A logo of a tower and a book

Description automatically generated

A logo of a computer company

Description automatically generated

**AI-Generated Media Detection System**

Supervised by Dr. **Eman Abdel-Latef**

|  |  |  |
| --- | --- | --- |
| Program Name | | |
| □ Computer Science  □ Information Systems | | **□ Scientific Computing**   * **Artificial Intelligence** |
| Project Title | | |
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ABSTRACT

years have made the difficulty of differentiating between the media (images or text) generated by generative adversarial networks (GANs) , Transformers or large language models (LLMs) that closely resemble the real thing has increased, particularly with the remarkable development of GANs or LLMs and the rapid advancement of artificial intelligence. And this started performing this duty better than expected. In the upcoming years, a major development is anticipated. This raises many questions: What if these models are used in a negative and harmful way? What would happen if people used it to create fake images for social media scams? Or how will this affect the level of the educational process for many people by making these models perform academic tasks, making it difficult for the teacher to evaluate students correctly? More and more of these questions and problems can arise as that continue to develop.

So, in this project, we are working hard to help figuring out whether this content (images or text) is generated or processed by powerful AI models (LLMS or GANs) or by human.

**LIST OF** **ACRONYMS/ABBREVIATIONS**

|  |  |
| --- | --- |
| ACRONYM | Definition of Acronym |

# Chapter One

# project initiation

* 1. problem DEFINITION

Companies like OpenAI, Meta, Microsoft, and Google are racing ahead in AI, particularly in things like transformers, GANs, and LLMs. They're all competing fiercely because they want to lead this tech revolution. Each one knows that AI will shape the future, so they're striving to create the best models that can generate amazing content. For instance, OpenAI has ChatGPT, Meta developed Llama, Microsoft has Bing, and Google created Gemini. It's a race to be at the forefront of this game-changing technology.

New types of AI, like Generative Adversarial Networks (GANs) and Transformers, have made huge improvements in creating realistic images. But because it's getting harder to tell fake AI-generated made images from real ones, there's a rise in problems like fake profiles, scams, and spreading lies. Just like with fake news, we need smart tools to spot these fake images. It's super important to have ways to check if a picture was made by a computer or a person. This helps us keep trust in what we see online.

Large language Models (LLMs) can write things that are exactly like what people write. But it is difficult to know whether words come from a person or a machine. This can be a problem for teachers who are checking whether students have done their own work or used these forms to finish assignments.

These large language models create text that looks almost exactly like what people write. This is great for a lot of things! But it also brings new problems. Therefore, we will make tools to find out whether text was generated by artificial intelligence (LLMs) or by a person.

Open-source technology that generates text and images has become so advanced that it's hard to tell what's made by machines or people. Bad actors use this to create convincing fake content, which makes it super important to have strong systems that can spot the difference between what's made by a machine and what's made by a human.

* 1. problem SOLUTION

We will build a website containing our detector models. It contains detector models, which are: A model for detecting images generated using ai, and a special model for detecting images whose features have been manipulated using ai and a text detector model that was generated by ai. We made it a website to make it easier for everyone to use.

## 

* 1. project objective

To develop a website utilizing machine learning and data processing techniques to detect images and texts generated by AI, aiming to:

1. **Identify AI-Generated Content**: Distinguish images and texts generated by AI models, such as those produced by neural networks.
2. **Differentiate Human-Created Content from AI**: Differentiate natural human-generated content from AI-generated content to verify credibility and authenticity.
3. **Provide a User-Friendly Interface**: Offer an intuitive user interface for users to upload images and texts for analysis, presenting analysis results in an easily understandable format.
4. **Develop Machine Learning Models**: Construct accurate and efficient machine learning models capable of identifying and categorizing suspicious images and texts.
   1. stakeholder list

* **User**: who uses this website to detect images and texts generated by AI
* **Admin**: who manage user account and profile
  1. proposed scope

**1. Key Features:**

* AI-Generated Image Detection: Identifying images created by AI and distinguishing them from human-created images.
* AI-Generated Text Detection: Identifying text generated by AI and discerning it from human-generated text.

1. **Core Requirements:**

* **Machine Learning Model Development**: Building ML models capable of differentiating AI-generated images and texts from human-created ones.
* **Data** **Collection** and Categorization: Gathering a substantial dataset with examples of AI-generated and human-generated images and texts for model training.
* **User** **Interface** Development: Creating a user-friendly interface for users to upload images or texts for analysis.

