

AUTOMATED DETECTION OF TRAUMATIC INJURIES IN CT SCAN

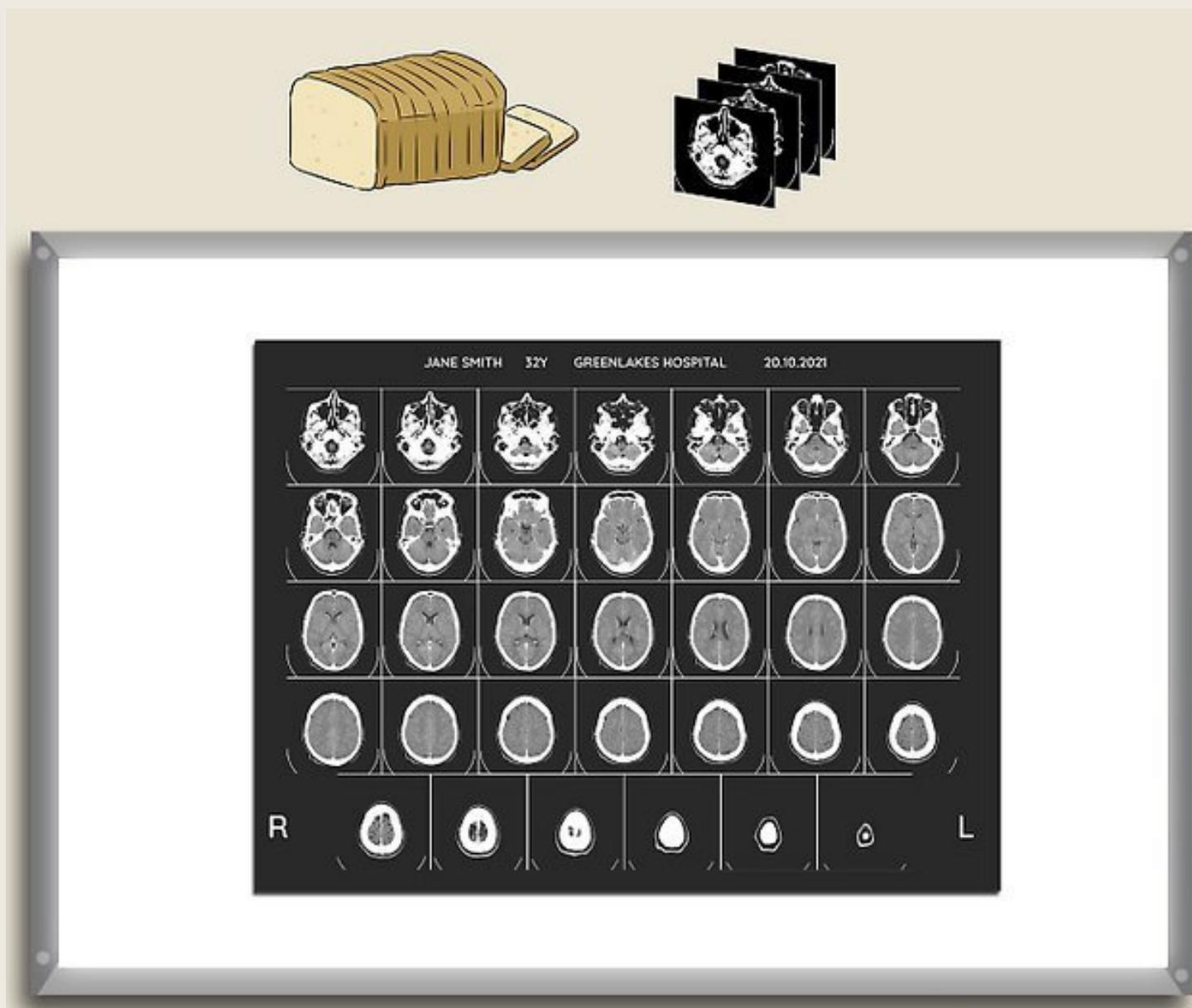
USING A PYTORCH-BASED
MACHINE LEARNING MODEL

BABAK DAVANI

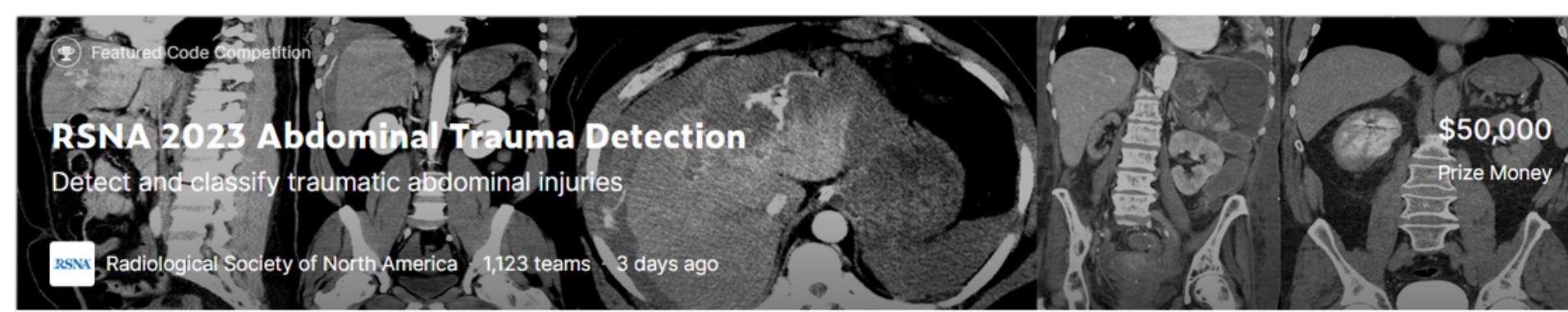
24.11.2023



INTRODUCTION TO ABDOMINAL TRAUMA



- **Definition of Abdominal Trauma**
- **Current Challenges in Diagnosis Using CT Scans**
- **Importance of Prompt and Accurate Diagnosis:**
 - **Cost**
 - **Time**
 - **Saving lives**



Overview Data Code Models Discussion Leaderboard Rules Team

Submissions

Late Submission

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Dataset Description

The goal of this competition is to identify several potential injuries in CT scans of trauma patients. Any of these injuries can be fatal on a short time frame if untreated so there is great value in rapid diagnosis.

This competition uses a hidden test. When your submitted notebook is scored, the actual test data (including a full length sample submission) will be made available to your notebook.

Files

[train.csv](#) Target labels for the train set. Note that patients labeled healthy may still have other medical issues, such as cancer or broken bones, that don't happen to be covered by the competition labels.

