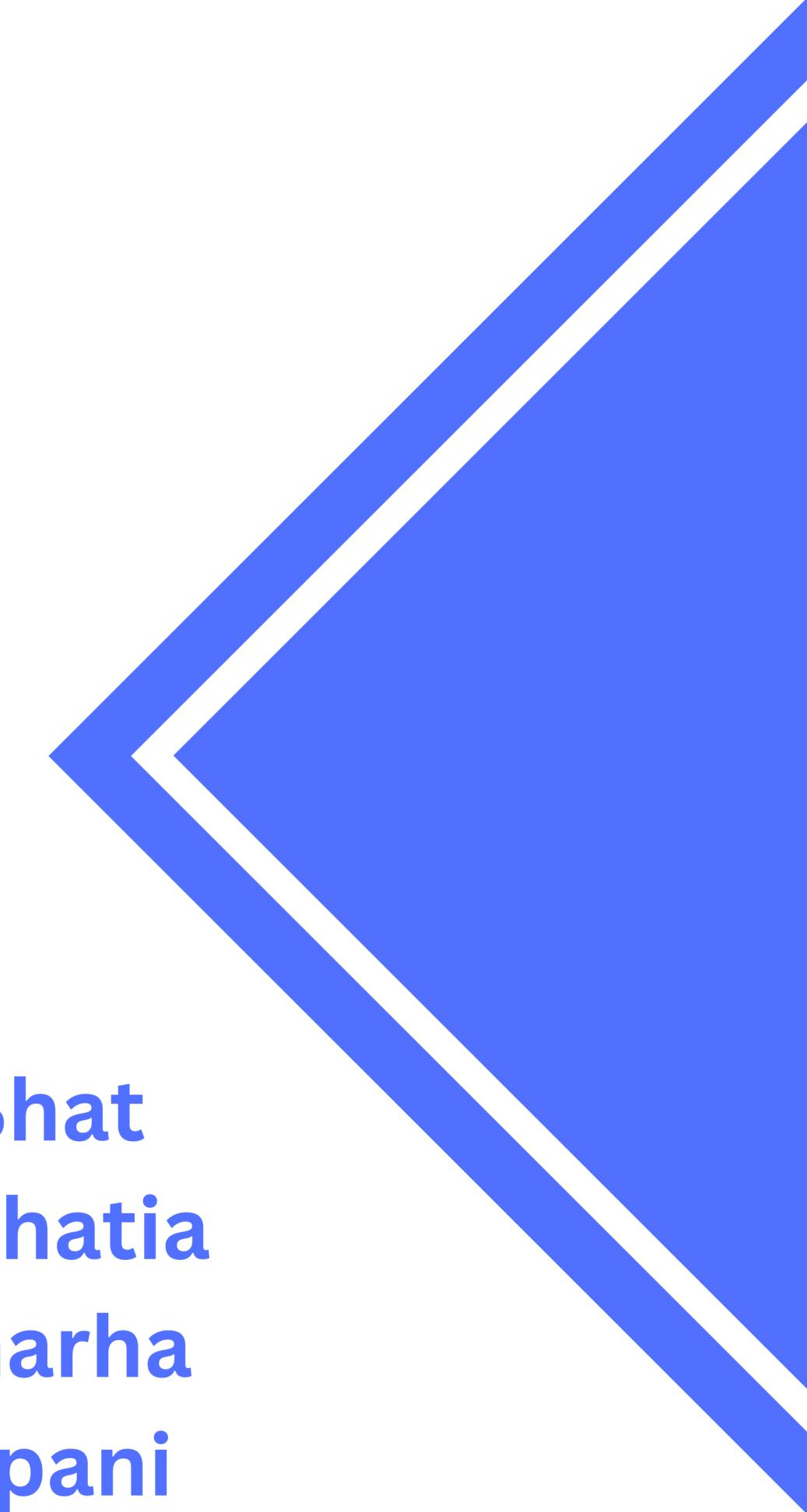


# **SKIN CANCER PREDICTION WITH DEEP LEARNING**



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# ABSTRACT

IN THIS STUDY, WE PROPOSE A MACHINE LEARNING MODEL FOR THE AUTOMATED DETECTION OF SKIN DISEASES. THE MODEL IS BUILT UPON A CONVOLUTIONAL NEURAL NETWORK (CNN) ARCHITECTURE TO CAPTURE INTRICATE FEATURES FROM SKIN LESION IMAGES. THE PROPOSED SYSTEM AIMS TO AID HEALTHCARE PROFESSIONALS IN EARLY DIAGNOSIS AND INTERVENTION, PROVIDING WITH NATURAL REMEDIES FOR THE PROBLEM AND ALSO AP. THUS IMPROVING PATIENT OUTCOMES AND REDUCING THE BURDEN ON HEALTHCARE SYSTEMS.