**3. Scope Exclusions:**

* **Privacy** **and** **Security** **Measures**: Ensuring user data remains secure and doesn’t violate privacy standards.
* **Technical** **Challenges**: Addressing difficulties in detecting advanced, hidden AI techniques.
  1. project constraints
* **Time Limitations**: Fixed deadlines or timeframes for project completion that might affect the depth of development or testing phases.
* **Resource Constraints**: Limited budget for acquiring necessary tools or technologies, or constraints on available workforce.
* **Technological Limitations**: Mandated use of specific programming languages, frameworks, or restrictions on employing certain AI models due to compatibility issues.
* **Regulatory Compliance**: Adherence to data protection laws, privacy regulations, or ethical guidelines governing the use of AI-generated content.
* **Scope Creep Management**: Ensuring the project remains focused on its defined objectives without expanding beyond the established scope.

# 

# Chapter Two

**System analysis And Design**

# System analysis And Design

* 1. User and System Requirements

### Functional Requirements

1. **User** **Authentication**:

- Users can sign up with a valid email address, name, and password.

- Users can log in using their credentials.

2. **Media** **Submission**:

- Users can choose the type of media (text, image, or deep fake).

- Users can submit the media (upload text or image).

3. **Subscription**:

- Users can subscribe to a plan.

- Subscription plans are presented to the user.

- Users can select a plan.

- Users must pay for the selected plan.

4. **Profile** **Management**:

- Users, after logging in, can view their profile page.

- Users can edit their profile information.

5. **History**:

- Users can view a history page that displays their past interactions or submissions.

6. **Admin** **Functions**:

- Admins can log in.

- Admins can observe system data and analysis.

- Admins have access to an admin page.

7. **Detection** **System**:

- The system can detect AI-generated content.

- The system records the date and result of the content analysis.

### Non-functional Requirements

**1. Security:**

- User passwords are securely stored (hashed and salted).

- Media submissions are securely handled to prevent unauthorized access.

**2. Usability:**

- The website has an intuitive and user-friendly interface.

- Responsive design for various devices and screen sizes.

**3. Performance:**

- The detection system should provide timely results.

- The website should handle simultaneous user requests efficiently.

**4. Scalability:**

- The system should be able to handle an increasing number of users and media submissions.

**5. Reliability:**

- The system should be available and reliable for users and admins.

**6. Payment Processing:**

- Secure and reliable payment processing for subscription plans.

**7. Logging and Auditing:**

- The system logs user actions, especially those related to media submissions and payments.

- Admins have access to detailed logs for analysis.

**8. Data Backup:**

- Regular backups of user data and system logs.

**9. User Notifications:**

- Users receive notifications for successful subscription, payment, and other important events.

**10. Compliance:**

- The system complies with relevant data protection and privacy regulations.

**11. User Support:**

- Provide a mechanism for users to seek help or support.

**12. Cancellation of Subscription:**

- Users can cancel their subscription, and the system should handle this process appropriately.

