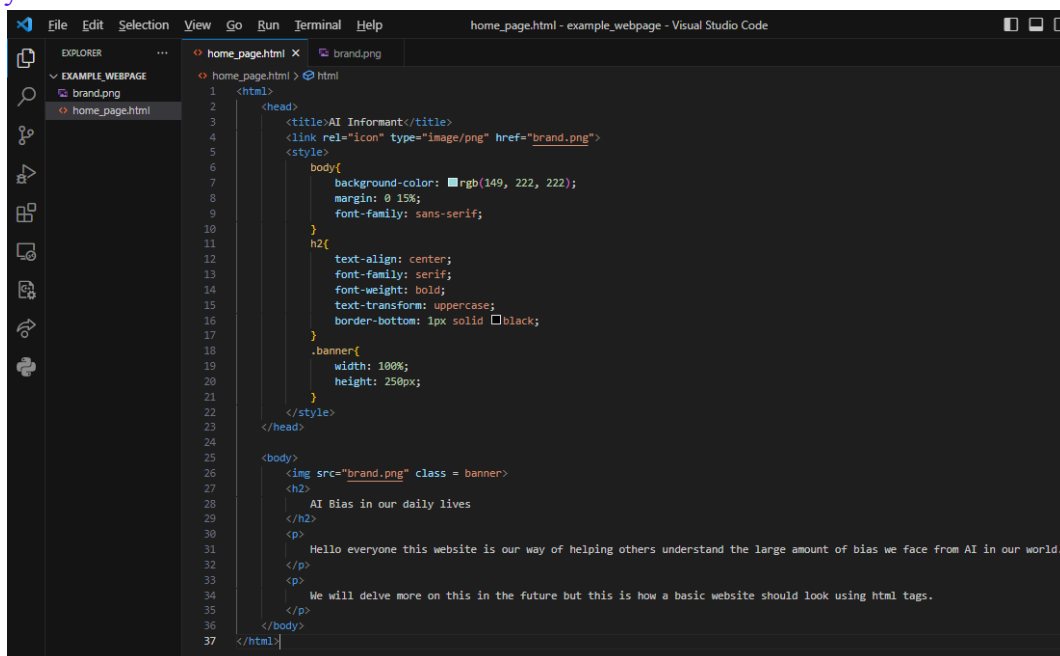


Figure 6 - Step 4 website

Alt Text: How the website looks using the code from Figure 5.

Step 5 of formatting the website is the most important step as it allows you style your website to the way you want it to. In order for us to style our website we need to add a <style> tag inside of the <head> tag of the html file. Inside of this <style> tag there are multiple settings you can apply to the text and images inside your website.[19] For our web site I will style the brand logo as a cover photo that is at the top of the website and spans across the entire width. I will also be adding color to the back of the website so it is not a dull white color. I will also be separating the title of the website with a <hr> tag. This will create a line break. I will also be centering the title and changing the color of title to a lighter color than just black. Figure 7 will show the updated html file showing all of the style changes. Figure 8 will show the updated website after it has been styled.

A screenshot of the Visual Studio Code editor interface. The Explorer sidebar on the left shows a project named 'EXAMPLE_WEBPAGE' containing 'brand.png' and 'home_page.html'. The main editor window displays the 'home_page.html' file. The code is as follows:

```
1 <html>
2 <head>
3   <title>AI Informant</title>
4   <link rel="icon" type="image/png" href="brand.png">
5   <style>
6     body{
7       background-color: rgb(149, 222, 222);
8       margin: 0 15%;
9       font-family: sans-serif;
10    }
11    h2{
12      text-align: center;
13      font-family: serif;
14      font-weight: bold;
15      text-transform: uppercase;
16      border-bottom: 1px solid black;
17    }
18    .banner{
19      width: 100%;
20      height: 250px;
21    }
22  </style>
23 </head>
24
25 <body>
26   
27   <h2>
28     AI Bias in our daily lives
29   </h2>
30   <p>
31     Hello everyone this website is our way of helping others understand the large amount of bias we face from AI in our world.
32   </p>
33   <p>
34     We will delve more on this in the future but this is how a basic website should look using html tags.
35   </p>
36 </body>
37 </html>
```

Figure 7 - Step 5 HTML code

Alt Text: A snippet of HTML code showing how to add stylization to the webpage.