# INTRODUCTION

SKIN DISEASE PREDICTION THROUGH DEEP LEARNING REPRESENTS A TRANSFORMATIVE LEAP IN HEALTHCARE. BY HARNESSING THE POWER OF ADVANCED ALGORITHMS AND EXTENSIVE DATA ANALYSIS, THIS INNOVATIVE APPROACH OFFERS ACCURATE, SWIFT, AND COST-EFFECTIVE DIAGNOSES. TRADITIONAL METHODS OFTEN FACE LIMITATIONS, BUT MACHINE LEARNING ALGORITHMS EXCEL AT RECOGNIZING PATTERNS IN VAST DATASETS OF SKIN IMAGES AND PATIENT INFORMATION.

# **PROBLEM STATEMENT**

**DEVELOP A DEEP LEARNING MODEL FOR  
SKIN CANCER DETECTION USING IMAGE-  
BASED PROCESSING TO ACCURATELY  
CLASSIFY DERMATOLOGICAL CONDITIONS,  
FOR VARIOUS SKIN CANCER.**

# OBJECTIVES

1. **EARLY DETECTION:** IDENTIFY SKIN DISEASES AT AN EARLY STAGE TO IMPROVE TREATMENT OUTCOMES AND REDUCE THE SEVERITY OF CONDITIONS.
2. **ACCURACY:** ACHIEVE HIGH ACCURACY IN DISEASE PREDICTION TO MINIMIZE MISDIAGNOSES AND ENSURE RELIABLE RESULTS.
3. **SPEED:** PROVIDE RAPID DIAGNOSES TO REDUCE WAITING TIMES FOR PATIENTS AND IMPROVE THE EFFICIENCY OF HEALTHCARE SYSTEMS.
4. **COST-EFFECTIVENESS:** OFFER A COST-EFFECTIVE ALTERNATIVE TO TRADITIONAL DIAGNOSTIC METHODS, MAKING HEALTHCARE MORE ACCESSIBLE.
5. **PATIENT EDUCATION:** EDUCATE PATIENTS ABOUT THEIR SKIN CONDITIONS, SYMPTOMS, AND POTENTIAL TREATMENTS TO ENHANCE SELF-CARE AND AWARENESS..

# CNN MODEL USED:

- 1. XCEPTION:** IT IS KNOWN FOR ITS DEPTHWISE SEPARABLE CONVOLUTIONS, WHICH IMPROVE COMPUTATIONAL EFFICIENCY AND PARAMETER REDUCTION WHILE MAINTAINING MODEL PERFORMANCE, INSPIRED BY THE "INCEPTION" ARCHITECTURE.
- 2. DENSENET:** IT INTRODUCES THE CONCEPT OF DENSE CONNECTIONS BETWEEN LAYERS, WHERE EACH LAYER RECEIVES INPUT FROM ALL PRECEDING LAYERS IN A FEED-FORWARD FASHION. THIS CONNECTIVITY PATTERN LEADING TO IMPROVED LEARNING AND PARAMETER EFFICIENCY.
- 3. RESNET-50:** RESNET-50 IS PART OF THE RESNET (RESIDUAL NETWORK) FAMILY OF ARCHITECTURES, KNOWN FOR INTRODUCING RESIDUAL CONNECTIONS THAT ALLEViate THE VANISHING GRADIENT PROBLEM. IT CONSISTS OF 50 LAYERS AND EMPLOYS SKIP CONNECTIONS

