



FINAL YEAR PROJECT REPORT

TEXT TO IMAGE CONVERSION WITH AI

**In fulfillment of the requirement
For degree of
BS (COMPUTER SCIENCES)**

By

**MUNEEB UR REHMAN
HARIS IMTIAZ
SM. FAIZAN KAZMI**

**67771 (BSCS)
54408 (BSCS)
67784 (BSCS)**

SUPERVISED

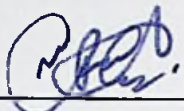
**BY
DR. ASIF AZIZ**

BAHRIA UNIVERSITY (KARACHI CAMPUS)

FALL-2023

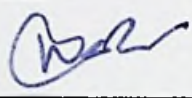
DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Signature :  _____

Name : MUNEEB UR REHMAN

Reg No. : 67771

Signature :  _____

Name : HARIS IMTAIZ

Reg No. : 54408

Signature :  _____

Name : SYED MUHAMMAD FAIZAN KAZMI

Reg No. : 67784

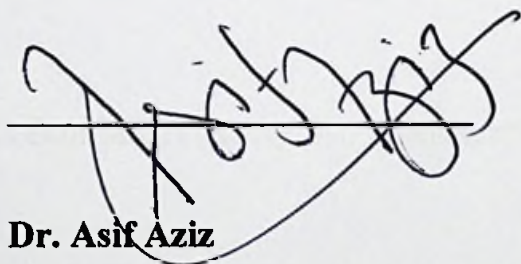
Date : 01/2/2024

APPROVAL FOR SUBMISSION

We certify that this project report entitled **“TEXT TO IMAGE CONVERSION WITH AI”** was prepared by **Muneeb Ur Rehman, Haris Imtiaz, Syed Muhammad Faizan Kazmi** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science in Computer Science at Bahria University.

Approved by,

Signature :



Supervisor: **Dr. Asif Aziz**

Date :

01/02/2024

The copyright of this report belongs to Bahria University according to the Intellectual Property Policy of Bahria University BUORIC-P15 amended on April 2019. Due acknowledgement shall always be made of the use of any material contained in, or derived from, this report.

© 2023 Bahria University. All right reserved.

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express my gratitude to my research supervisor, DR Asif Aziz for his invaluable advice, guidance and his enormous patience throughout the development of the research.

In addition, we would also like to express my gratitude to our loving parent and friends who had helped and given me encouragement.

TEXT TO IMAGE CONVERSION WITH AI

ABSTRACT

In this final year project, we're diving into the exciting world of turning words into pictures using Generative Adversarial Networks (GANs) and Convolutional Neural Networks (CNNs). It's like teaching a computer to understand what you're describing and making a picture out of it – a mix of art and technology that's super fascinating!. Generative Adversarial Networks (GANs) work like a team of two friends. One friend, the "generator," tries to make pictures from the words you tell it. The other friend, the "discriminator," checks if those pictures look real or not. As they practice, the computer gets really good at creating pictures that match your words. And then there's Convolutional Neural Networks (CNNs), which are like the computer's eyes – they help it see shapes and colours in the pictures. We're digging into how GANs and CNNs team up to make this happen. We're figuring out how the computer learns to change words into images that make sense. This could be a big help for artists, designers, and anyone who wants to show their ideas as pictures without drawing or taking photos. Our project is like showing computers how to become artists, turning words into pictures in a whole new way. In this project, Exploring all about GANs and CNNs, and how they work together to create something cool. The process sharing the steps of how the computer goes from understanding your words to making pictures that match them. This kind of skill could change the way we make pictures and bring thoughts to life. Our project is a journey into a world where computers can understand and create from words – an adventure where technology and creativity meet.

TABLE OF CONTENTS

DECLARATION	ii
APPROVAL FOR SUBMISSION	iii
ACKNOWLEDGEMENTS	v
ABSTRACT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF SYMBOLS	xiii
LIST OF APPENDICES	xiv

CHAPTER

1. INTRODUCTION	1
1.1 Background	1
1.2 Problem Statements	1
1.3 Aims and Objectives	2
1.4 Scope of Project	2
2. LITERATURE REVIEW	3
2.1 Background	3
2.2 Generative adversarial networks	4
2.3 Deep symmetric structured joint embedding	4
2.4 Related Work	5
3. REQUIREMENT SPECIFICATIONS	10
3.1 Existing System	10
3.2 Proposed System	10
3.3 Requirement Specifications	11
3.3.1 Functional Requirements	11
3.3.2 Non-Functional Requirements	11

3.4	Use Cases	12
4.	DESIGN AND METHODOLOGY	13
4.1	Proposed Methodology	13
4.2	Process Model	14
4.3	Generator and Discriminator	15
4.4	Backpropagation	17
4.5	Generator diminished gradient	17
4.6	Loss Functions	18
4.7	Minimax Loss	18
4.8	Wasserstein Loss	18
4.9	Critic Loss	19
4.10	Generator Losses	19
4.11	System Architecture Block Diagram	19
4.12	Database Design (ERD)	20
4.13	Use Case	21
4.14	Mock-up	21
5.	SYSTEM IMPLEMENTATION	29
5.1	Design Diagram	29
5.2	Data Collection	33
5.3	Data re-processing	34
5.4	Training	35
5.5	Risk Analysis	36
5.6	Mitigation	40
5.6.1	Performance	40
5.6.2	Response and Effectiveness	40
5.6.3	Coding	40
5.6.4	Response and Effectiveness	40
5.6.5	Human factors	41
5.6.6	Response and Effectiveness	41
5.6.7	Hardware Constraints	41
5.6.8	Response and Effectiveness	41

5.6.9	Scalability	42
5.6.10	Response and Effectiveness	42
6.	SYSTEM TESTING AND EVALUATION	43
6.1	Testing plan	43
6.2	Test environment	45
6.3	List of different captions of a image	46
6.4	Test team details	47
6.5	Error and exception handling	47
6.6	Limitations of the solution	47
7.	CONCLUSION	48
7.1	Conclusion discussion	48
7.2	Future Work	49
	REFERENCES	50
	APPENDICES	53