

AI Based Segmentation

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Segmentación basada en IA en 3D Slicer

Manual vs AI-powered Segmentation

Clic en Agregar datos en el módulo Bienvenido a Slicer

Slicer carga el conjunto de datos de resonancia magnética de próstata

In the past decade, image segmentation has been powered by the development of deep learning algorithms (e.g. nnUnet by the German Cancer Research Center (DKFZ)/Helmholtz Research). AI-powered segmentation tools can reduce the segmentation time and provide more reproducible results.

AI Terminology

A is an AI algorithm that was trained to perform a specific task (e.g. brain tumor segmentation model).

The Weights of an AI model are small numbers that determine how much importance the model gives to different image features.

During the Training phase, a Model learns patterns from data labelled by experts and adjusts its weights to improve its predictions.

During the Validation/Test phase, the model is evaluated on a separate set of data not used during the Training phase.

During Inference, the model is applied to new datasets to perform the specific task it was trained for.

3D Slicer AI Workshop

This tutorial focuses on running inference tasks using various pretrained AI models for automated segmentation of anatomical and pathological structures.

MONAIAuto3DSeg Slicer extension

This tutorial uses the pre-trained models of the MONAIAuto3DSeg Slicer extension.

The tool is designed to work on laptops or on average desktop computer without a GPU.

MONAIAuto3DSeg Slicer extension

Clic en Crear nueva segmentación en

Aplicar

Slicer AI Tutorial: Segmentation Tasks

Segmentation Task #1: Prostate.

Segmentation Task #2: Brain Glioma.

Segmentation Task #3: Whole Body Segmentation.