Files

1500869 files

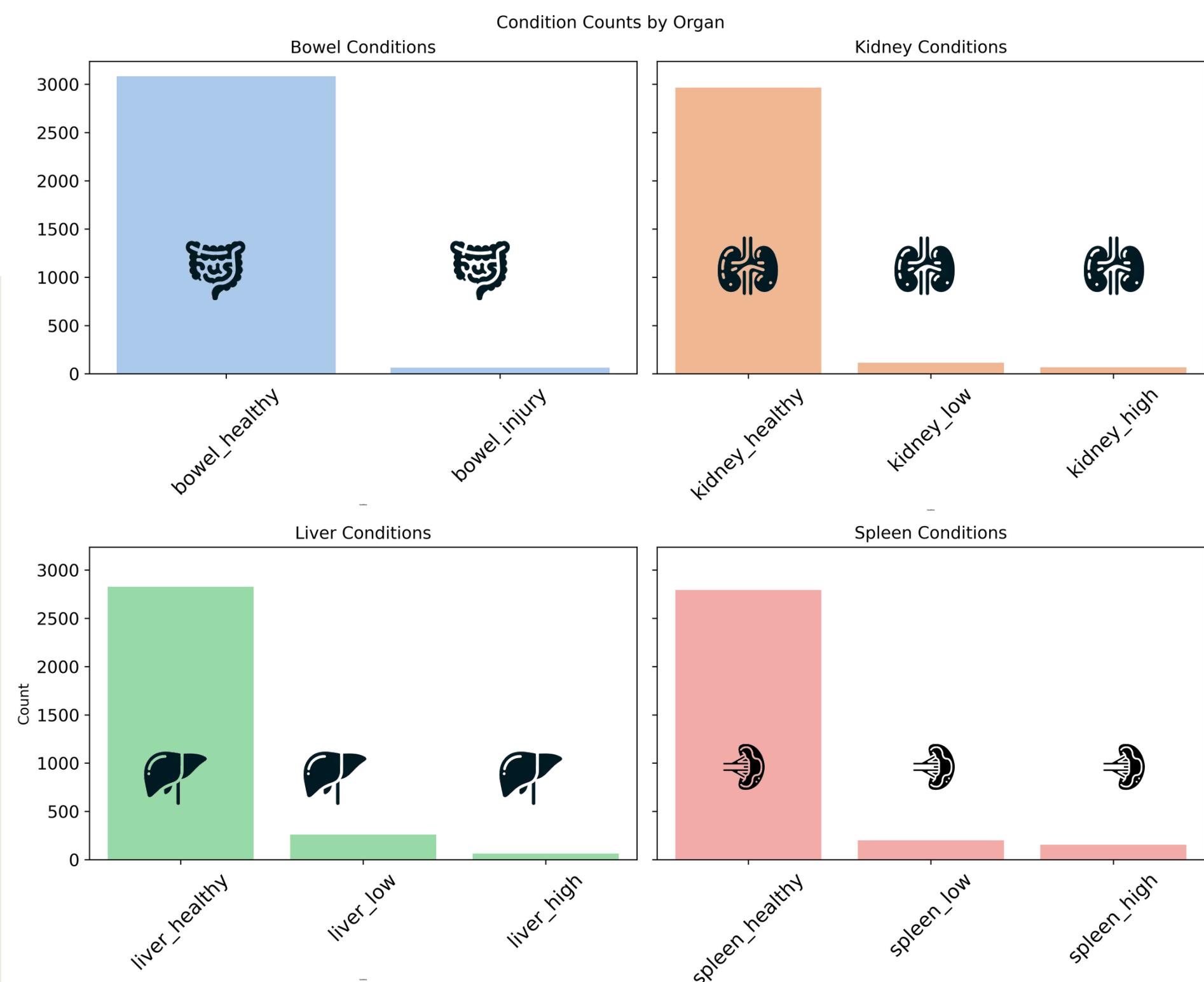
Size

460.34 GB

Type

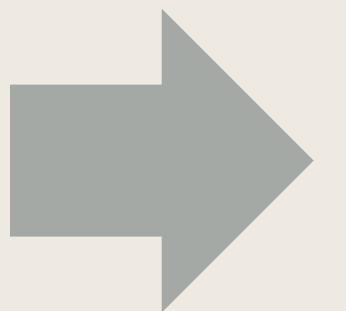
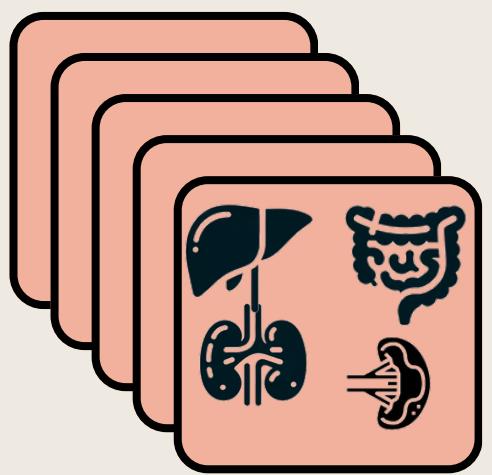
dcm, nii, csv

DATASET OVERVIEW



DATA PREPARATION

Dicom Images



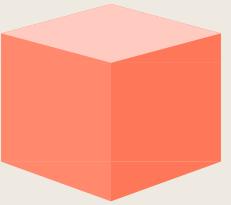
png Images



256 * 256



3D tensors



CHOOSING MODEL

Logistic Regression

Convolutional Neural Networks(CNN)

