

AI-Driven Early Warning System for Hospital-Acquired Infections

The logo consists of a heart shape with a red-to-blue gradient. A white pulse line starts from the bottom left, enters the heart, and exits at the bottom right.

infeguard

Predict. Prevent. Protect.

by Cura Solve team

<https://github.com/omaralaa0/Infeguard>

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Our team

**dr.Eman A
Mahmoud**

infection control consultant &
heath information specialist

eng.Omar Alaa

Software Engineer

**eng.Mohamed
Hossam**

Software Engineer

team member rules

- team leadership
- conceptualizing the idea
- sourcing the dataset
- presentation preparing
- developing business model

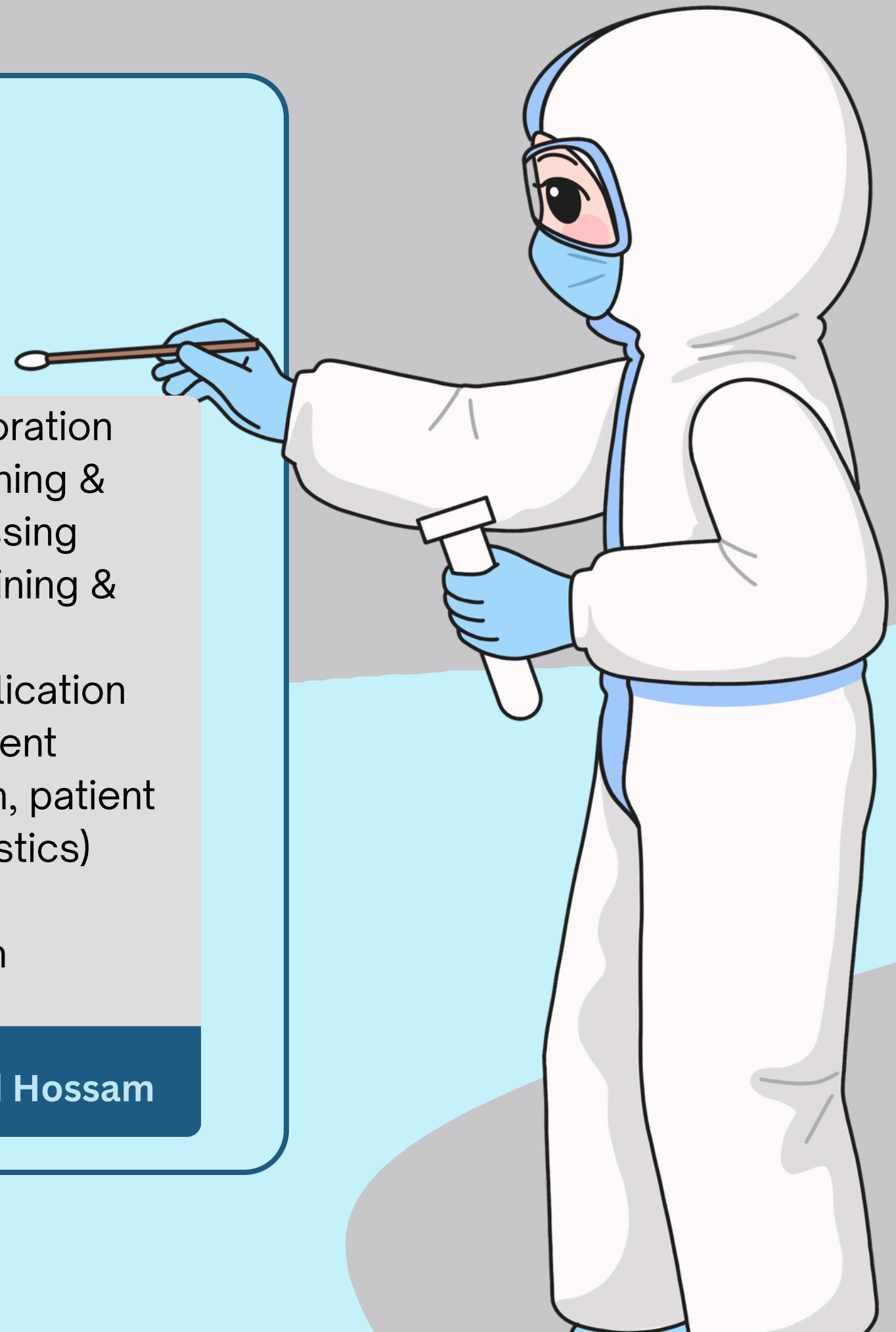
dr.Eman A Mahmoud

- Data Exploration
- Data Cleaning & Preprocessing
- Model Training & Testing
- Flask Application Development (prediction, patient data, statistics)
- Database Integration
-