**Slicer muestra el
resultado de la
segmentación prostática
basada en AI**

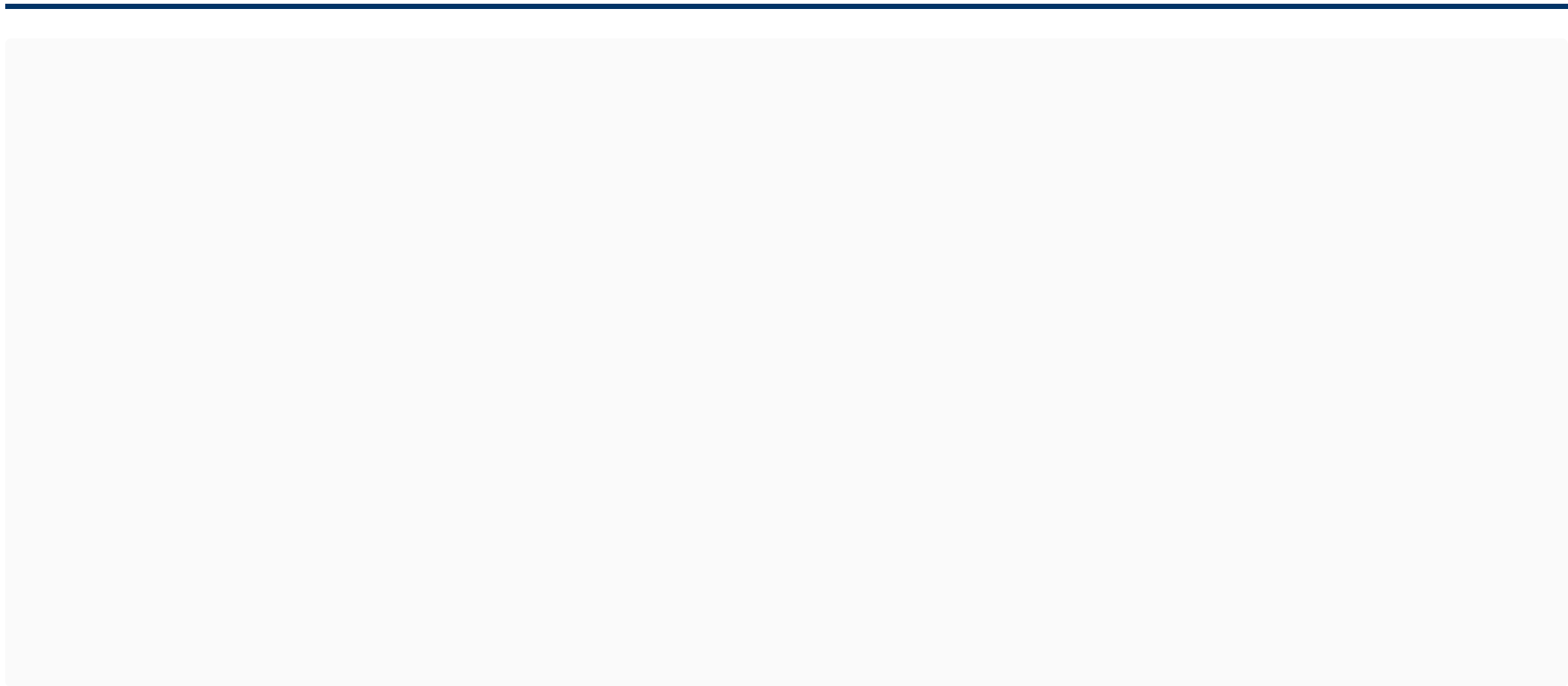
Cargar dataset4_BrainMRI_Glioma

