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# Artificial Intelligence Based Assistive Device for Alzheimer's Patients

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**ABSTRACT:** Alzheimer's disease poses significant challenges in recognizing familiar faces and remembering relationships, leading to distress and safety concerns for patients. This abstract outlines an advanced assistive system designed to alleviate these challenges by employing face recognition technology coupled with known/unknown person detection and notification alerts. The system utilizes state-of-the-art face recognition algorithms to identify and categorize familiar faces within the Alzheimer's patient's social circle. Through machine learning techniques, it establishes a personalized database of known individuals, including family members, friends, and caregivers. Moreover, the system employs robust detection mechanisms to differentiate between known and unknown individuals encountered by the patient in real-time notification alerts, this assistive system aims to enhance the safety and well-being of Alzheimer's patients.

## I. INTRODUCTION

Alzheimer's disease is a progressive neurological disorder that primarily affects older adults, characterized by a decline in cognitive abilities and memory loss. This disease is the most common form of dementia, accounting for 60-80% of dementia cases. The exact cause of Alzheimer's disease is not fully understood, but it is believed to involve a complex interplay of genetic, environmental, and lifestyle factors. The hallmark of Alzheimer's disease is the accumulation of two types of abnormal protein deposits in the brain: beta-amyloid plaques and tau tangles. These buildups interfere with normal neuronal function, leading to the gradual death of brain cells and the shrinking of brain tissue. As a result, individuals with Alzheimer's experience a decline in memory, thinking skills, and eventually, the ability to carry out daily task.

## II. LITERATURE SURVEY

**2.1 TITLE: Cognitive Decline Detection for Alzheimer's disease Patients through an Activity of Daily Living (ADL)**
AUTHOR: G. Palacios-Navarro
YEAR: 2022
DESCRIPTION:
This study aimed at evaluating the effectiveness and usefulness of a task based on an activity of daily living (ADL) for the detection of cognitive impairment for an Alzheimer's disease (AD) population.

**2.2 TITLE: Early Detection of Alzheimer's disease with Blood Plasma Proteins Using Support Vector Machines**
AUTHOR: Chima S. Eke, Emmanuel Jammeh
YEAR: 2021

**DESCRIPTION:**
The successful development of amyloid-based biomarkers and tests for Alzheimer's disease (AD) represents an important milestone in AD diagnosis. However, two major limitations remain.

**2.3 TITLE: Resting State fmri And Improved Deep Learning Algorithm for Earlier Detection of Alzheimer's Disease**
AUTHOR: Haibing Guo, Yongjin Zhang
YEAR: 2020
**DESCRIPTION:**
The development of computerized healthcare has been powered by diagnostic imaging and machine learning techniques. In particular, recent advances in deep learning have opened a new era in support of multimedia healthcare distribution. For earlier detection of Alzheimer's disease, the study suggested the Improved Deep Learning Algorithm (IDLA) and statistically significant text information.

## III. EXISTING SYSTEM

Existing system implements deep learning based tool for AD diagnosis and prediction. This abstract outlines recent advancements in utilizing deep learning techniques, including recurrent neural networks (RNNs), to analyze various medical data modalities such as neuroimaging, genetic markers, and clinical records for early detection and prognosis of AD. Additionally, this approach have certain challenges in deploying deep learning models in clinical settings, including data privacy concerns, interpretability, and generalization to diverse populations. The challenges and limitations associated with DL-based AD diagnosis, including issues related to data scarcity, interpretability of model predictions, and generalization across diverse populations. Additionally explore potential ethical concerns, such as privacy risks and biases inherent in large-scale medical datasets.

**Disadvantages:**
- The data used to train deep learning models may be biased towards certain demographics or patient groups, leading to biased predictions.
- This can lead to poor generalization performance when applied to new and unseen data.
- Training model requires significant computational resources, including high-performance GPUs.

## IV. PROPOSED SYSTEM

The proposed system utilizing face recognition technology incorporates with Convolutional Neural Network (CNN) training to recognize and respond to familiar faces. Family members can upload images of themselves and the patient to train the system, enabling accurate facial recognition process. In the event that a patient goes missing, the system automatically activates. Using system cameras connected to the network, the AI system captures and processes facial images encountered by the patient. By leveraging face recognition algorithms, the system can distinguish between known and unknown individuals in real-time. When an unknown person is detected, an immediate alert notification is sent to registered family members via email id. This AI-based assistive system not only helps in locating missing patients but also provides ongoing support by enhancing safety and monitoring. By harnessing the power facial recognition technology, families can maintain a sense of security and confidence while caring for Alzheimer's. This transformative solution represents a remarkable advancement in leveraging AI for the benefit of those affected by cognitive impairments.

