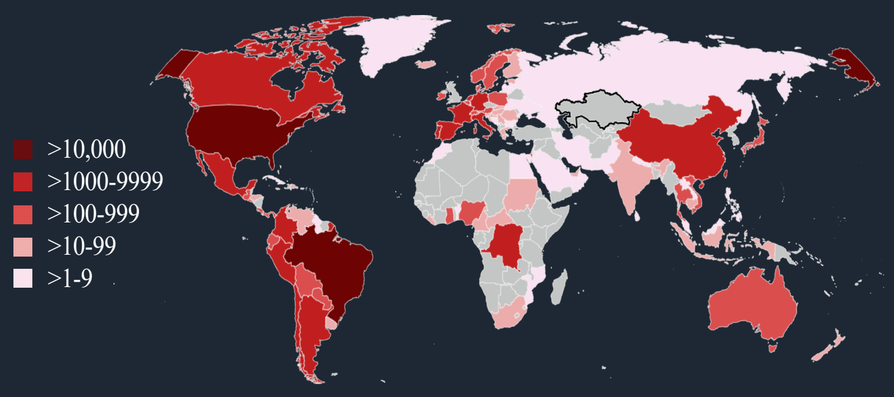
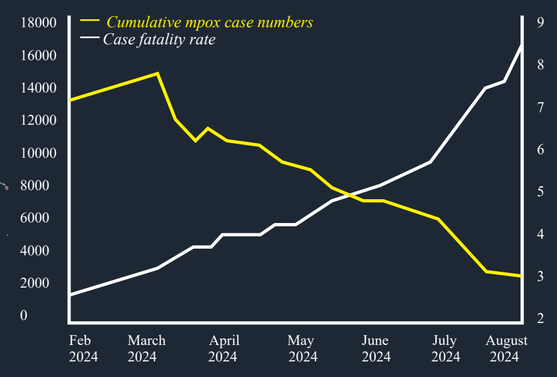
MONKEYPOX : A DUAL DIAGNOSIS APPROACH

Leveraging machine learning and viral genome sequencing

- Diagnose Mpox infections and assess disease severity
- Identify potential viral mutations
- Offers early detection, appropriate treatment
- Suggets lifestyle guidance, and mental health support

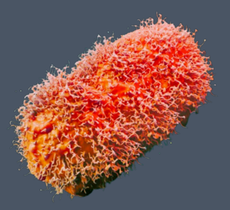
Since it's inception in 2022 and concurrently, this pandemic has mostly affected in Africa, especially in the Democratic Republic of Congo. In 2024, it began to spread in some Asian countries like Bangladesh and Singapore.





INTRODUCTION

Mpox is related to an enveloped double-stranded DNA virus categorized into the Orthopoxvirus genus of the Poxviridae family.



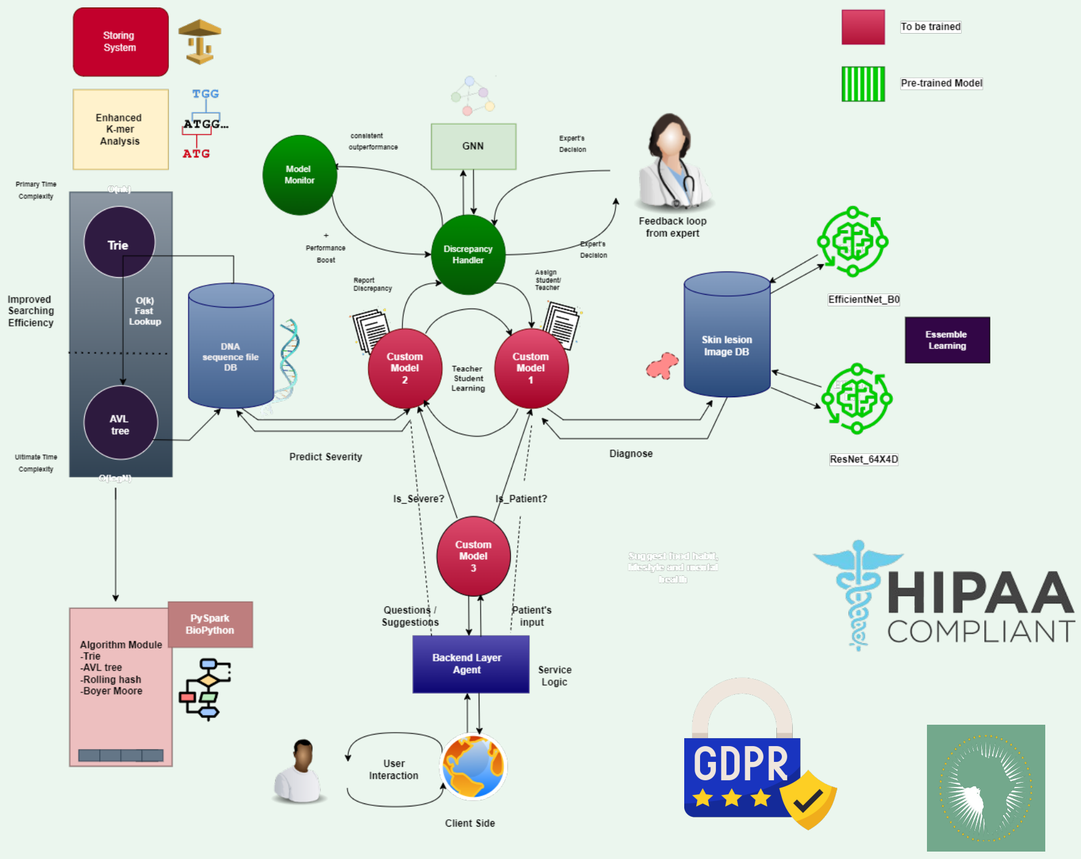
COMMON SYMPTOMS

Mpox causes signs and symptoms which usually begin within a week but can start 1–21 days after exposure. Symptoms typically last 2–4 weeks but may last longer in weakened immune system.