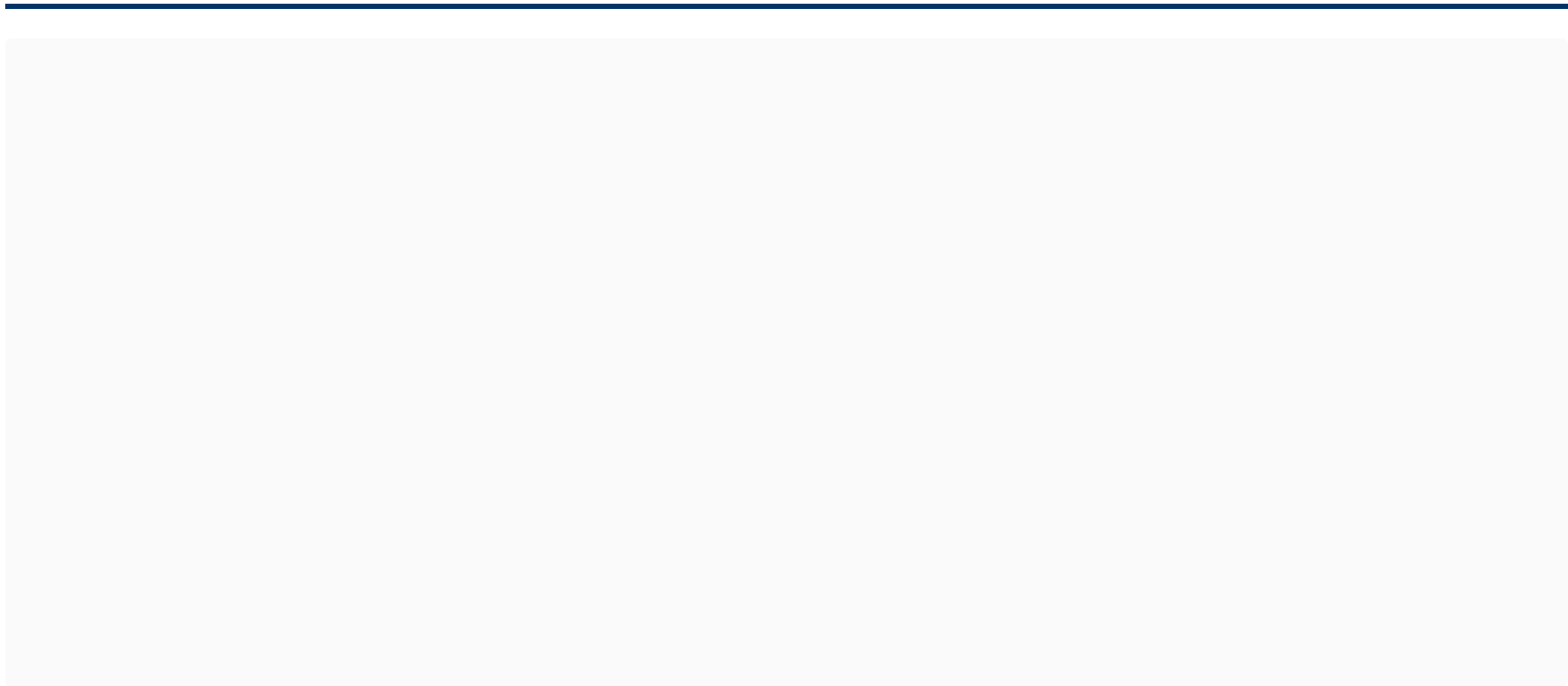
AI-based Segmentation of Peripheral Zone (PZ) and Transition Zone (TZ) of the prostate on T2-weighted MRI Images.

