Breast Tumor Classifier

Classifies Histopathological Images as Benign or Malignant

Subject Area

Intersection of Medical Imaging, Machine Learning, and Histopathology

- ○ Medical Imaging: Utilizing histopathological images
- ○ Machine Learning: Applying algorithms for classification
- ○ Histopathology: Analysis of tissue samples under a microscope

Problem Statement

- Develop a Machine Learning model to classify breast tumors
- Specifically focus on identifying non-cancerous tumors early
- Aim to assist prospective mothers
- Provide timely and accurate information about breast health
- Help make informed decisions about breastfeeding

Histopathological Image → **Machine Learning Model** → **Benign** / **Malignant**
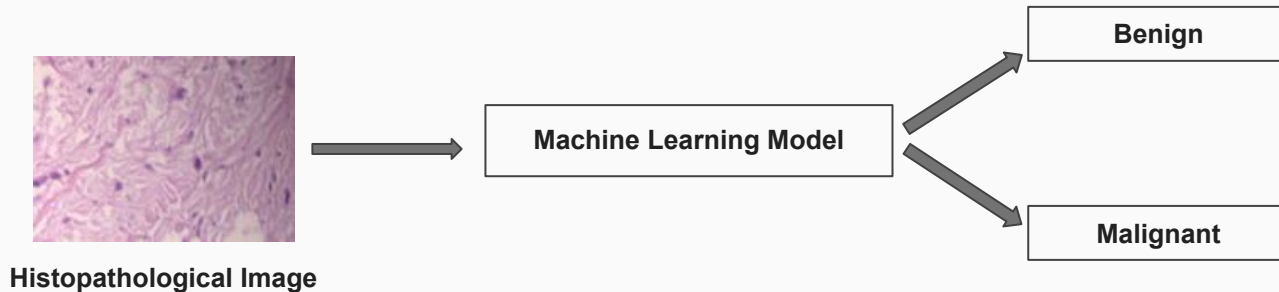
Project Vision

- Data Collection
- Data Preprocessing
- Model Training
- Model Evaluation
- Testing and Validation
- Model Deployment

Impact

- Early detection and intervention
- Informed decision-making for prospective mothers
- Reduced anxiety and stress
- Advancement in breast health research

Data Source

Breast Cancer Histopathological Database (BreakHis)

https://web.inf.ufpr.br/vri/databases/breast-cancer-histopathological-database-breakhis/

Exploratory Data Analysis

The BreaKHis 1.0 is structured as follows:

Magnification	benign	Malignant	Total
40X	652	1,370	1,995
100X	644	1,437	2,081
200X	623	1,390	2013
400X	588	1,232	1,820
Total of Images	2,480	5,429	7,909

Next steps…

- Data Preprocessing - Resizing, Padding
- Data Augmentation - Random brightness shifts, random rotations, random horizontal and vertical flips
- Modeling
    - Logistic Regression
    - Random Forest
    - XGBoost
    - CNN
- Model Evaluation
- Model Deployment