

Fetal Biometric Landmark Detection

(Task 1)

Project Title

Fetal Biometric Landmark Detection (Hourglass Model)

This repository contains all the files submitted for **Task 1**, including trained model weights, Python notebooks, assets, and the final report.

Folder Structure & Contents

1. Model Weights/

Contains the trained PyTorch model checkpoints corresponding to different hypotheses tested during experimentation.

File Name	Description
<code>hypothesis_1_full_saved_mode(best).pth</code>	Final saved model weights for Hypothesis 1 – Single-Hourglass architecture (final chosen model) . This model showed the best stability and performance.
<code>hypothesis_2_full_saved_mode.pth</code>	Model weights for Hypothesis 2 – Hybrid model (Heatmap + Coordinate Regression Head) . Used for comparative analysis.

2. Python Script/

Contains all the Jupyter notebooks used for model training, evaluation, and testing.

File Name	Description
<code>Trainer(bestModel).ipynb</code>	Notebook for training the final Single-Hourglass model (Hypothesis 1) . Includes data preprocessing, augmentation, and training loop implementation.

`hyp2TrainerAndTester.ipynb` Notebook for **training and testing the Hybrid Model (Hypothesis 2)**. Used to evaluate joint loss performance.

`Tester(bestModel).ipy nb` Notebook for **evaluating and visualizing results** of the trained best model on test data.

Subfolder: Assets/

Stores auxiliary files and dataset references used within the training notebooks.

File Name	Description
<code>KaggleTrainDatasetLink.txt</code>	Contains the Kaggle dataset link used for training .
<code>KaggleTestDatasetLink.txt</code>	Contains the Kaggle dataset link used for testing/validation .

3. Report/

File Name	Description
<code>Report.pdf</code>	Detailed technical report describing the problem statement, approach, experiments, model design, and results . Serves as the primary documentation for Task 1.

Summary of Submission

Category	Folder	Description
Model Files	<code>Model_Weights/</code>	Pre-trained models for all hypotheses
Code Files	<code>Python_Script/</code>	Jupyter notebooks for training and evaluation
Dataset References	<code>Python_Script/Assets/</code>	Links to datasets used for model training/testing
Documentation	<code>Report/</code>	Final research report summarizing methodology and results

Notes

- All `.ipynb` files are self-contained and can be executed sequentially for reproduction of results.
- Model files (`.pth`) correspond directly to the experiments described in the **Report.pdf**.
- Dataset links are provided in the **Assets/** folder for easy data access.