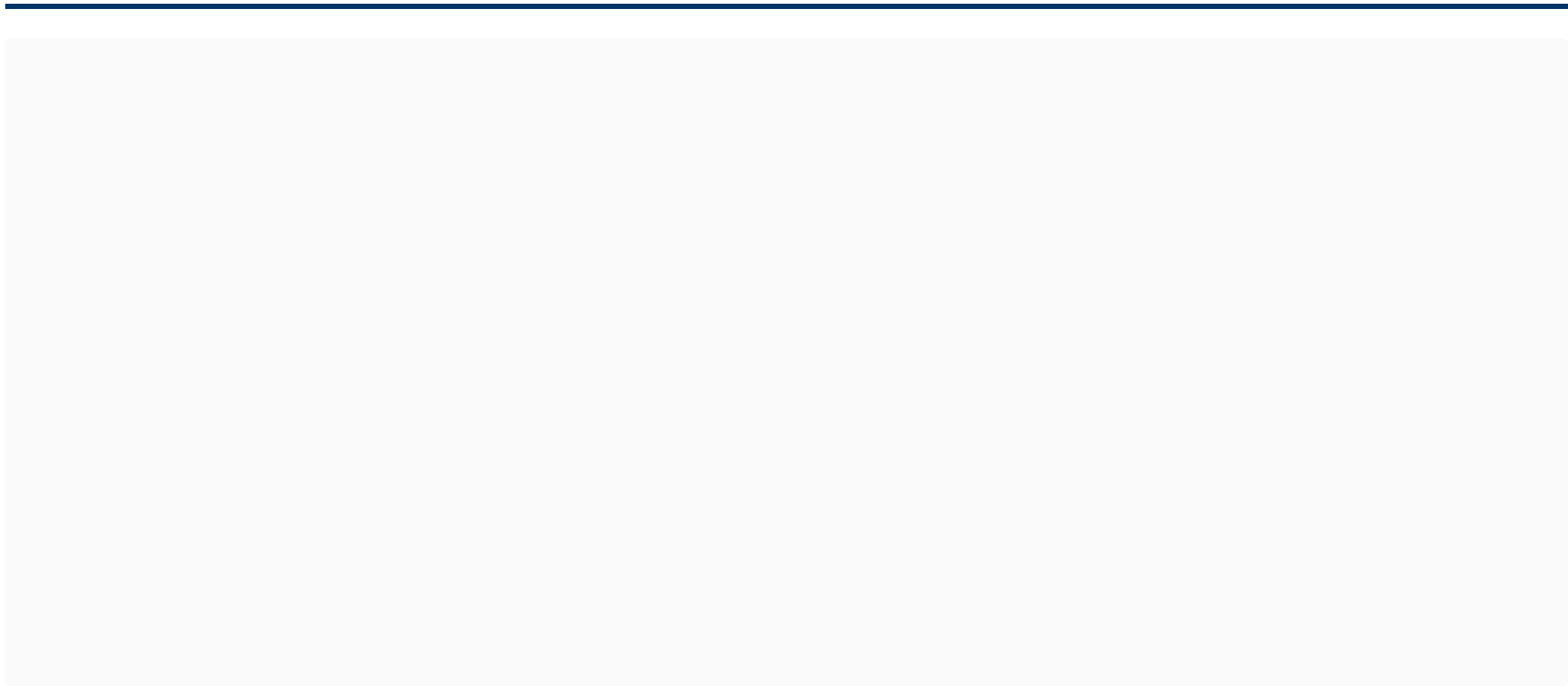
Dataset:

