

Proposal Presentation

by Md Mahadi Hasan

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Prediction of Early Gestational Diabetes using a ML Model

The slide features three hexagonal shapes: a large orange-outlined hexagon in the upper right, a medium dark blue solid hexagon in the center, and a small orange solid hexagon at the bottom center.

MD Mahadi Hasan



Content

- Research Background
- Literature Review
- Research Problem
- Research Aim and Objective
- Research Methodology
- Project Planning and Resources
- Project impact and limitations
- References



Research Background

In first decades,

Main reason for diabetes is high level of glucose.

Types of diabetes:

- Type 1
- Type 2
- Gestational diabetes

Gestational diabetes is a type of diabetes that happens during pregnancy.

Mainly effect mother and babies.

Machine Learning approaches now more popular for diabetes detection.

Literature Review



Paper [1] :



- Predict Gestational Diabetes and glucose levels using ML model.
- **Combined clinical, lifestyle, and previous medical background data** for accurate predictions.
- **Predict early detection Gestational Diabetes** that can improve mother and child health.

Paper [2] :

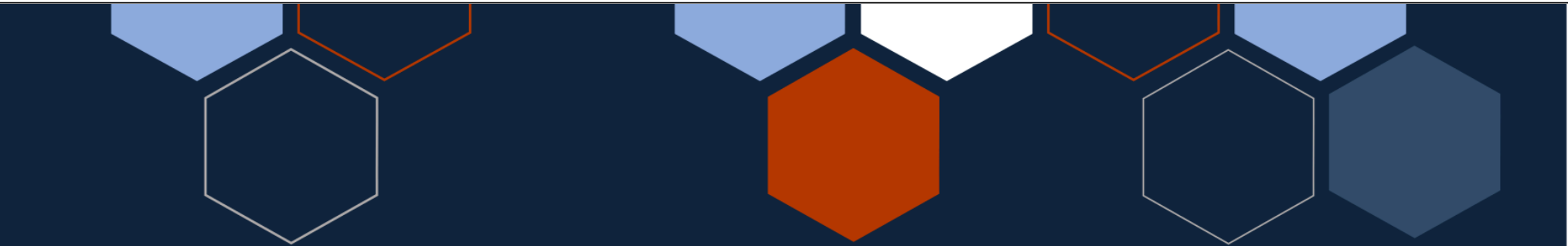


- Predict **GDM-related biomarkers and glucose levels** early in pregnancy.
- Apply **machine learning techniques** for accurate prediction.
- Help to detect Gestational Diabetes early and provide timely care for mother and baby.

Paper [3] :



- **Predict Gestational diabetes based on pregnancies, age, weight, blood pressure, insulin, glucose levels.**
- **Using publicly datasets for training and testing.**
- **Applied Popular Machine Learning Algorithms such as Random Forest, SVM and Hybrid SVM.**
- **Hybrid model performed the highest accuracy of 83%.**



Problem Statements

A decorative header at the top of the slide features a row of hexagons. From left to right, there is a light blue hexagon, a dark blue hexagon with an orange outline, a solid orange hexagon, a white hexagon, a dark blue hexagon with an orange outline, a light blue hexagon, and a dark blue hexagon. Below these are larger hexagons: a dark blue one with an orange outline, a solid orange one, a dark blue one with an orange outline, and a solid dark blue one.

Observation:

- Traditional diagnostic methods like oral tolerance tests are time consuming mainly detect the condition.
- Delayed diagnosis can complications for both mothers and baby.
- Predict gestational diabetes need accurate, reliable ML model using clinical and medical history data.

Research Aim and Objective

Aim:  improve the accuracy and efficiency of early Gestational Diabetes detection using ML. 

Objectives:

To predict early gestational diabetes for a machine learning-based system.

To use early prediction can enable timely interventions and improve mother and child health outcomes due to exactly early symptoms.

To evaluate the model using evaluation metrics.

To use fully wearable devices, lifestyle, or continuous monitoring data. 

Research Methodology

1. Collect early pregnancy dataset.
2. Clean and prepare the data.
3. Choose important risk factors.
4.  4. Train machine learning models.
5. Select best performing model.
6.  6. Finally Predict early Gestational Diabetes .