Transfer Learning

Representation Learning



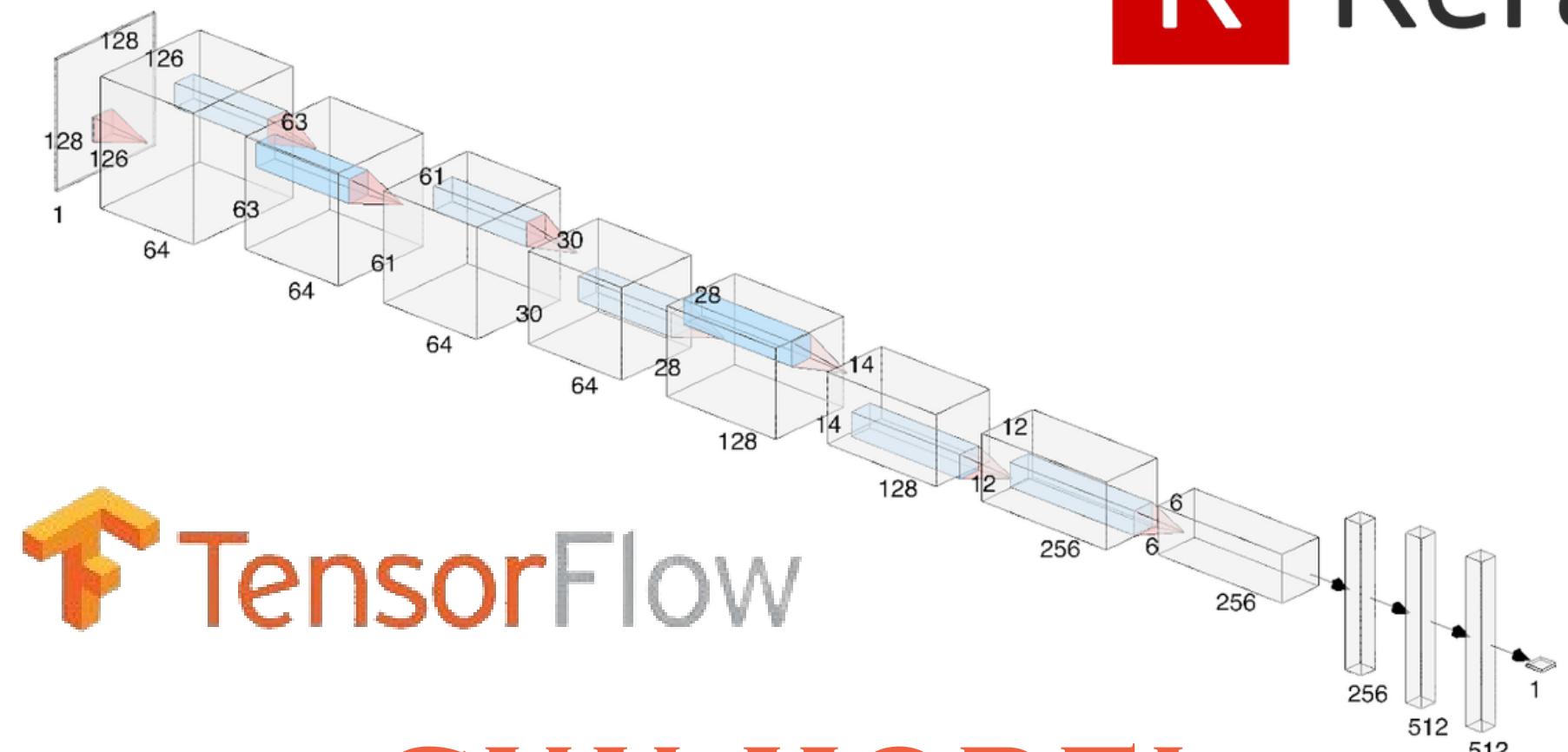