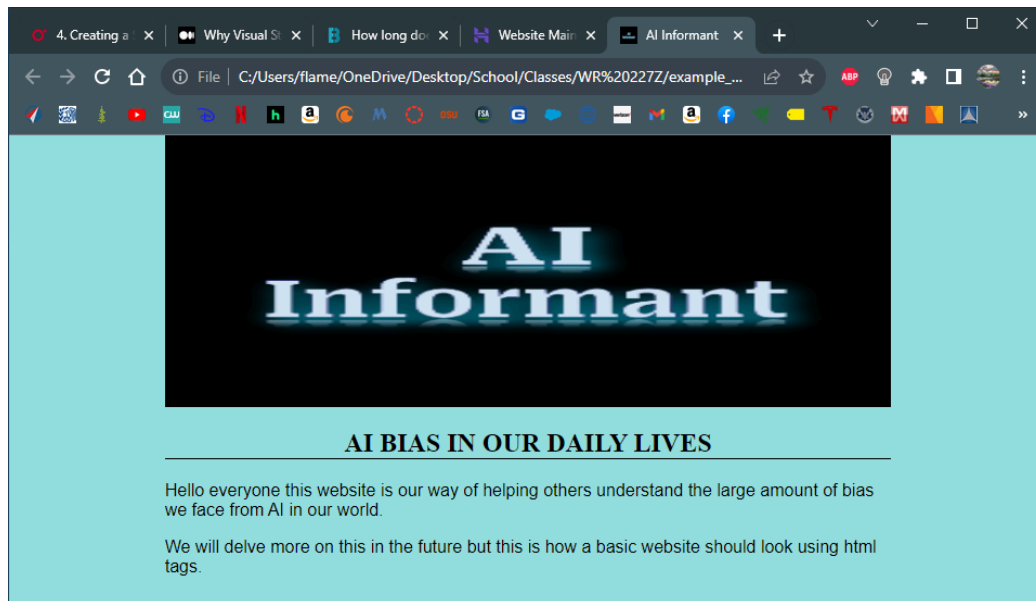


Figure 8 - Step 5 website
Alt Text: How the website looks using the code from Figure 7.

Software Used for Development

The software that we will be using as a text editor and code writing tool will be Visual Studio Code (VS Code). I chose this software based on my personal experience using it in the past on my own websites. The functionality of VS Code allows the web developer to use any coding language they are comfortable with to create a creative and informative website that helps provide users with the information they are looking for. Mr. Al-Raheem, a front-end tech lead with a master's degree in software engineering agrees that his go to code editor is VS Code.[16] On his blog post on Medium.com he explains some key reasons why he believes VS Code is the best code editor for web development.

The first reason is the refactoring power that VS Code offers compared to other code editors. VS Code allows you to augment variable names all at once instead of one at a time with the F2 key and allows the user to create global functions using the built in extract method.[16] The second reason is the built-in integration VS Code has with Git. It allows the web developer to directly work with Git repositories straight from the VS Code terminal using commands that are easily accessible from the search function when typing in Git.[16] The third advantage VS Code has is the plethora of extensions you can add to your software. There are many extensions that have been developed for almost any scenario and they are easily downloadable through the extension tab and easy to read and operate.[16] The fourth reason is how customizable the window layout is. You can have multiple files open side by side for editing just by dragging and dropping the file to the left, right, top, or bottom of the display. It also allows you to have multiple terminals open at once.[16] The final advantage is the Intellisense engine VS Code uses as it instantly lets you know when there is an error in the code as well as gives you definitions about why the error might be occurring.[16]

Development Time and Costs

Creating a website can take many weeks and cost thousands of dollars depending on the scale of the website and how many hours you want to put into the development process. For all websites there are steps in the process when creating a fully functional website. First is deciding on whether to hire a web developer to design the website or in our case I would be working with my team to create the website since I already have web development experience.[17] Second would be the time it takes the web developer to design and create the website. The website creation phase can be broken down into five steps: discovery, design, development, modification, and launch.[17] The discovery step for our website includes what content will be inside of the website, how the content is structured, and different features available to the users. This step will take at least 3 weeks to complete.[17] The design step for our website will include how we intend to style the website, and create mock images of how the website will look. This step will take 6 weeks for us to complete.[17] The development step for our website will include all of us building the website based on the designs and functionality from the previous steps. This step will take 3 weeks to complete.[17] The modification step for our website will include fixing any issues with the website after the initial development step. This step will take at least 2 weeks but can take more depending on how many modifications need to be made.[17] Overall the minimum amount of time it will take to fully create the website is 14 weeks. This must be accounted for in our planning for when we want the website to be available for user consumption.