* 1. System Design

### context diagram

Figure

### use case diagram.

A diagram of a system

Description automatically generated

Figure

### ACTIVITY diagram

1. **Sign up activity**

A diagram of a software flowchart

Description automatically generated

Figure

1. **Sign in activity**

**A diagram of a system

Description automatically generated**

Figure

1. **Select media type activity.**

**A diagram of a computer program

Description automatically generated**

Figure

1. **Upload media activity**

A diagram of a system

Description automatically generated

Figure

1. **Detect Ai-generated Media activity.**

A diagram of a flowchart

Description automatically generated

Figure

1. **Feedback activity**

A diagram of a problem

Description automatically generated

Figure

1. **Subscription activity**

A diagram of a sign up

Description automatically generated

Figure

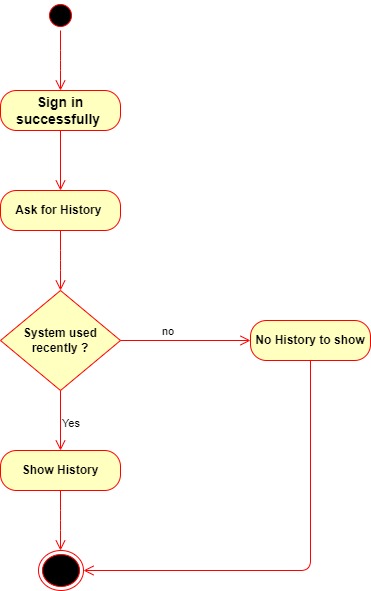
1. **Admin Management activity.**

A diagram of a software system

Description automatically generated

Figure

1. **Show History activity.**



Figure

1. **Edit Profile activity.**

A diagram of a flowchart

Description automatically generated

Figure

### Data flow diagram

**Level 0**

A diagram of a software server

Description automatically generated with medium confidence

Figure

**Level 1**

A diagram of a program

Description automatically generated

Figure

### Sequence diagram

A diagram of a construction project

Description automatically generated with medium confidence

Figure

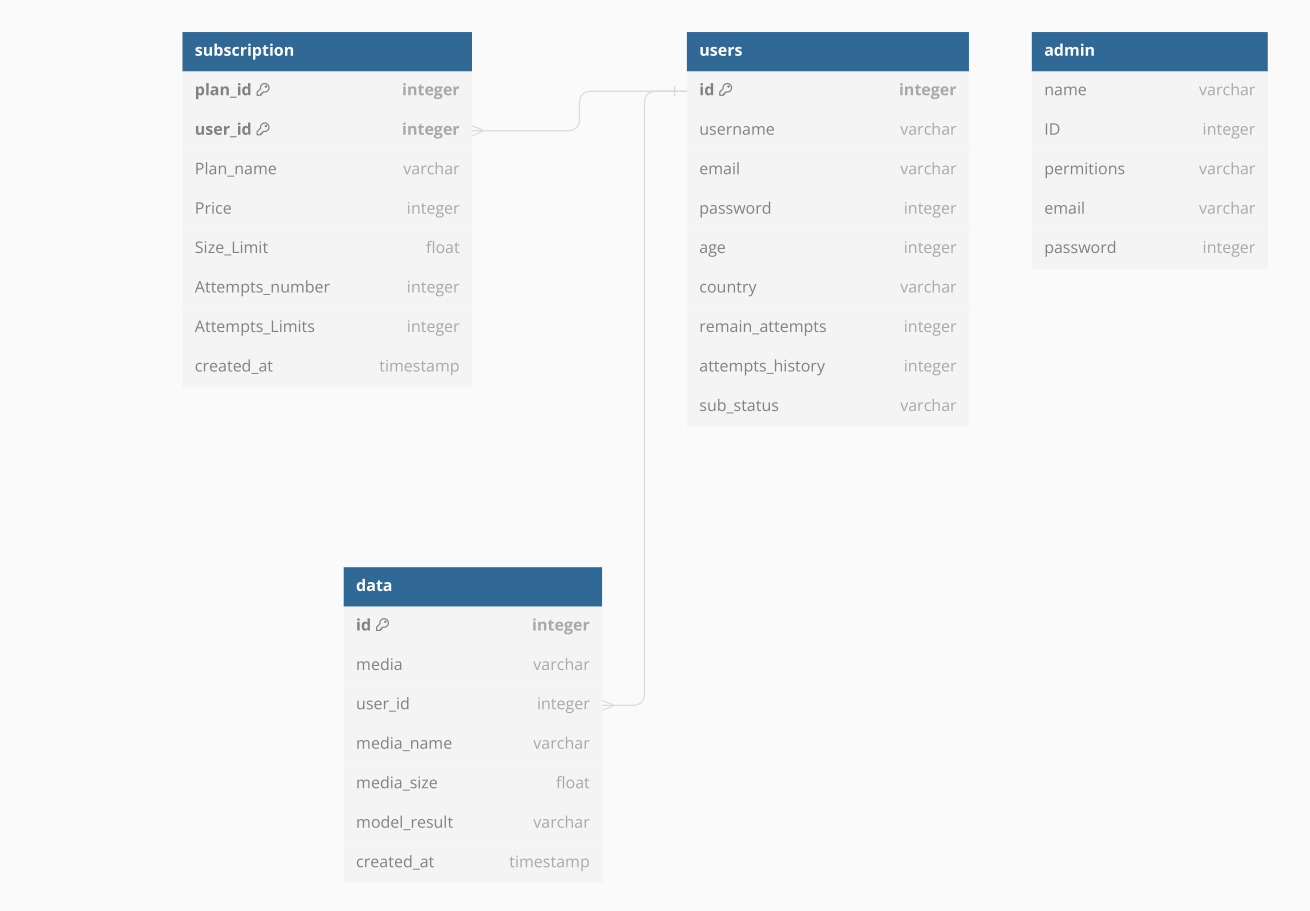
### class DIAGRAM

A diagram with text on it

Description automatically generated

Figure

### Database Design



Figure

### ERD DIAGRAM

A diagram of a diagram

Description automatically generated

Figure

## Used Technologies and tools.

### Technologies

### tools

# Chapter three

# Discussion and Conclusion

## Introduction

## Main Findings

## Why is this project important?

## Limitations

## Future Recommendation

## Conclusion Summary

# Chapter four

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