Deep Learning For Medical Imaging

UTD-CISI

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Abstract

To help ,medical professionals and researchers, the UTD Center of Imaging and Surgical Innovation has been trying to commercialize methods and tools that can assist in segmentation of the uterus and placenta in a pregnant woman. The project contains multiple different user interfaces that simplify the usage of the Deep Learning Model.

The objective of this project is to implement a Deep Learning model for segmentation and create a Graphics User Interface, a web application, and an FLYWHEEL user interface to better the usage of the model.

Keywords: Deep Learning, Segmentation, Neural Networks

Architecture

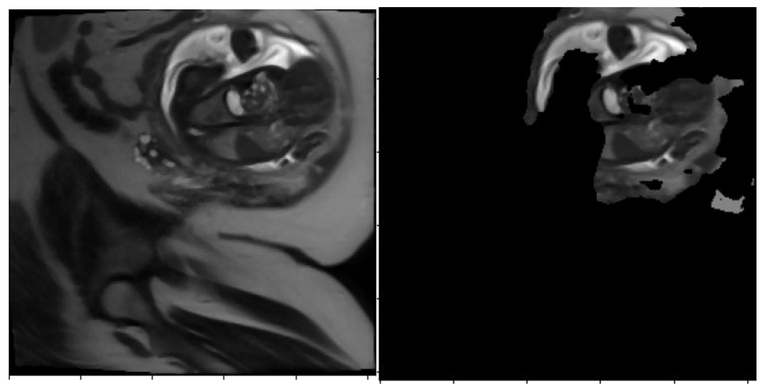
Deep Learning Model
- Python
- TensorFlow
- Keras

FLywheel UI
- Python
- JSOM
- DOCKER

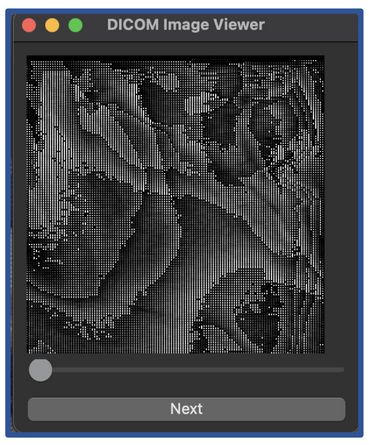
Web Application
- Nextj.js

Graphics User Interface
- Python
- PyQt5

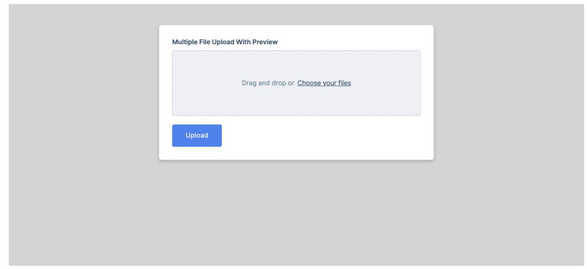
Results



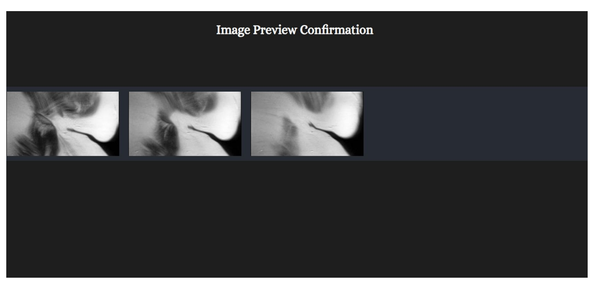
Model before and after masking



Dicom viewing in GUI



Web application input page



Web application output page

Impact

The UTD Center of Imaging and surgical innovation strives to reform medical assistance and aid by commercializing deep learning techniques to segment. Our work has moved the center greatly towards this goal

Performance Metrics

Weekly Task Completion Rate : 85 %
- There were some features that were not implemented
- Sponsor Feedback :
- Decent number of functional expectations were met but some functional requirements were not all fully met

Summary

- Allowed easier access to deep learning techniques
- Commercialized models by implementing such models with user interfaces.
- Built GUI, FLYWHEEL UI, and Web application to allow users to use the deep learning model for segmentation