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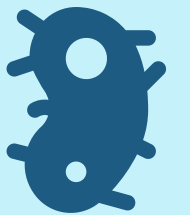


Project goal& objectives

AI-Driven Early Warning
System for Hospital-Acquired
Infections

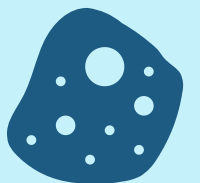
01

Within 12 months, Infeguard will be piloted in one hospital to reduce healthcare-associated infections by 30–40%



02

Decrease length of stay by 7–10 days per infected patient, and cut broad-spectrum antibiotic use by 20–25%



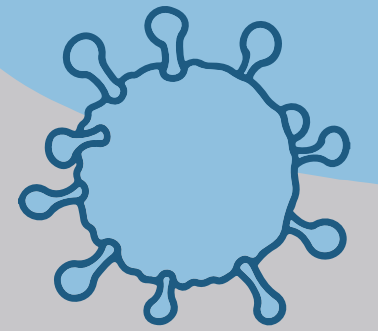
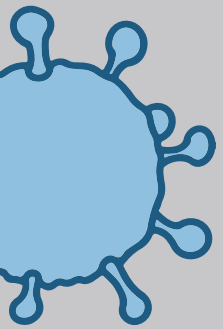
03

The system will then be scaled to 5 hospitals within 3 years



system architecture



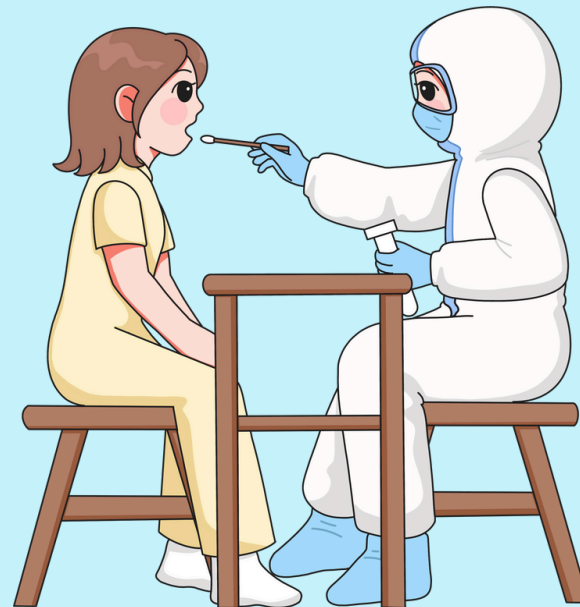


system architecture



User Interface (Frontend)

- HTML templates (form, patient data, results, statistics).
- Users input patient data and view predictions.



Application Layer (Backend - Flask)

- Routes handle input, prediction, and statistics.
- Calls machine learning model for infection prediction.
- Provides APIs for data retrieval & visualization.



Machine Learning Layer

- retrained ML model (lgbm_model.pkl) loaded in Flask.
- Model predicts HAI risk (e.g., "HAI" vs "No HAI").



Database Layer (SQLAlchemy)

- Stores patient data, predictions, and statistics.
- Enables queries for dashboards

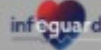


Deployment Layer

- Docker for containerization.
- Procfile for cloud deployment (e.g., Heroku).
- requirements.txt ensures environment consistency.