**Advantages**
- The system provides a layer of safety by monitoring the presence of known and unknown individuals around the patient.
- Real time monitoring for tracking patient movements and ensuring they are not in risky situations.
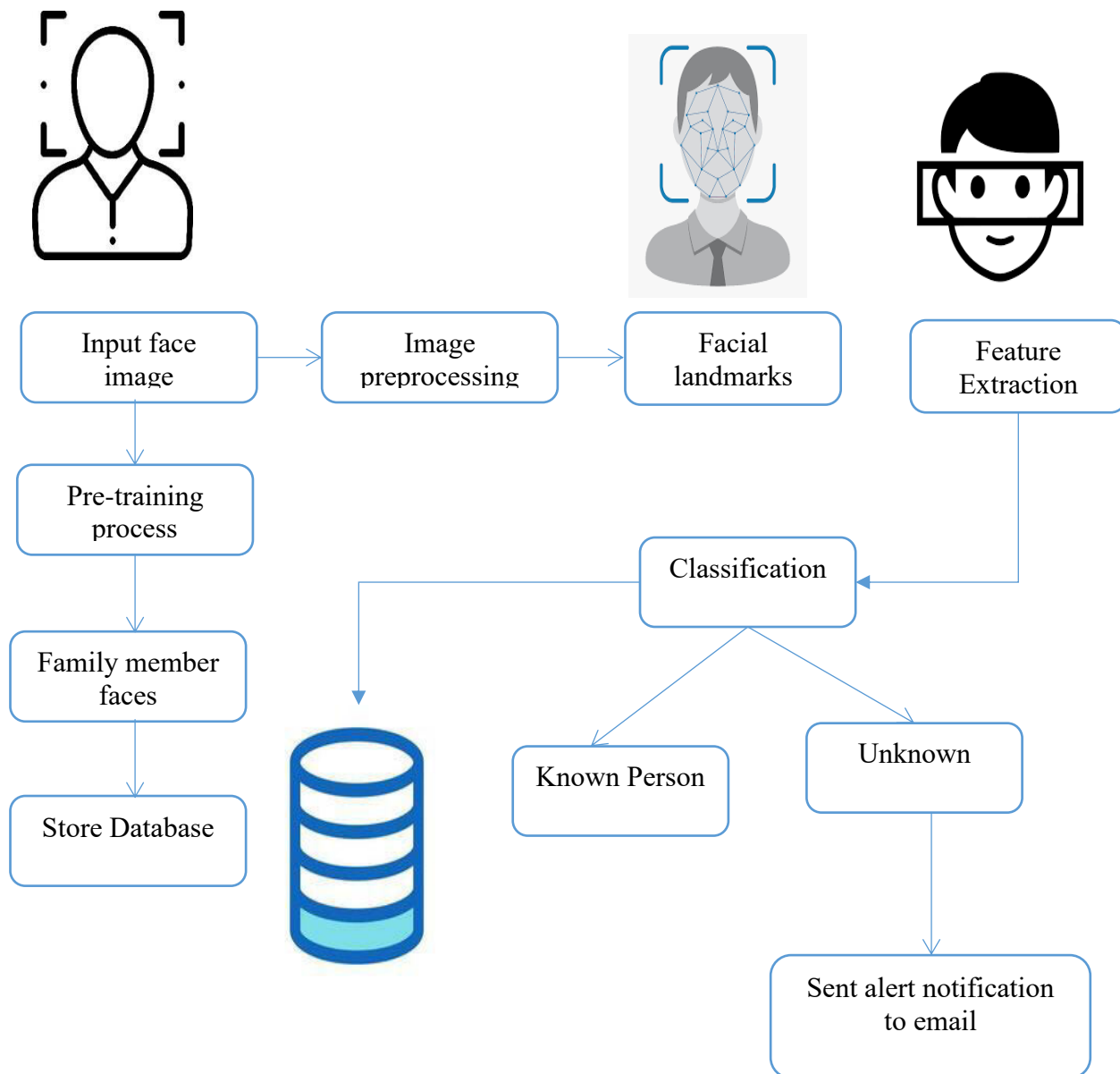
## V. CONCLUSION

The development of an Artificial Intelligence-based assistive system for Alzheimer's patients holds significant promise in improving their quality of life and ensuring their safety. By integrating features like face capture, training with family member faces, and known/unknown detection, this system can provide invaluable support. Through face recognition technology, it can identify familiar individuals, alerting the patient and providing a sense of reassurance and connection. Simultaneously, it can detect unknown faces, triggering alerts to family members or caregivers in case of potential risks or unfamiliar visitors. This proactive approach not only enhances the patient's security but also offers peace of mind to their loved ones. Moreover, by continuously learning and adapting through AI algorithms, the system can become increasingly effective over time, customizing its responses to the unique needs and preferences of each patient.

## VI. FUTURE ENHANCEMENT

Future work for the Artificial Intelligence-based Assistive Device for Alzheimer's patients could involve implementing health monitoring capabilities using Internet of Things (IoT) technology. This integration could enable real-time tracking of vital signs, activity levels, and medication adherence, providing valuable insights for caregivers and healthcare professionals. Additionally, enhancing the performance of CNN (Convolutional Neural Network) with facial recognition technology could allow it to identify unknown individuals and send alerts to family members via email, ensuring the safety and security of Alzheimer's patients.

## REFERENCES

1. G. Palacios-Navarro , J. Buele, ":Cognitive Decline Detection for Alzheimer's Disease Patients Through an Activity of Daily Living (ADL)", IEEE Transactions on Neural Systems and Rehabilitation Engineering, Vol. 30, 2022
2. Chima S. Eke , Emmanuel Jammeh, "Early Detection of Alzheimer's Disease with Blood Plasma Proteins Using Support Vector Machines", IEEE Journal of Biomedical and Health Informatics, vol. 25, January 2021.
3. Haibing guo and yongjin zhang, "Resting State fMRI and Improved Deep Learning Algorithm for Earlier Detection of Alzheimer's Disease", IEEE Access, Vol. 8, 2020.
4. Naimul mefraz khan, "Transfer Learning with Intelligent Training Data Selection for Prediction of Alzheimer's Disease", IEEE Access, Vol. 7, 2019.
5. Al-Shoukry, Suhad, Taha H. Rassem, and Nasrin M. Makbol. "Alzheimer's diseases detection by using deep learning algorithms: a mini-review." IEEE Access 8 (2020): 77131-77141.

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