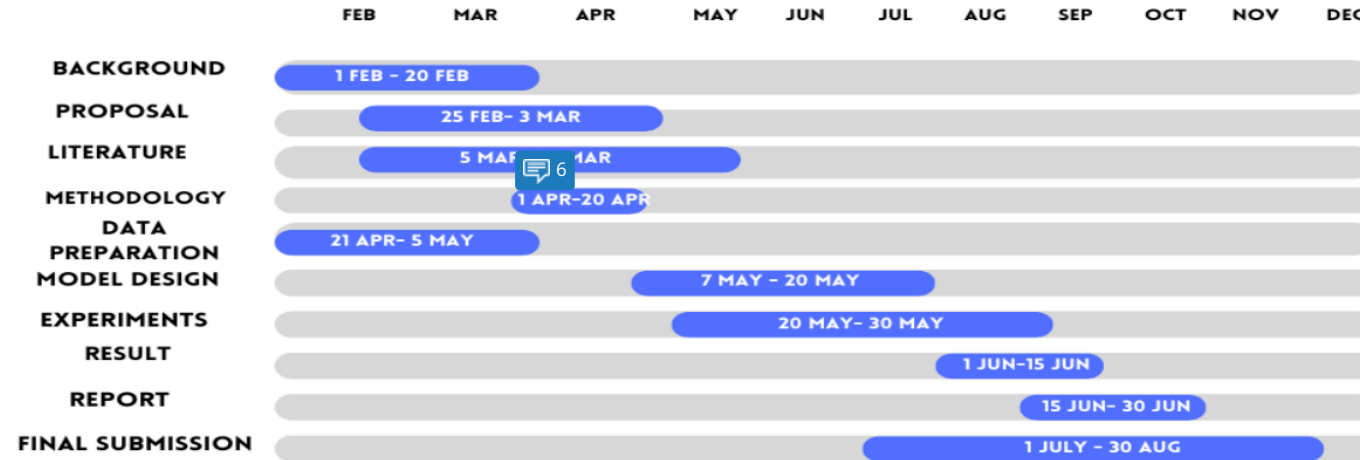




Project Planning and Resources



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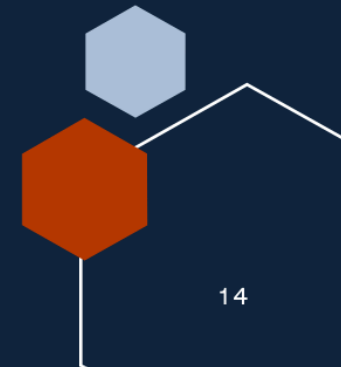


Resources :

Data : Need a perfect Datasets using publicly available datasets.

Software and Tools :

- Using Python Programming Language.
- Machine Learning Libraries like Scikit-learn, Tensorflow, PyTorch.
- Pandas, NumPy for Data Preprocessing.
- Matplotlib, Seaborn for Visualization.





Project impact and limitations

Impact :

1. Early detection of gestational diabetes provides timely support for mothers and reduces pregnancy risk.
2. Support healthcare professionals with decision making tools to improve early screening.

Limitations :

1.  Some ML model are difficult to interpret for healthcare professionals which affect trust and use.
2. Gestational Diabetes case are lower than non-cases as a result class imbalanced and reduced model accuracy.



References

- [1] A novel machine learning approach for diagnosing diabetes with a self-explainable interface.
- [2] Gestational Diabetes Prediction using ML Integrated with Web UI.
- [3] Prediction Analysis for Diabetic Disease Using Machine Learning Model.
- [4] Identification of Diabetes Level Using AI/ML Model.
- [5] A Novel Hybrid Model for Efficient Prediction of Diabetes Using Machine Learning.

A decorative graphic on the left side of the slide, consisting of a cluster of hexagons in various shades of blue, orange, and white, arranged in a honeycomb-like pattern. The hexagons are of different sizes and are some are solid colors while others are outlines.

Thank you

Proposal Presentation

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

53/100

Further to the comments provided during the presentation,
please follow the feedback provided for each category in the rubric.

Also, an artefact needs to be developed as part of the project.

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Comment 1

how ? This needs to be clear... it should be to develop an ML-based prediction model



Comment 2

is it detection or predicstion ?



Comment 3

is this part of your project ?



Comment 4

how do you select the machine learning models?



Comment 5

is it not part of the previous stage ?



Comment 6

is the literature review only upto Mar?



Comment 7

Limitations should be in line with the scope of the project.



Comment 8

Learn referencing

ENGAGEMENT WITH LIT.SKILL [20]

Relevant and recent Literature support for Research background/context [7 Marks] Recent Literature support for the identified research problem [7 Marks] Recent and Relevant in-text citations and reference list [6 Marks]

 A few literature is provided to support the background. However the referencing needs to be corrected as there is no details related to the publication year, journal et. so cant verify whether the literature is recent. Need to understand the citation and referencing using IEEE.

10**KNOWLEDGE _ UNDER.. SKILLS[15]**

Brief overview and current developments in the proposed research area [10 Marks] Research problem statement [5 Marks]

 Need to understand more about the ML based prediction. Why ML as there more DL based models as well. So review the literature properly to understand the recent developments in this area and then find the gap.

7**COGNITIVE&INTELL. SKILLS[20]**

Formulation of research aim and objective based on the identified research problem [20 Marks]

 Need to revisit the aim and objectives. Please be consistent with the term.. is it prediction or detection ... these are two different aspects. Also you need to develop an artefact as part of the

10

project. So formulate the aim and objectives accordingly.

PRACTICAL APPN SKILLS[25]

Selection of appropriate research methods and materials to achieve the research objectives, with justification [15 Marks]
Details of the data collection and evaluation process [10 Marks]

 Need to provide a proper research methodology and research design. Understand the research process and select the methods to achieve each objective. You need to provide the details of data, data collection and analysis.

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TRANSF. SKILL & PROF.PRAC [20]

Project planning and resource management [10 Marks] Description of the project's potential impact and limitations [5 Marks] Presentation style [5 Marks]

 The provided project planning is very basic. Understand each stage of the research project and redo the project planning. The presentation style was good.

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