The price of maintaining a website mostly depends on the type of website you are trying to develop. The price for a personal website to be maintained each month is as low as \$5 and the price for an eCommerce website to be maintained each month is as high as \$5000.[18] The type of website that fits our needs is a professional blog which can cost as little as \$25 a month and as high as \$75 a month.[18] Since we are developing the website ourselves we do not need to pay someone to do it for us. Since we are allocating \$2500 to web development, at \$75 a month we can run the website for 33 months before we start to run out of funds. In order to help fix this issue we can create a function on the website that allows for users to donate funds to help keep the website functional.

Promotion Plan

In order to promote this web app, we plan to utilize a variety of methods. We need to raise awareness about the website's existence, persuade people to navigate to the website, and make the website easy to access in order to generate increased traffic on the website. We can do this through social media and search engine optimization [5]. \$7,500 of our budget will go towards social media promotion.

Before we can campaign, we need to create a brand for our organization. A distinct brand will allow for us to stand out and become recognizable, and having an identity will help people remember us and boost our other promotional efforts [4]. This brand needs to emphasize our focus on tech and AI. Our brand name will be "AI Informant". The name is straightforward and

to the point, clearly stating what our purpose is. We need a logo to use on our social media accounts and any future content. Figure 9 depicts a sample logo that is simple and can be used across all social media platforms.



Figure 9: AI Informant Logo
Alt Text: The organization's logo, which is the words "AI Informant" in glowing blue letters on a black background

In our social media campaign we will focus on promoting through Facebook, Instagram, and LinkedIn. These platforms are highly popular and can reach a larger audience [1][2]. Our general plan, before adjusting it for each individual platform, is to use a mix of regular posts and paid promotional posts. Paid social media ads will allow us to get our brand and website in front of more eyes and allow us to target our campaign at specific groups of people [5]. These ads will link to our web application so that viewers can go straight to it. We will be able to track the number of views and clicks that the ads get, which will help us determine which ads were the most effective and allow us to adjust our strategy accordingly. Our content will consist of individual facts from our website and an invite to learn more by exploring our website. We will also tag our non-paid posts with the following hashtags to help increase their reach [6]:

- #ArtificialIntelligence
- #AI
- #MachineLearning
- #DeepLearning
- #DataBias
- #BiasInAI
- #ArtificialIntelligenceEthics

- #AIResearch
- #AIInformant
- #Programming
- #DataScience
- #Technology

Facebook has an active daily user count that is roughly equivalent to 20% of the population, making it a popular choice for social media marketing [3]. In order to establish our organization on Facebook, we need to create a Facebook Page instead of a personal profile, as Pages are intended for business or communities and will allow for a more professional presence on the site [3]. Our Page will be named “AI Informant” (to stay aligned with our brand), use our logo as a profile picture, and include a descriptive “About” section describing our purpose. We will also link our website. Facebook groups are a great way to engage with people with an interest in AI, and we can request to join the “Artificial Intelligence & Deep Learning” (a highly popular AI Facebook group) and post our content there in addition to our paid posts [7]. Facebook advertisements cost about \$0.97 per click, so we will allocate about \$1500 towards promoting our Facebook posts, allowing us to reach a max of about 1613 clicks on our ads [9].

Instagram is the second most popular social media after Facebook, making it a necessity to promote there as well [8]. We will create a business profile using our logo, name, and website in a similar way as we did for Facebook. First we need to create and post 5-10 posts using the hashtags listed above. After that we will begin trying to increase our followers by following other popular content creators who post about artificial intelligence and interacting with their content and followers to help increase our presence [8]. The cost to advertise on Instagram is higher at about \$3.56 per click, so we will allocate \$2950 towards promoting on Instagram, which will allow us to max out at about 829 clicks on our ads [9].