User Interface (Frontend)

Graphics-Final-Rev...Analyzing the advan...All Bookmar

HomePatientsStats

Update Patient

Patient Information

Full Name

Omar Negative

Phone Number

020000

Address

Giza

Clinical Data

Heart rate

100.0

Beats per minute

Mean arterial pressure

80.0

mm Hg

Chloride

108.0

mmol/L

Hematocrit

30.0

Percentage (%)

Platelet count

300.0

Count / mL

ICU length of stay

0.0

Hours since ICU admission

Pulse oximetry

100.0

Percentage (%)

Respiration rate

23.0

Breaths per minute

Creatinine

0.5

mg/dL

Hemoglobin

10.0

g/dL

Age

30

Years

Gender

Male

Temperature

37.0

Degrees Celsius

BUN

15.0

mg/dL

Serum glucose

150.0

mg/dL

Leukocyte count

17.0

Count / L

Hospital to ICU admission

5.0

Hours from hospital admission to ICU

Update

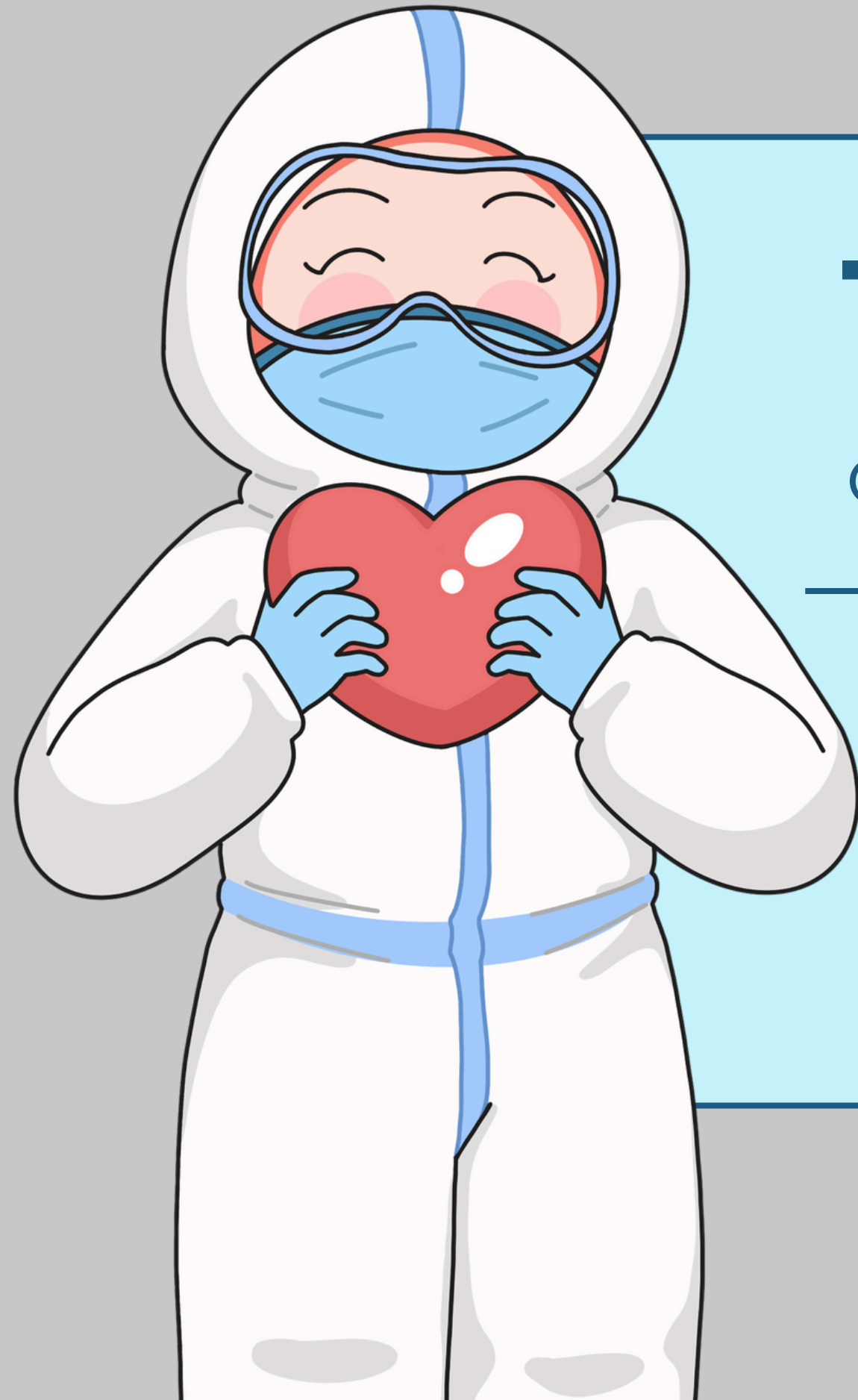
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Infeguard Business Model





THANK YOU!

Contact us if you have questions



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