# SYSTEM REQUIREMENTS

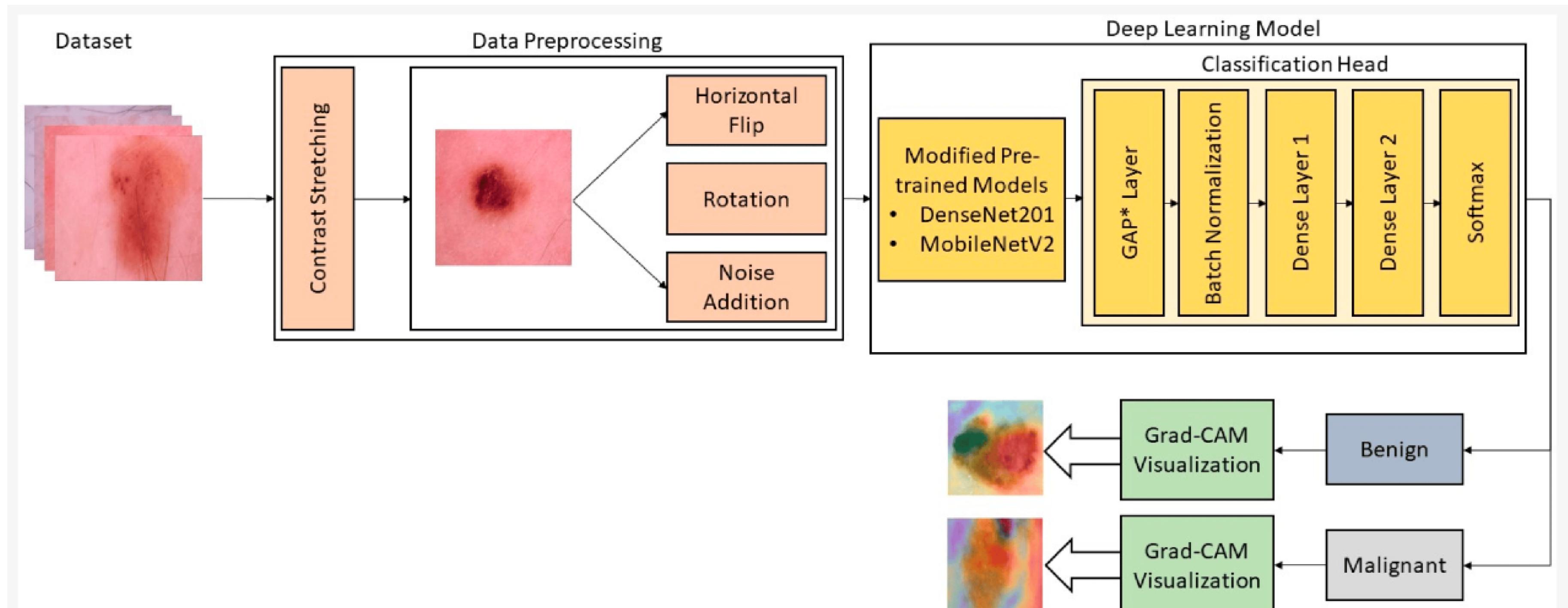
## HARDWARE AND SOFTWARE REQUIREMENTS:

GPU (GRAPHICS PROCESSING UNIT): AT LEAST 8GB VRAM A QUAD-CORE CPU, SUCH AS AN INTEL CORE I7 OR EQUIVALENT AMD RYZEN PROCESSOR RAM : 16GB ROM: SSD 256GB GOOGLE COLLAB WEB BROWSER (CHROME) OPERATING SYSTEM: OSS LIKE WINDOWS, >. 7. MACOS, OR LINUX FOR DEEP LEARNING PROJECTS CAN BE USED