The last social media platform we will promote our website on is LinkedIn. We can use this platform to reach the audience of professionals in tech and business who would be interested to see the impact AI will have on their industries. We will need to create a business page on LinkedIn and set up the profile picture, name, and about section in a similar way as we did on Facebook. LinkedIn also has the ability to create and claim our custom url, which will help improve our profile in the search results [10]. We can target our advertisements toward people with job titles in Data Science and Machine Learning. While our posts on other social media platforms will be more brief, on LinkedIn we can create longer posts containing relevant content from our website [10]. Similar to Facebook, we will join related LinkedIn groups, such as ones about Artificial Intelligence, and post there. We can also interact with and reblog similar content to ours to increase our presence on the platform. The cost to advertise on LinkedIn is about \$5.26 per click, so we will allocate about \$2050 towards promoting on LinkedIn, which will give us a max of about 390 clicks [9].

We will be able to use the engagement tracking software built into the aforementioned social media platforms to track how many interactions we get and where all of the interactions are

coming from. This will help us figure out which posts and which platform is the most successful, allowing us to adjust our strategy accordingly. These statistics will also inform us about the overall success of our campaign.

The other strategy we want to use to increase traffic to our website is search engine optimization, also known as SEO, which is the process of adjusting a website to increase its chances of ranking high in the search results when people search relevant keywords [5]. We can optimize our website by making the site's title and subsequent page titles related to artificial intelligence, machine learning, data science, and negative bias. This is because the titles are critical for users when deciding which results to select [5]. Titles should be unique, short, and consistently cased as well [5].

We can also include meta descriptions (short and enticing summaries) on the website's pages to help engage users [5]. The meta description typically is displayed in search results and helps to pitch the specific page to the user. These descriptions should include keywords (such as artificial intelligence and bias), summarize the page's content, have a max length of 145 characters, and be unique [5].

Another key to search engine optimization is using long-tail keywords as well. Long tail keywords are longer, more specific phrases that users are more likely to use when searching for something specific [11]. These tend to be looked up less frequently than short keywords but they can be extremely useful to attract people who are looking for exactly what our webpage has to offer; about 70% of page views come directly from long-tail keywords [11]. We could use the following long-tail keywords in our website:

- Bias in AI
- Artificial intelligence bias
- Artificial intelligence ethics
- Bias in AI examples
- Examples of bias in AI
- AI discrimination examples

Social media campaigns and search engine optimization have the ability to be relatively low cost. Additionally, by utilizing the same content among our various platforms we can make our platforms relatively simple to manage. Social media has proven to be a powerful promotional tool in the past when utilized correctly, and our budget for paid promotion will help to boost that ability [12]. This accessibility makes this campaign a feasible option to promote our web application.

Conclusion

Artificial intelligence will be a great asset to humanity if it is used responsibly and with the appropriate level of caution. This technology can consume vast amounts of data in order to reason and gain insights that humans simply cannot. However, because Artificial Intelligence is

far different from human intelligence, many misconceptions exist in the public. Some of these misconceptions include how AI algorithms actually work, as well as how AI should be used. If these misconceptions are not addressed, then Artificial Intelligence can generate biased results that humans do not catch in time, thus creating great harm. In order to solve this problem, the group proposes to develop a website that contains information about Artificial Intelligence. This information will include how AI differs from human intelligence, how AI has caused biased decision making in multiple different industries, and what business leaders can do to reduce the unintended effects of AI. This information will be advertised to the public through Search Engine Optimization and social media campaigns in order to attract business leaders and AI implementation experts. If people become more aware of the perils and prospects of artificial intelligence usage in a variety of industries, then action can be taken to ensure that this technology is used to benefit humanity. One of the ways this could influence our society's views towards AI is to allow them to see a broader picture than just the fancy technology that they don't really understand. As our website grows in popularity and we start to gain more money from donations to keep the website up and running we could start using excess money from those donations to fund research on how to create a more humanized unbiased AI that can start to be introduced into the world. This can then hopefully replace all AI technology used currently that is biased. This would eliminate this unneeded social diversity due to our world's current need to automate and speed up our processes. With how fast technology is currently growing it's hard for people to understand that speed is not the only thing that matters. The one thing that matters above all else are us, people. Securing the rights for one race of people to be given more opportunity above others is inhuman. We are stronger together and we will prosper and grow to greater heights together. Let us educate not only you but everyone around the world so that this error in human history may be corrected. Because if not, then we are only making our lives harder and striving for mutual destruction.