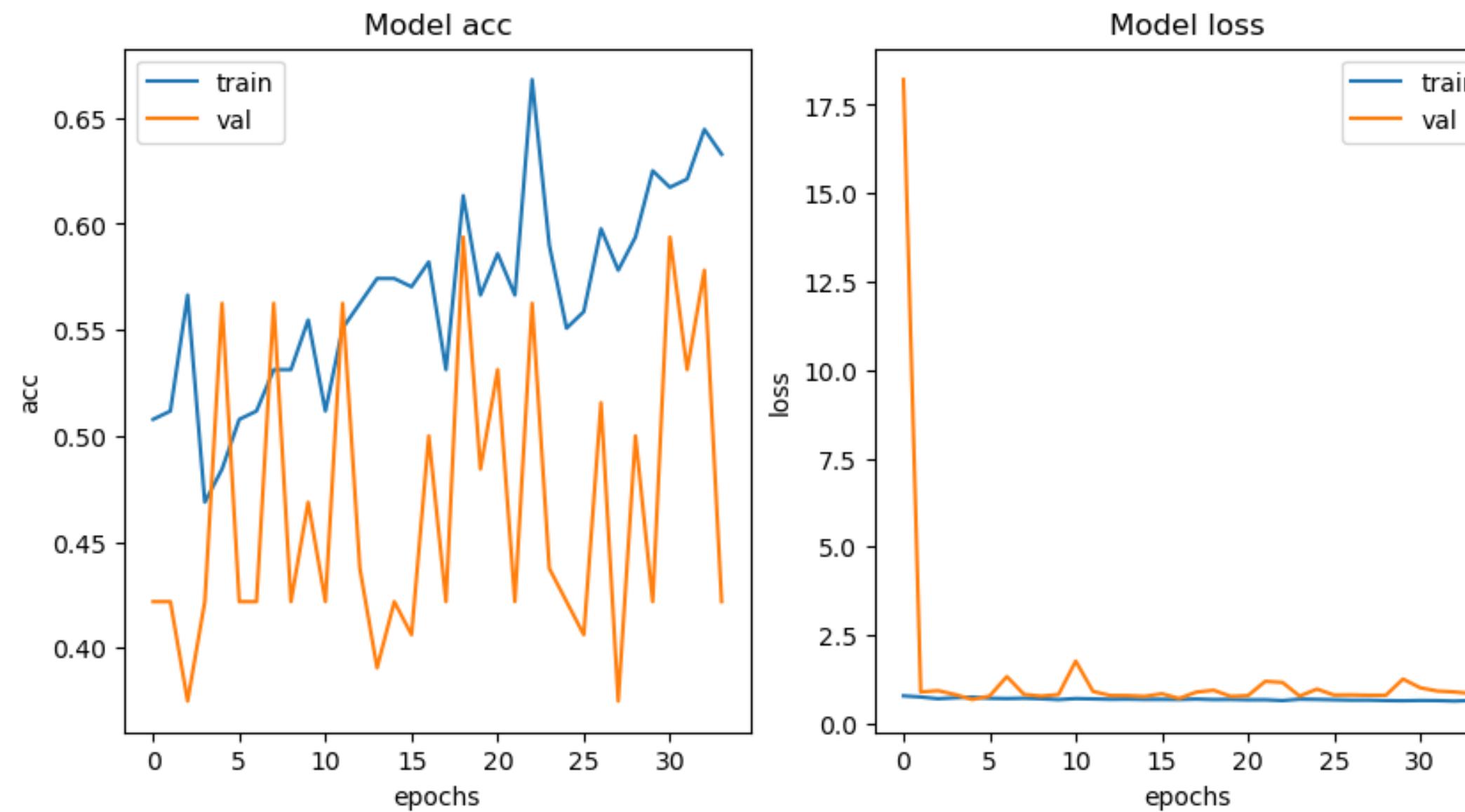
CHOOSING PACKAGE

