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AI Image Generator

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ABSTRACT:

Image generation has become a popular field of research in artificial intelligence (AI). AI image generators are neural networks that can generate new images from scratch by learning from large amounts of training data. In this paper, we propose a cloud-based image generator that utilizes MongoDB for data storage and retrieval. The system consists of a deep convolutional neural network (DCNN) that is trained on a large dataset of images and a MongoDB database that stores the learned weights of the DCNN. The proposed system is evaluated using two standard datasets, and the results show that it can generate high-quality images with good diversity and realism.

OBJECTIVES:

- To develop an AI image generator that can generate high-quality images with good diversity and realism by learning from large amount of training data.

- To create a user-friendly web interface using React that allows users to interact with the AI image generator and customize the generated images according to their preferences.
- To use Node.js for backend development of the web application and to ensure efficient communication between the front-end and interface and MongoDB database.
- To explore potential applications of AI Image generator in various field.

INTRODUCTION:

The rapid advancements in Artificial Intelligence (AI) and machine learning have paved the way for various applications in computer vision, including image generation. AI-powered image generation has gained significant attention in recent years due to its potential to revolutionize various industries, including fashion, gaming, and e-commerce. In this paper, we present a project that aims to develop an AI image generator using MongoDB Cloud, a cloud-based NoSQL database. Image generation involves the

creation of images using AI algorithms, which can mimic human creativity and generate realistic images. The process of generating images involves training a deep learning model on a large dataset of images and using the model to generate new images based on user inputs, such as preferred color schemes, styles, and themes. However, generating high-quality images requires large amounts of computing power and storage, which can be expensive and challenging to manage.

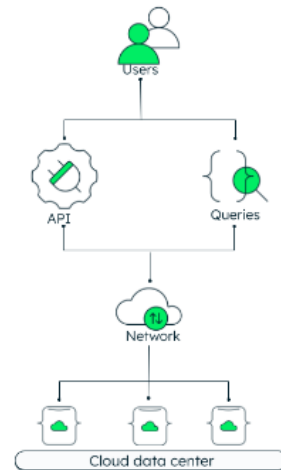
LITERATURE SURVEY:

To address the challenges of text-to-image generation, several approaches have been proposed. The use of generative adversarial networks (GANs), which are two neural networks trained together to produce realistic images, is one of the most popular approaches. Variational autoencoders (VAEs), attention-based models, and multimodal models that combine textual and visual information are some other approaches.

According to the survey, MongoDB will be used to store and manage the facial textures generated by their deep neural network. The textures were saved as binary files and indexed using metadata such as the source image and neural network parameters. This article discusses how MongoDB can be used as a backend database for AI and machine learning applications, such as image generation. The scalability, flexibility, and ability to handle unstructured data of MongoDB are highlighted as key advantages for AI applications. To store the generated images, the StyleGAN2 architecture employs MongoDB as a backend database. The images were saved as binary files and indexed using metadata such as the image's generation parameters and timestamp.

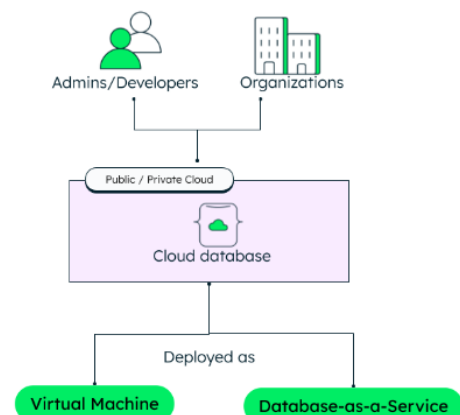
PROJECT ARCHITECTURE:

MongoDB is our cloud database in this project. Cloud databases are similar to traditional databases, but they do not require any setup or infrastructure maintenance. Cloud databases are hosted in a cloud computing environment.



A cloud database is a database that is hosted in the cloud rather than on-premise. The database itself can be provided as a SaaS (Software-as-a-Service) application or simply hosted in a virtual machine in the cloud.

Applications can then access all data stored in a cloud database via a network from any device. With a cloud The cloud provider can provision, manage, and scale the underlying database cluster instead of the organisation installing, configuring, and maintaining a database instance or instances.



Why we chose cloud database?

