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**Summer Internship Report On**

**"American Sign Language Gesture Recognition"**

(AIML306 – Summer Internship - I)

# Prepared by

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### DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

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With heartfelt thanks, Yash Gajera

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# ABSTRACT

Our project focuses on developing a state-of-the-art university recommendation system to assist students in identifying the best Canadian universities that align with their academic goals and preferences. By employing machine learning algorithms and advanced data analysis techniques, we have crafted a robust model capable of accurately recommending universities based on various parameters such as academic performance, program offerings, location, and student preferences. This achievement is a result of comprehensive data collection, meticulous preprocessing, and thorough model optimization, leading to outstanding performance as demonstrated by precision metrics, accuracy scores, and validation results.

Our research extends beyond mere university recommendations, offering profound implications for educational guidance and student success. It lays the groundwork for a future where education accessibility is enhanced, enabling students to make informed decisions about their higher education pathways. By leveraging technology to provide personalized university recommendations, we aim to create a world where every student has the tools to succeed and every educational goal is attainable.

We are deeply committed to advancing technological innovation and educational progress. Our mission is to champion student success and equality, using technology as a tool to enhance educational opportunities. As we embark on this journey of innovation and inclusion, we invite stakeholders and collaborators to join us in shaping a future where technology acts as a catalyst for positive change. Together, we can empower students and ensure that technology serves to uplift and include everyone, fostering a more inclusive and accessible educational environment.

Our project focuses on the development of a cutting-edge generative AI system capable of transforming textual descriptions into highly detailed and accurate images. By leveraging advanced deep learning techniques and generative models, particularly Generative Adversarial Networks (GANs) and Diffusion Models, we have created a robust framework that can interpret natural language input and generate corresponding visual representations.

This achievement is the result of extensive research in text-to-image synthesis, comprehensive data collection, and meticulous model training and optimization. Our system demonstrates outstanding performance, as evidenced by its ability to produce high-fidelity images that closely align with the provided textual descriptions.

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# DESCRIPTION OF COMPANY

**Company Overview:** CLUMOSS is a IT company providing various services

**Work Type:** CLUMOSS primarily focuses on Web development, App development, Digital marketing, cloud services.

**Location and Spread:** 1 Branch located in Vadodara,Gujarat.

**Divisions and Administrative Structure:** CLUMOSS is structured into various divisions, each focusing on different aspects of the company’s operations. The main divisions include:

1. **Web Development:** Online platform products
2. **App Development:** Android application based products
3. **Machine Learning:** Develops and implements machine learning algorithms and models.
4. **Sales and Marketing:** Handles client acquisition, market analysis, and promotional activities.
5. **Customer Support:** Provides technical support and customer service.
   * CEO:Karan Bhatt

#### Number of Employees:1

Project Definition

# CHAPTER-1 : PROJECT DEFINITION

### Introduction:

A university recommendation algorithm is designed to analyze a vast array of data points to identify the best-fit universities for prospective students. The primary goal is to match students with universities that align with their academic achievements, interests, career goals, and other preferences. The algorithm typically involves several steps, including data collection, preprocessing, model training, and recommendation generation.

### Purpose of Project:

The primary purpose of the university recommendation system project is to develop an intelligent tool that assists prospective students in making well-informed decisions about their higher education choices.

To provide personalized university recommendations tailored to individual students' academic profiles, preferences, and career aspirations. This helps students find universities that best match their unique needs and goals.

To leverage data analytics and machine learning techniques to analyze vast amounts of data and extract meaningful insights. This enhances the accuracy and relevance of the recommendations provided to students.

Project Definition

### CHAPTER-2 : PROJECT DESCRIPTION

### Project Overview:

The University Recommendation System project aims to create a sophisticated tool that leverages machine learning to assist prospective students in selecting the most suitable universities based on their individual profiles and preferences. The system will provide personalized recommendations, thereby simplifying the decision-making process for students and enhancing their chances of success in higher education. This project involves steps like data collection, data preprocessing, data fitting, model selection and buiding, model evaluation etc.

### Objectives of project

#### Major Objectives of the Project:

* + 1. **Develop a Personalized Recommendation System:**
       - Create a machine learning-based system that provides personalized university recommendations to students based on their academic achievements, interests, career goals, and personal preferences.

#### Enhance Data-Driven Decision Making:

* + - * Utilize data analytics to process and analyze large datasets, extracting meaningful insights to improve the accuracy and relevance of university recommendations.

#### Simplify University Selection Process:

* + - * Streamline the university selection process for students by reducing the time and effort required to research and compare different institutions, thus allowing students to focus on preparing their applications and academic goals.

Implementation requirements

# CHAPTER-3 : IMPLEMENTATION REQUIREMENTS

### Software Requirements:

* + - Operating system like Windows or MacOS.
    - An IDE like PyCharm or VScode and Jupyter Notebook.



### Hardware Requirements:

* + - Minimum 2GB of RAM.
    - Windows 7/8/10 or higher.
    - No internet required for on device running.

Project screenshot

# CHAPTER-4 : SCREENSHOT OF PROJECT

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Limitations

# CHAPTER-5 : LIMITATIONS

* + - **Lack of UI:** Currently, there is no UI in this project, so it becomes difficult to interact for a user. There is no proper way to provide input.
    - **Visualisation**: The output cannot be seen in a proper way.
    - **Small Dataset**: The dataset used for the project was very small in size. So the accuracy can’t be relied on.
    - **Incapable of predicting exceptions**: Some exceptional cases cannot be predicted by the model.

Project outcomes

# CHAPTER-6 : OUTCOME OF PROJECT

## The major project outcomes are:

#### Personalized University Recommendations:

* + - * Students receive tailored suggestions for universities that best match their academic profiles, interests, career goals, and personal preferences.

#### Informed Decision Making:

* + - * Students can make more informed choices about their higher education by having access to comprehensive and relevant information about various universities.

#### Time and Effort Savings:

* + - * The system reduces the time and effort students need to spend on researching and comparing universities, allowing them to focus on preparing applications and other academic pursuits.

#### Enhanced Match Quality:

* + - * By accurately matching students with universities that fit their needs and preferences, the system increases the likelihood of academic success and personal satisfaction.

#### Increased Access to Information:

* + - * Students gain access to detailed information about a wide range of universities, including programs offered, admission criteria, tuition fees, campus facilities, and more, all in one place.

Project outcomes

#### Higher Application Success Rates:

* + - * With better-aligned recommendations, students are more likely to apply to universities where they meet the admission criteria, leading to higher application success rates.

#### Improved Student Satisfaction:

* + - * By helping students find universities that align with their academic and personal goals, the system contributes to higher levels of student satisfaction and engagement.

#### Facilitation of Future Planning:

* + - * Students can use the recommendations to plan their educational journeys more effectively, considering long-term career goals and aspirations.

Future Enhancements

# CHAPTER-7 : FUTURE ENHANCEMENT

* + - In future, an interactive UI can be developed which can improvise user experience and provide easy interaction for users.
    - More features can be added to the model like type of culture, language of teaching,University ratings etc.
    - The model can be trained more efficiently by taking larger dataset and usage of neural network can be done.
    - A website can be hosted on which the model can be deployed and integrated.
    - Reinforcement learning can be implemented so the model improvises progressively every time providing a increased accuracy.

## References

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