PyTorch

Keras

TensorFlow

BASE MODEL



 TensorFlow

CNN MODEL



BEST MODEL

Optimizing Parameters

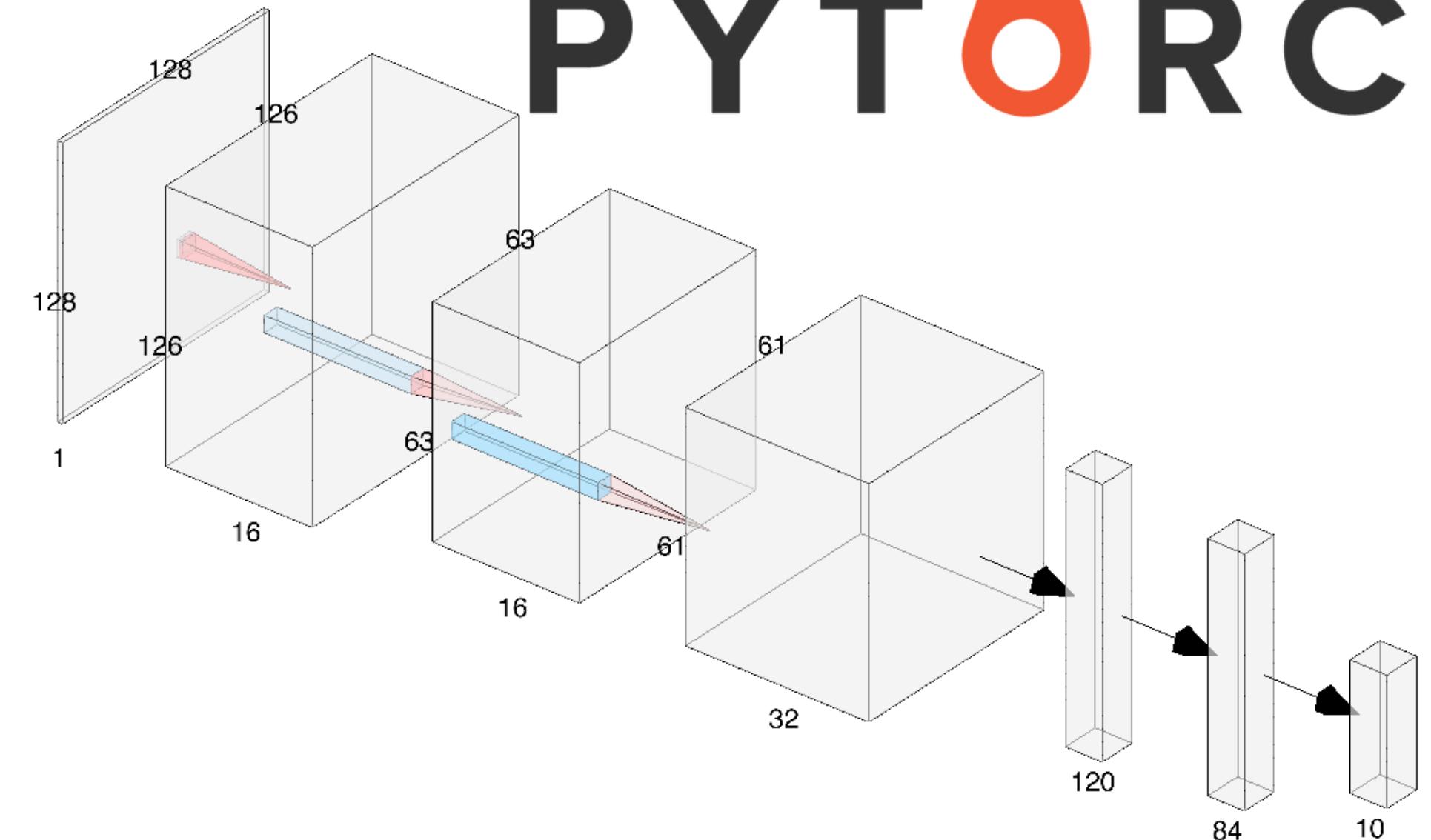
Database sampling batch size

Number of epoch

Learning rate

