

## Computer Vision & Clinical Natural Language Technology for Health Care

In the current era, Artificial Intelligence (AI) has become omnipresent, especially in the healthcare sector. The synergistic use of Computer Vision and Natural Language Technology (NLT) stands out as a transformative force. Computer Vision, empowers systems to derive insights from visual inputs, while NLT enables computers to interpret human language. Together, these technologies revolutionize healthcare, offering advanced capabilities for diagnostics and personalized care.

### OBJECTIVE

This report delves into the evolving trends of Computer Vision and NLT in healthcare, analyzing current patterns and forecasting future developments. The aim is to enhance diagnostic accuracy, streamline care plans, and advance predictive analytics in healthcare.

### SCOPE

The report explores the integration of Computer Vision and NLT in healthcare, specifically focusing on reducing errors and improving processes in diagnosis, prescription practices, and care plans.

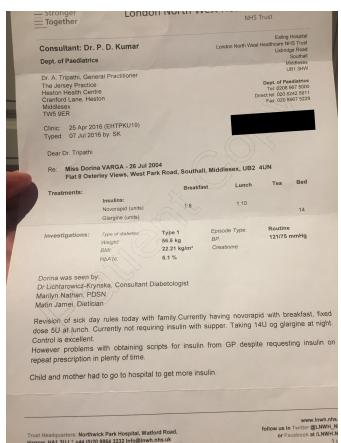
### ANALYZING TRENDS

#### Past Approaches:

Historically, clinical records relied on manual methods, posing challenges in accessibility and organization. Technological advances, particularly AI tools, have transformed patient care, aiding in diagnosis and improving efficiency.

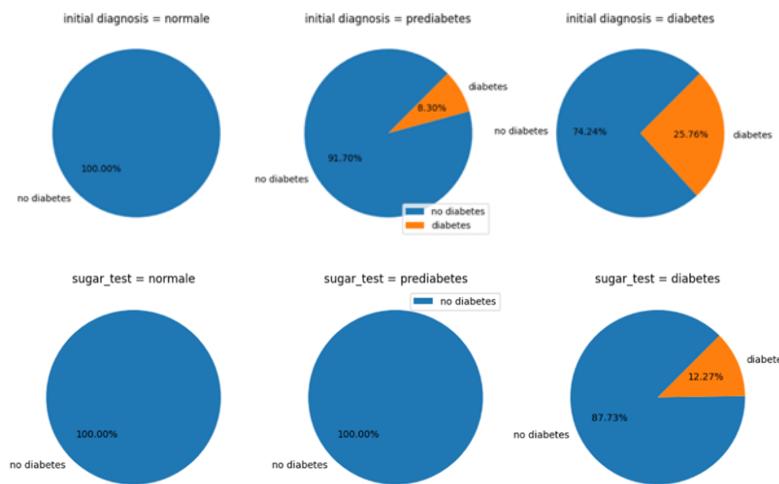
#### Present Approaches:

As technological advancements continue, Artificial Intelligence has become a pivotal element in the medical field. Leveraging AI tools such as computer vision, Natural Language Processing (NLP), and sophisticated data analytics methods significantly enhances patient care, aids in disease diagnosis, and improves overall efficiency.



Here we have taken printed prescription images of a diabetic patient and extracted the words using Azure Document Intelligence API and utilized Open AI API to derive personal recommendations.

For this analysis, a "diabetes prediction" dataset from Kaggle was utilized. Through machine learning models, we discovered that the average age for diabetes onset is around 42 years.



Individuals with an HbA1C level greater than 5.7% tend to have diabetes.

Another influential factor in diabetes is the blood glucose level. Individuals with a blood sugar level exceeding 126 are more likely to have diabetes.

A Logistic Regression model was trained to predict diabetes status with an initial accuracy of 95.72%.

False Positive Rate				
	precision	recall	f1-score	support
0	0.97	0.97	0.97	17501
1	0.71	0.70	0.71	1728
accuracy			0.95	19229
macro avg	0.84	0.84	0.84	19229
weighted avg	0.95	0.95	0.95	19229

Focusing on class 1 (diabetes), precision and recall were initially 0.87 and 0.61, respectively. The model was then optimized to balance precision (0.71) and recall (0.70) for diabetes cases, maintaining an

accuracy of 95%.

### **Future Approaches:**

AI tools, like Computer Vision and NLT, can accelerate drug development. Imagine a future where computer vision guides surgeons during operations and assists in accurate diagnoses, promising a more efficient healthcare system.

### **Opportunity**

- Implementing these technologies opens avenues for personalized and efficient patient care. Improved diagnostic accuracy enables informed decisions, and streamlining processes enhances operational efficiency.

### **Threats**

- Integration challenges with existing healthcare systems and initial setup costs could be barriers, requiring attention to standards and careful budget considerations.

### **Propose an idea:**

- Prioritize the development of explainable AI models, ensuring transparency. Develop real-time analytics tools for resource allocation and workflow optimization using Computer Vision and NLT.

## **CONCLUSION**

AI, especially Computer Vision and NLT, is reshaping healthcare. Embracing these technologies offers unprecedented opportunities but requires addressing integration challenges and costs. The proposed idea focuses on transparency and real-time analytics to optimize healthcare operations.

## **CITATION**

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3. *Diabetes prediction dataset.* (2023, April 8). Kaggle.  
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