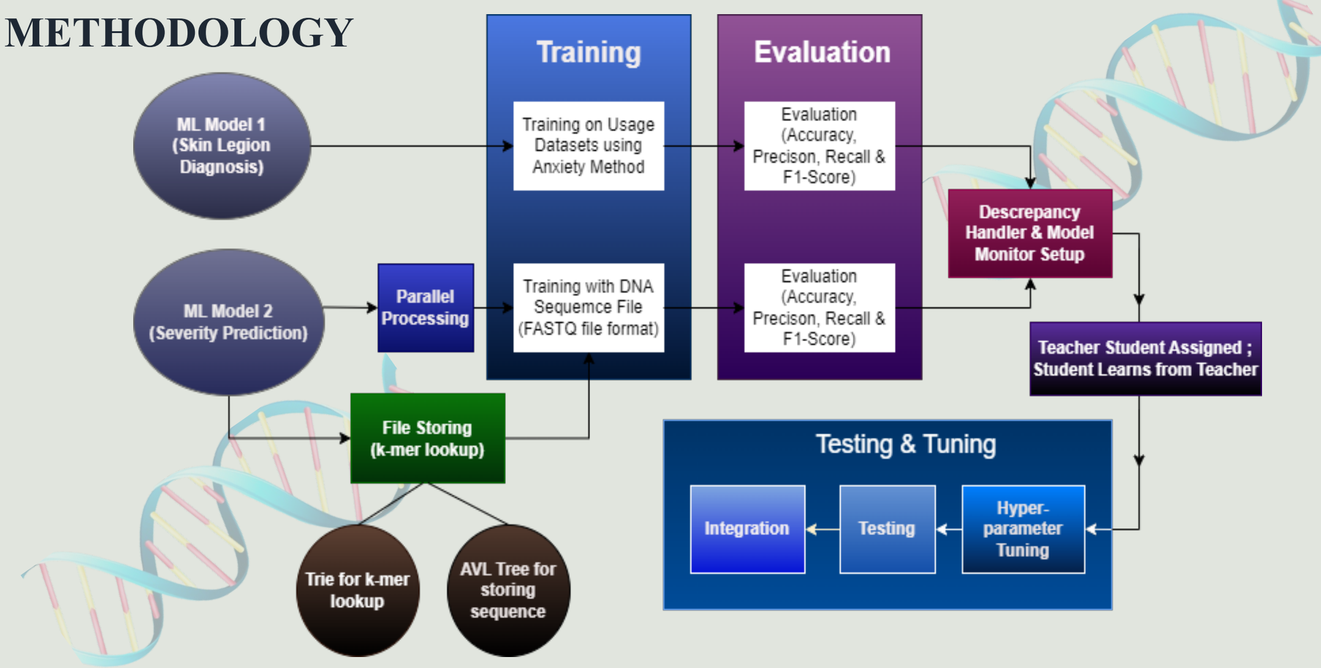
- Rash
- Fever
- Headache
- Muscle aches
- Backache
- Swollen lymph nodes
- Chills
- Exhaustion
- Respiratory symptoms

Other complications include pneumonia,corneal infection loss of vision, difficulty swallowing, vomiting and diarrhoea causing dehydration or malnutrition,infections of blood etc.

PROPOSED ARCHITECTURE



METHODOLOGY



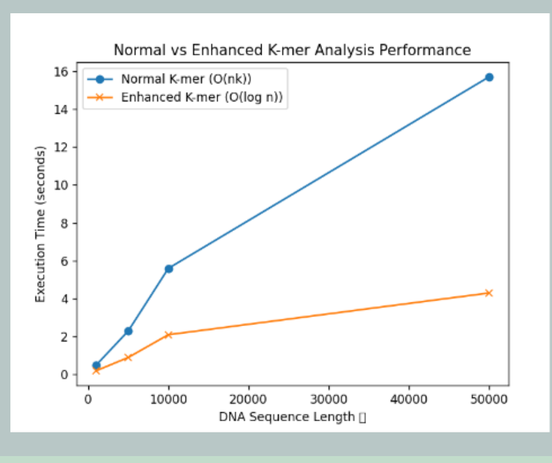
EXPECTED OUTCOME

Utilize ResNet, it precisely classifies skin lesions, enables early detection. Also employ GNN to analyze social networks and identify patients at risk of mental health.

Implement machine learning models to predict disease severity based on factors like viral mutations.

Stratify patients based on predicted severity for care.

It'll also give appropriate treatment plans based on individual data.



TECHNICAL FEASIBILITY

1 Functionality Focus
Building and refining critical components
On skin lesion image analysis, DNA sequence models etc.

2 Model Training
Combining custom-trained models with pre-trained ones
Integrate libraries like PySpark for parallel processing handling operations like AVL trees and NLP.

3 Iterative Development
Iteratively enhance the system
By feedback loops, advance learning, model refinements.

CONCLUSION & FUTURE SCOPES

This study presents an ML-based approach for Mpox that combines skin lesion image analysis and viral genome sequencing. Also offers improved diagnostic accuracy, detecting disease severity, personalized treatment recommendations, and enhanced patient outcomes. In future, as ML technology advances, we further expect-

Drug Discovery → Medicine Precision → Variant Characterization

With these advancements, we are confident that our approach will contribute to more effective, personalized healthcare solutions for Mpox and beyond, paving the way for future innovations in disease management.

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*To see the references, scan the QR code