# LIMITATIONS

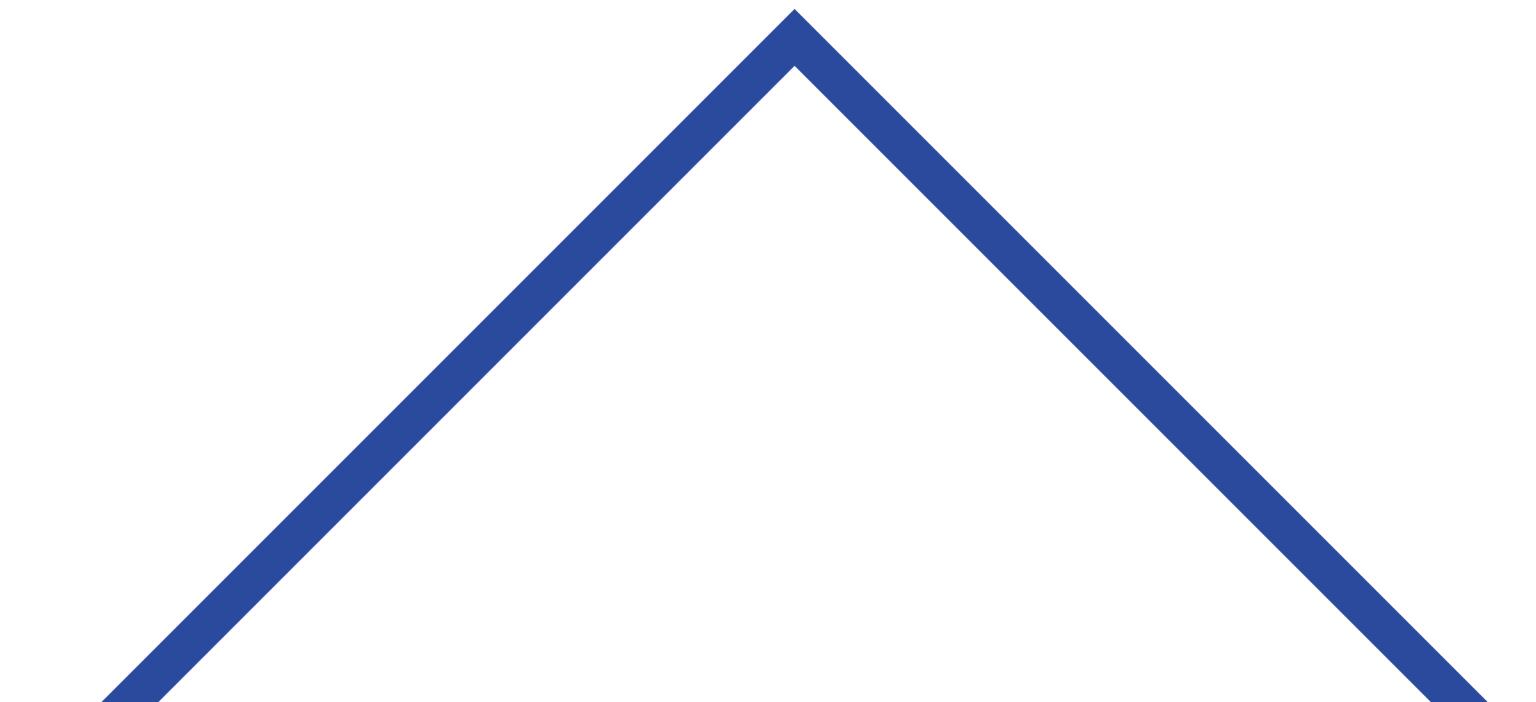
1. OTHER MODELS USES ONLY ONE VARIABLE FOR CLASSIFICATION AND DETERMINING THE RESULTS.
2. NOT USING AUTHORIZED DATSETS FROM RANDOM SOURCES SUCH AS KAGGLE.WHEREAS WE HAVE USED HAM10000. IT CONSISTS OF 10,015 DERMATOSCOPIC IMAGES OF VARIOUS PIGMENTED SKIN LESIONS, INCLUDING COMMON TYPES LIKE MELANOMA, NEVUS, AND SEBORRHEIC KERATOSIS. THIS DATASET IS COLLECTED FROM DIFFERENT SOURCES AND ENCOMPASSES A WIDE RANGE OF SKIN CONDITIONS, PROVIDING A DIVERSE SET OF IMAGES FOR TRAINING AND EVALUATION OF SKIN DISEASE DETECTION ALGORITHMS.

# ALgorithm Flow-



# RESOURCES

- [1] K. MADER, "SKIN CANCER MNIST: HAM10000," KAGGLE, 2018. [ONLINE]. AVAILABLE: [HTTPS://WWW.KAGGLE.COM/DATASETS/KMADER/SKIN-CANCER-MNIST-HAM10000](https://www.kaggle.com/datasets/kmader/skin-cancer-mnist-ham10000). [ACCESSED: JULY 20, 2023].
- [2] HARVARD UNIVERSITY, " THE HAM10000 DATASET", HARVARD DATAVERSE, DOI: 10.7910/DVN/DBW86T. [ONLINE]. AVAILABLE: [HTTPS://DATAVERSE.HARVARD.EDU/DATASET.XHTML?PERSISTENTID=DOI:10.7910/DVN/DBW86T](https://dataVERSE.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/dvn/dbw86t). [ACCESSED: JULY 28, 2023].



# **THANK YOU**