Final Project Report:

You will write a report detailing every step you took to complete this project, it should

include the following content:

1. Project Title

Fetal Health Classification

2. Names**(Last name, First name)**

Bai Xiaoxue

Jiang Bei

Liu Yuchen

3. Introduction

This section should give an overview of the problem you are trying to address,

why it is relevant i.e. the motivation, the general approach on how you addressed

the problem, and the challenges you’ve faced.

4. Data

The dataset, sourced from Kaggle, comprising 2126 records from Cardiotocogram (CTG) exams forms the foundation of our project to classify fetal health into three categories: Normal, Suspect, and Pathological. Each record in this dataset encapsulates various features extracted from CTG exams, which have been meticulously classified by three expert obstetricians into the aforementioned categories. The inclusion of expert classifications provides a robust ground truth for training and validating our classification models.

The dataset is ideal for our project due to its comprehensive range of fetal health indicators, such as heart rate, uterine contractions, and movements. This allows for a detailed analysis of fetal well-being. Its direct relevance to reducing child and maternal mortality through early intervention aligns with our goal of improving prenatal care, particularly in resource-limited settings. Additionally, the dataset's size and variety offer a robust foundation for training diverse and effective machine learning models, enhancing the project's applicability and potential impact.

5. Methodology

This section should describe how you solve the problem e.g. each step you took

to address the problem. If you decide to take a machine learning approach,

please describe the class of function i.e. deep network architecture, provide the

objective function you use to train your model, and what algorithm you used to

optimize for your objective function.

6. Implementation Details

This section should give details about any data preprocessing, hyper-parameters

used. If a machine learning approach was taken, please provide learning rates,

momentum, batch size, weight decay, etc. used.

7. Results

This section should include evaluation criteria e.g. what is your measure of

success. This can be measured in error from the “ideal” outcome you expect.

Introduction and Background

Method

Implementation (Data Manipulation and Exploration, feature selection ,Dataset Balancing,Machine Learning Models)

Result (Data exploration, Dataset Balancing, Model performance metrics)

Discussion and conclusion