Loss function

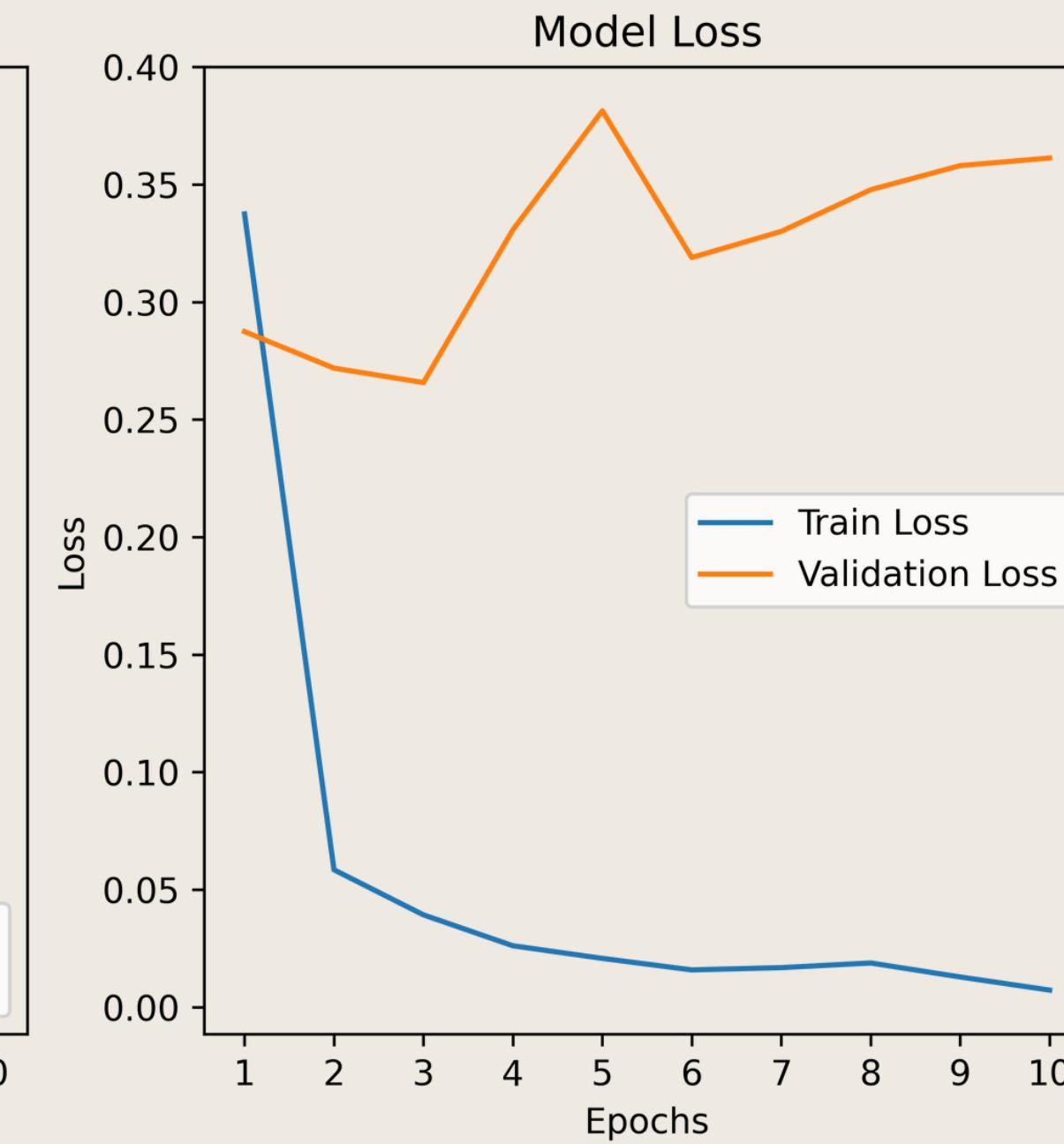
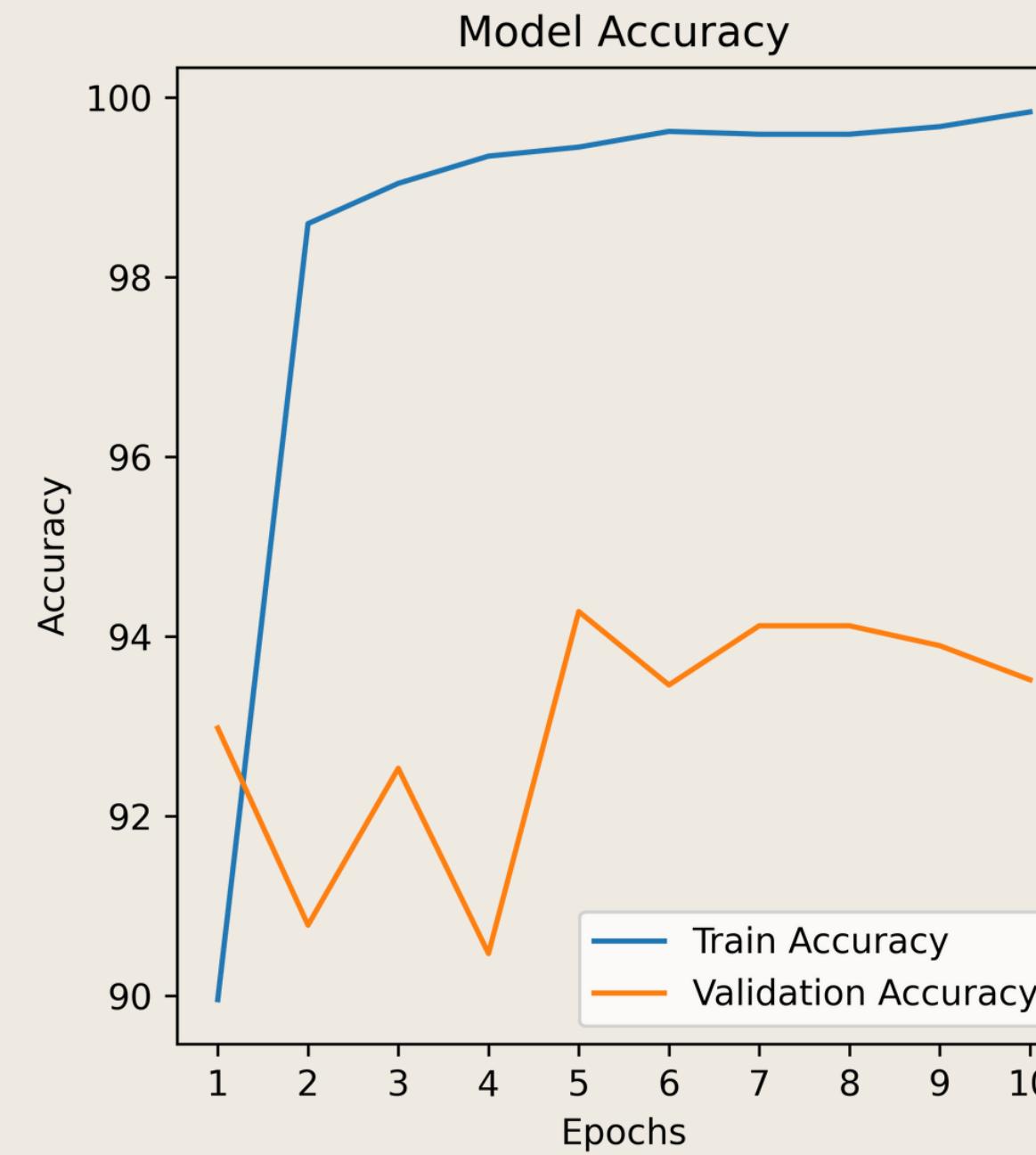
PYTORCH