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Appendix

Linear Regression:

The most fundamental machine learning algorithm is the statistical method of Linear Regression. This technique is used to predict the relationship between two or more variables by mathematically processing a data set and generating a line of best fit. In the case of predicting how a single independent variable (x) affects a single dependent variable (y), a line can be drawn in the cartesian coordinate system such that the difference between each data point and the line is minimized [26]. This line would have the mathematical relationship:

$$y = mx + b$$

Where y is the dependent variable, m is the correlation coefficient (a real number between -1 and 1 and indicates how related two variables are, with 0 representing no relationship at all, -1 representing an inverse relation, and 1 representing a direct relationship), x is the independent variable, and b is the y-intercept or measure of what the dependent variable would be if no independent variable was present [26]. In order to draw this line of best fit, an algorithm can be used to measure the distance between each data point and the line and adjust both the variables m and b accordingly [26]. This mathematical algorithm can be given by:

$$m = \frac{\Sigma y \Sigma x^2 - \Sigma x \Sigma xy}{n \Sigma x^2 - (\Sigma x)^2}$$
$$b = \frac{n \Sigma xy - \Sigma x \Sigma y}{n \Sigma x^2 - \Sigma x}$$

Where Σ representing the sum function, x is the independent variable, y is the dependent variable, m is the correlation coefficient, and b is the y-intercept [26]. By performing this linear regression algorithm, a mathematical relationship between two variables has been defined, and essentially all machine learning technology relies on this thought process of optimization in order to make predictions [26].

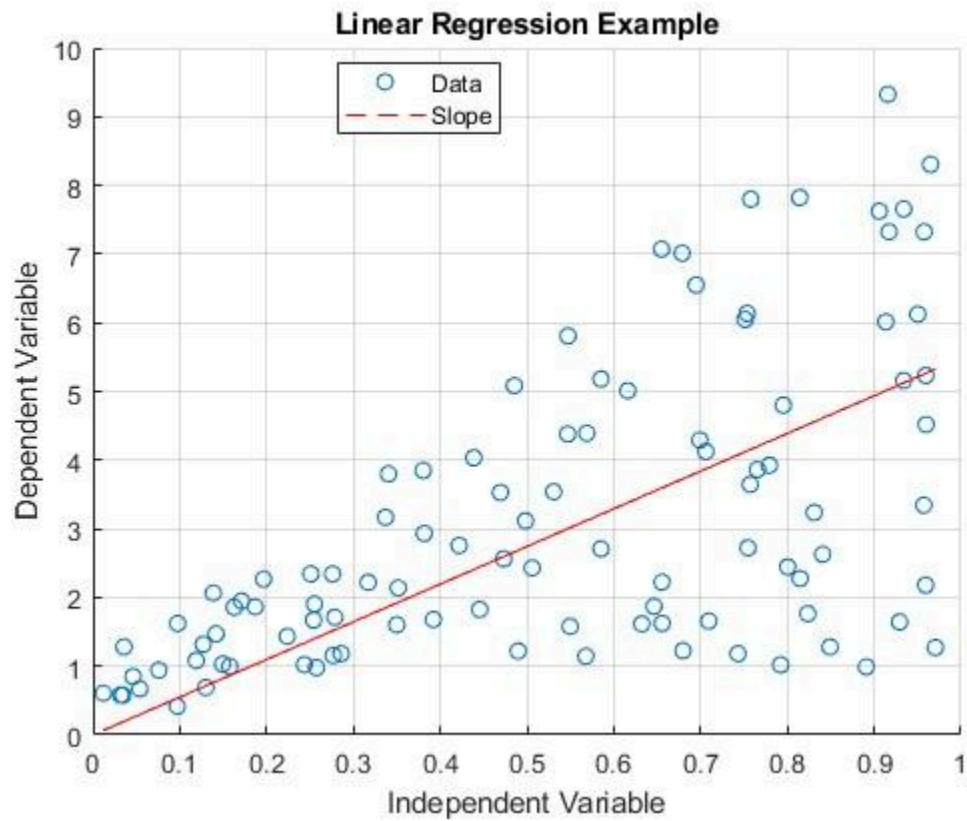


Figure 10: A linear regression model that predicts the correlation between a dependent variable and an independent variable.

Alt Text: An image of a linear regression model created in Matlab by using semi-random data, where a line of best fit has been drawn on a graph to represent the mathematical relationship between an independent variable and a dependent variable.