Liver Segmentation with U-Net in PyTorch

Project Description:

In this project I worked with real medical images to segment the liver in grayscale CT scans. I built a custom U-Net architecture from scratch using PyTorch, including skip connections and ELU activations to improve the model's learning and stability.

The training process was done on Google Colab using images stored in my Drive. I prepared the full pipeline—loading the dataset, preprocessing the data, training the model, and testing the output. The goal was to teach the model how to identify the liver region accurately just from the scan.

Tools I used:

- PyTorch
- Google Colab
- PIL, torchvision
- TensorDataset, DataLoader
- matplotlib

What I did:

- Designed and implemented the full U-Net model by myself
- Loaded and processed the dataset of CT images and masks
- Trained the model and visualized predictions
- Connected everything with Google Drive to run and test the project easily

---

Visual Result:

- Top: original CT scan (abdomen)
- Bottom: liver mask predicted by the model

(Here's where you can place your image in Word)

Main Skills:

PyTorch, Convolutional Neural Networks (CNN), Medical Image Segmentation, Deep Learning, Data Pipelines, Google Colab, Python

---

Short summary (for portfolio or proposals):

Liver segmentation project using a custom U-Net model built in PyTorch. I trained it on real grayscale CT scans and created the whole pipeline from dataset loading to predictions. A hands-on project that taught me a lot about deep learning and medical imaging.