CNN MODEL



RESULTS

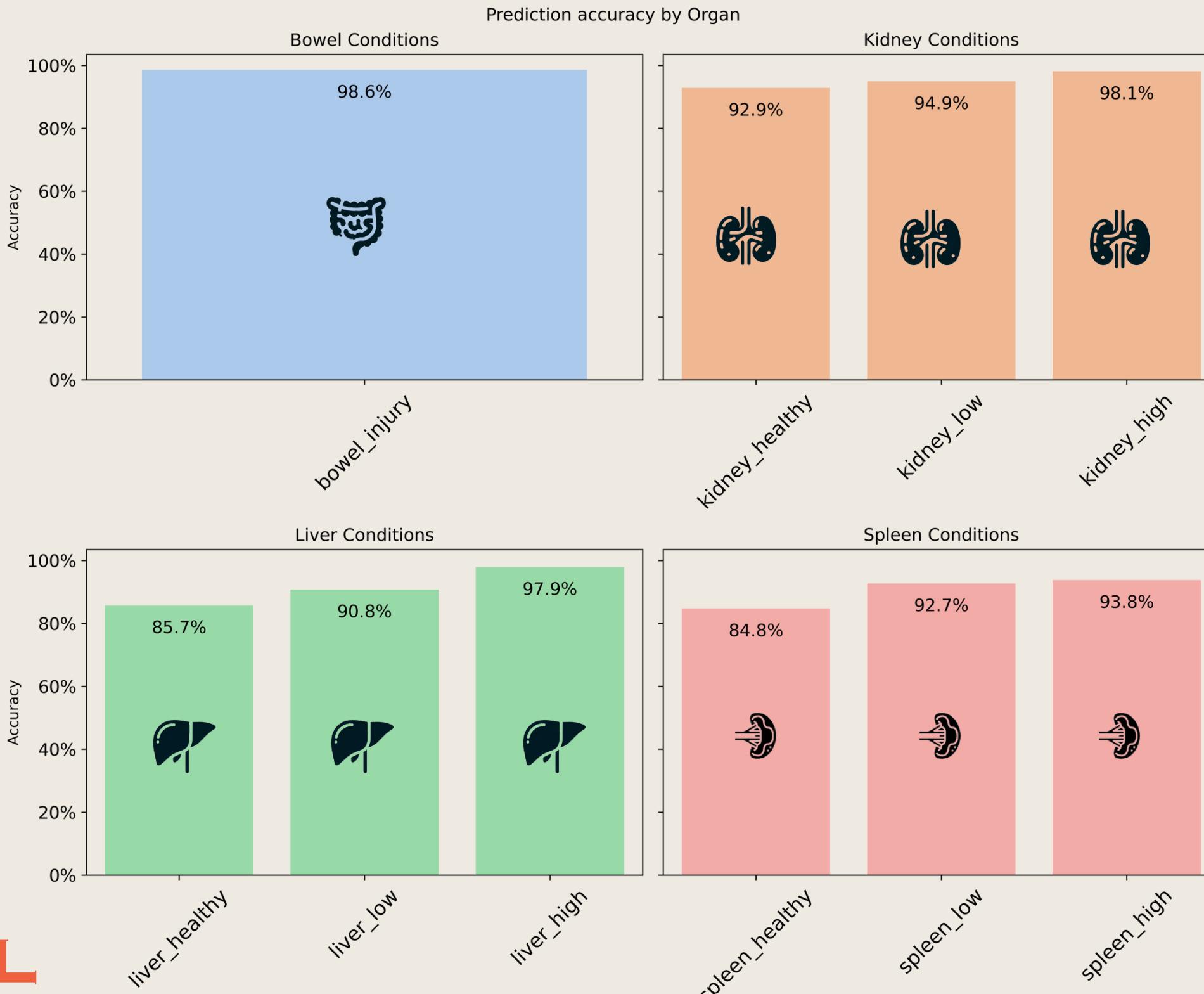


CNN MODEL

PYTORCH



RESULTS



CNN MODEL

PYTORCH



THANK YOU VERY MUCH

