CLINICAL DECISION MAKING AND PATTERN RECOGNITION IN HEALTH CARE

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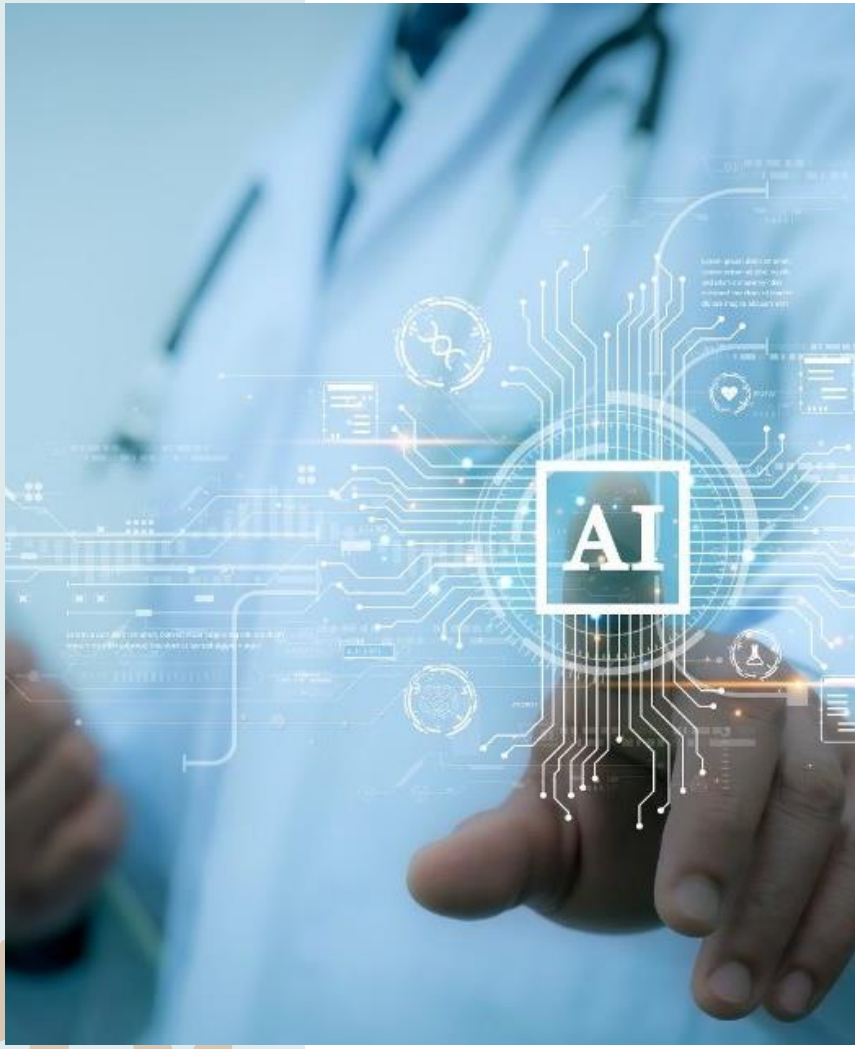
Introduction

- **Advanced Technologies in Healthcare:** Enhancing clinical decision-making and pattern recognition.
- **Computational Techniques:** Improve patient outcomes and streamline operations.

Key AI Technologies Impacting Healthcare

- **Chain Reasoning:** Systematic problem-solving, vital for clinical decisions.
- **Classification & Prediction:** Categorize medical data, predict patient outcomes, improve payment accuracy, and detect fraud.
- **Clustering & Inference:** Identify patient trends, optimize resource allocation, and enhance operational procedures.
- **Time-Series Anomaly Detection:** Monitor patient health metrics over time, identify anomalies indicating health declines or potential fraud.



Opportunities and Threats

Opportunities:

- Improved diagnostic accuracy.
- Optimized processes and personalized therapies.
- Reduced diagnostic errors and automated tasks.

Threats:

- Privacy and security concerns.
- Potential biases in AI.
- Risk of overreliance on AI compromising human judgment.

Strategic Recommendations for Cotivit

- **Partnerships:** Collaborate with AI developers to enhance decision support tools.
- **Predictive Analytics:** Improve payment accuracy, fraud detection, and consumer trend forecasting.
- **Proactive Solutions:** Offer efficient, profitable solutions to healthcare payers and retail clients.

Proof of Concept: AI Driven Fraud Detection

- Data Generation:
  - Synthetic data was created with variables like claim amount, provider ID, patient ID, gender, age, and service type.
- Model Training:
  - A Random Forest Classifier was trained to detect fraudulent claims.
- Model Evaluation:
  - The model achieved an accuracy of 79% on test data.
- Interactive Prediction:
  - Users can input claim details to receive predictions on fraud likelihood.

```
[ ] # interactive prediction
    def interactive_prediction():
        claim_amount = float(input("Enter claim amount: "))
        provider_id = int(input("Enter provider ID: "))
        patient_id = int(input("Enter patient ID: "))
        gender = int(input("Enter gender (Male 0 / Female 1): "))
        patient_age = int(input("Enter patient age: "))
        service_type = int(input("Enter service type (emergency 0, surgery 1, regular_checkup 2, vaccine 3): "))

        result = get_prediction(claim_amount, provider_id, patient_id, gender, patient_age, service_type)
        print(f"Prediction: {result['is_fraudulent']}")
        print(f"Fraud Probability: {result['fraud_probability']:.2f}")

    interactive_prediction()
```

```
Enter claim amount: 35000
Enter provider ID: 25
Enter patient ID: 22
Enter gender (Male 0 / Female 1): 1
Enter patient age: 36
Enter service type (emergency 0, surgery 1, regular_checkup 2, vaccine 3): 3
Prediction: 0
Fraud Probability: 0.24
```

THANK YOU

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