



“Photonic Crystal based Prediction of Cervical and Breast Cancer Using ML Model”

INTRODUCTION

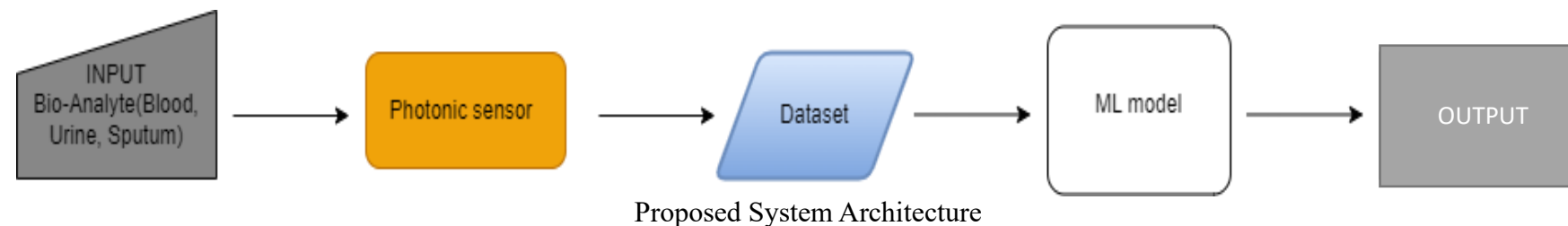
Cervical and breast cancer are major health concerns worldwide. Early detection and accurate prediction of these cancers are crucial for effective treatment. Photonic crystals offer a promising approach for analysing biological samples and predicting cancer using optical properties. This project aims to design an optimized photonic crystal structure and develop an ML model for accurate prediction of cervical and breast cancer.

OBJECTIVE

1. Design an optimized photonic crystal structure.
2. Generate design data using MEEP software.
3. Classify the generated data based on cancer types.
4. Develop an ML model for cancer prediction.
5. Create a user-friendly GUI for seamless interaction with the model.

METHODOLOGY

1. Design photonic crystal structure using appropriate lattice type and unit cell parameters.
2. Simulate the structure using MEEP software to generate optical data.
3. Extract relevant features from the generated data for cancer classification.
4. Train an ML model using classification algorithms to predict cancer types.
5. Develop a GUI to provide an intuitive interface for users to interact with the model.



TOOLS USED

1. MEEP Software – Ubuntu
2. Google Colab
3. Android Studio
4. PyCharm
5. Postman
6. MS Excel

RESULTS & INTEFERENCE

1. Optimized photonic crystal structure with desired optical properties was able to develop.
2. Classified the data generated indicating cancer types.
3. Trained ML model capable of accurate cancer prediction with models having accuracy 56% & 57% respectively.
4. User-friendly GUI for easy access and visualization of results.

FUTURE ENHANCEMENT

1. Incorporate more data sources.
2. Develop a more sophisticated user interface in the Android app.
3. Expand the approach to predict other types of cancer by utilizing photonic crystals.
4. Improve model by increasing its accuracy.

TEAM



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