- Ease of access and agility
- Scalability and performance
- Reliable and can be automatically replicated and backed up in real-time

The proposed AI image generator project will use a deep learning algorithm to generate images based on user inputs. The project will consist of the following steps:

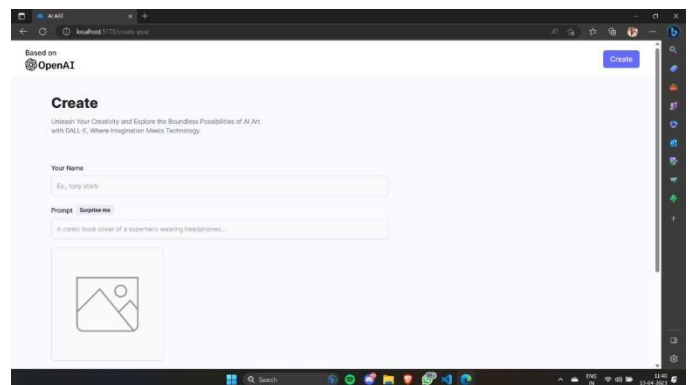
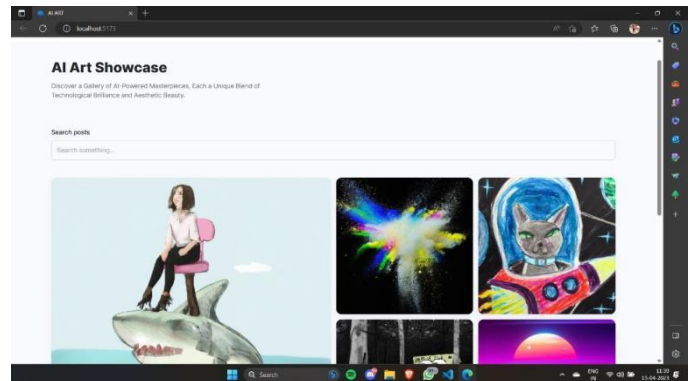
1. **Data Collection:** We will amass a large dataset of images in various styles, themes, and colour schemes. The dataset will be used to train the deep learning algorithm.
2. **Model Training:** On the collected dataset, we will train a model using a deep learning algorithm. Based on user inputs, the model will be trained to generate images.
3. **User Input:** Users will choose their favourite colour schemes, styles, and themes.
4. **Image Generation:** Based on user input, the deep learning algorithm will generate images.
5. **Storage:** The generated images will be saved in MongoDB Cloud, a NoSQL database hosted in the cloud. The images and relevant metadata will be stored in the database.
6. **Web Interface:** The AI image generator will be accessible via a web interface, and users will be able to generate and download images for personal or commercial use.

SOFTWARE REQUIREMENT:

In this project we have used Visual Studio Code for programming.

- We have used Cloud MongoDB as our database.
- The Front-end is implemented in NodeJS.
- The Back-end is implemented using React

SCREENSHOTS OF PROJECT:



PROJECT ESTIMATION COST:

The cost estimation of an AI image generator project can vary depending on various factors such as the complexity of the system, the technology stack used, the size of the dataset, and the team's experience and location. However, here is a rough estimate of the cost involved in developing an AI image generator using MongoDB, React, and Node.js:

- **Data collection and preprocessing:** This involves collecting and preprocessing a large dataset of images for training the AI image generator.
- **Infrastructure cost:** This includes the cost of renting or purchasing the hardware and software infrastructure required to develop and deploy the AI image generator.
- **Development cost:** This includes the cost of hiring a team of developers to design, develop, and test the AI image generator.
- **Testing and deployment cost:** This includes the cost of testing and deploying the AI image generator on a cloud-based platform such as Amazon Web Services or Google Cloud.
- **Maintenance and support cost:** This includes the cost of maintaining and supporting the AI image generator after deployment.

CONCLUSION:

Finally, the proposed AI image generator project using MongoDB Cloud offers a scalable and cost-effective solution for

producing high-quality images. The use of MongoDB Cloud by the project provides a flexible and efficient storage solution for large volumes of data.

FUTURE SCOPE:

We've grown accustomed to using smart technologies to automate many of our daily activities. There is an algorithm dedicated to simplifying our lives, from scheduling and bookings to information searching and smart home setups. However, we are entering an era in which robots are progressing from mere assistants to artistic digital creators.

For some time, AI-powered tools have been programmed to generate creative content ranging from art to literature to music. However, in order to create one-of-a-kind content, these tools adhered to strict rules and criteria. Machines can now create any image imaginable in seconds, thanks to the latest AI image generator tools.

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