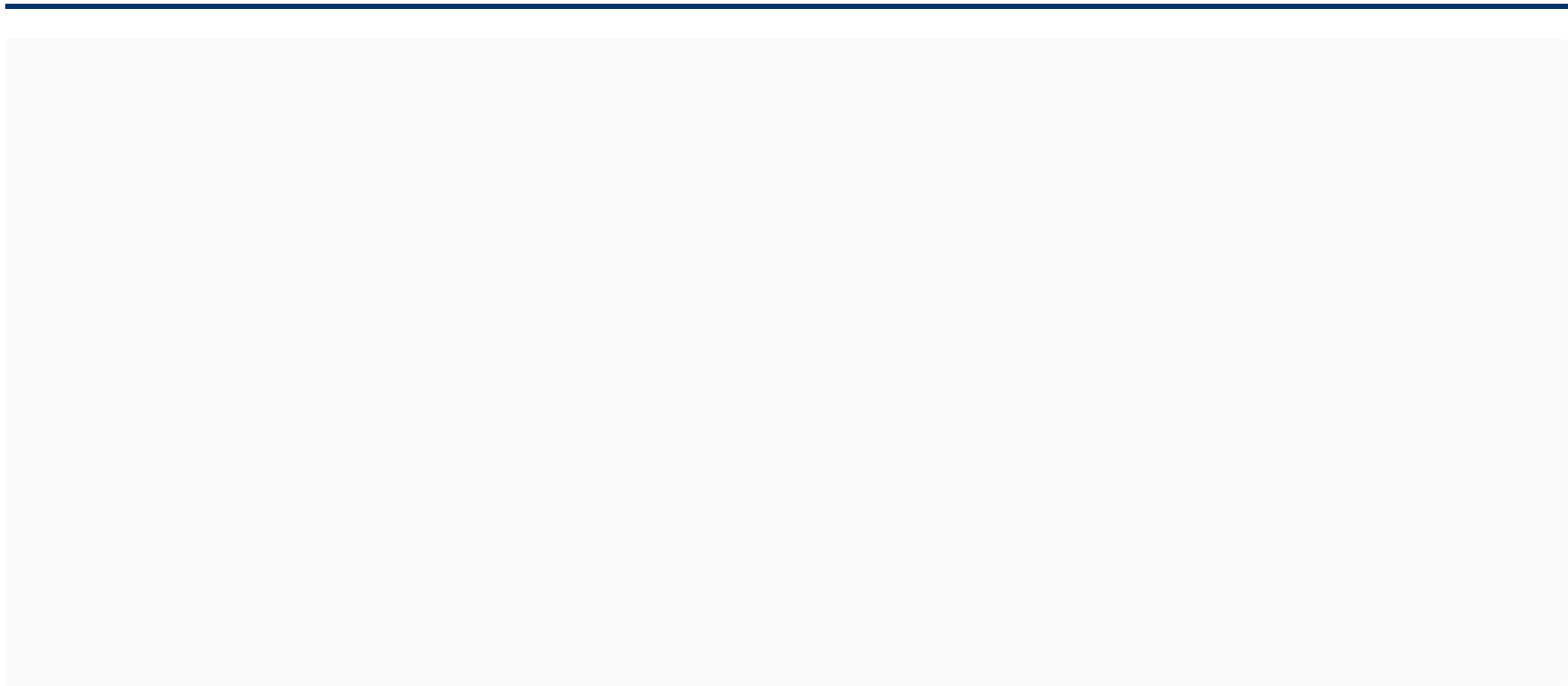
msd_prostate_01-t2

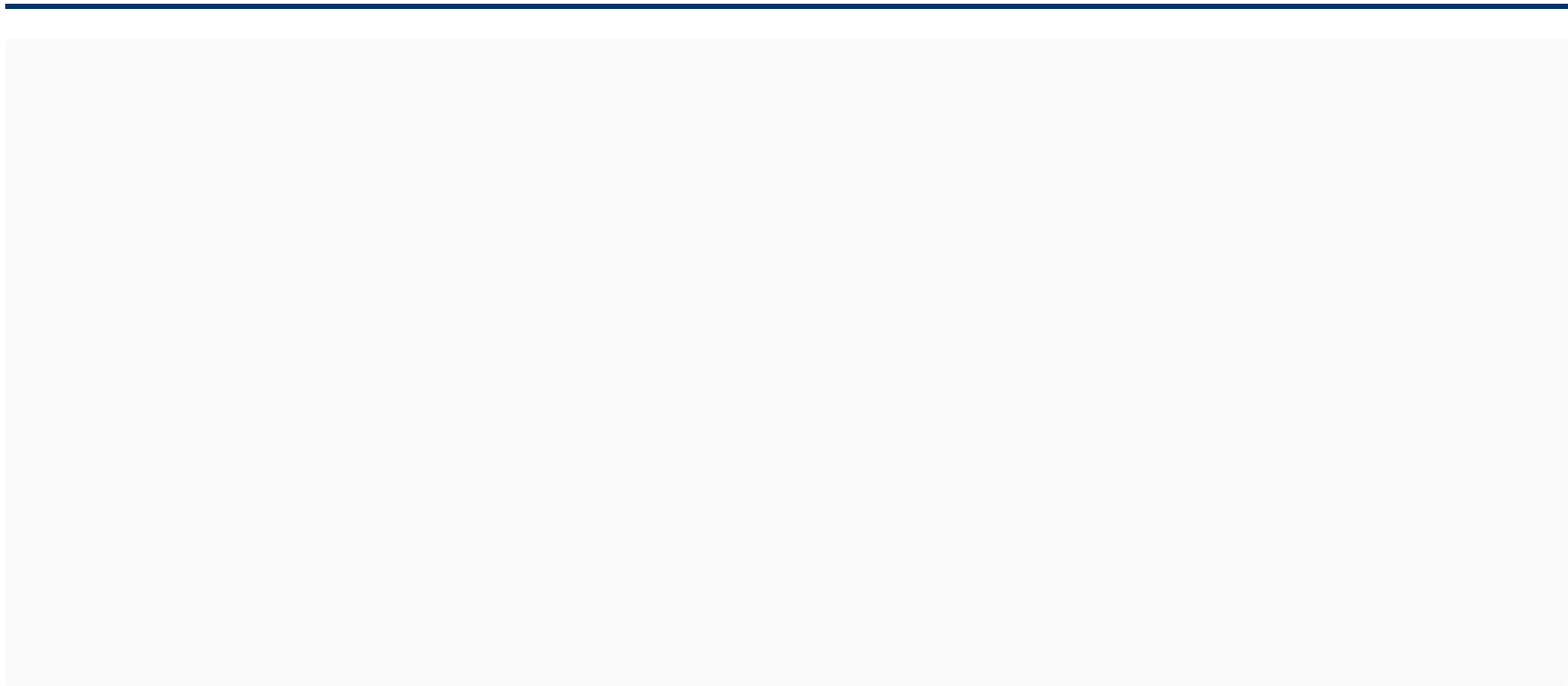
msd_prostate_01-adc

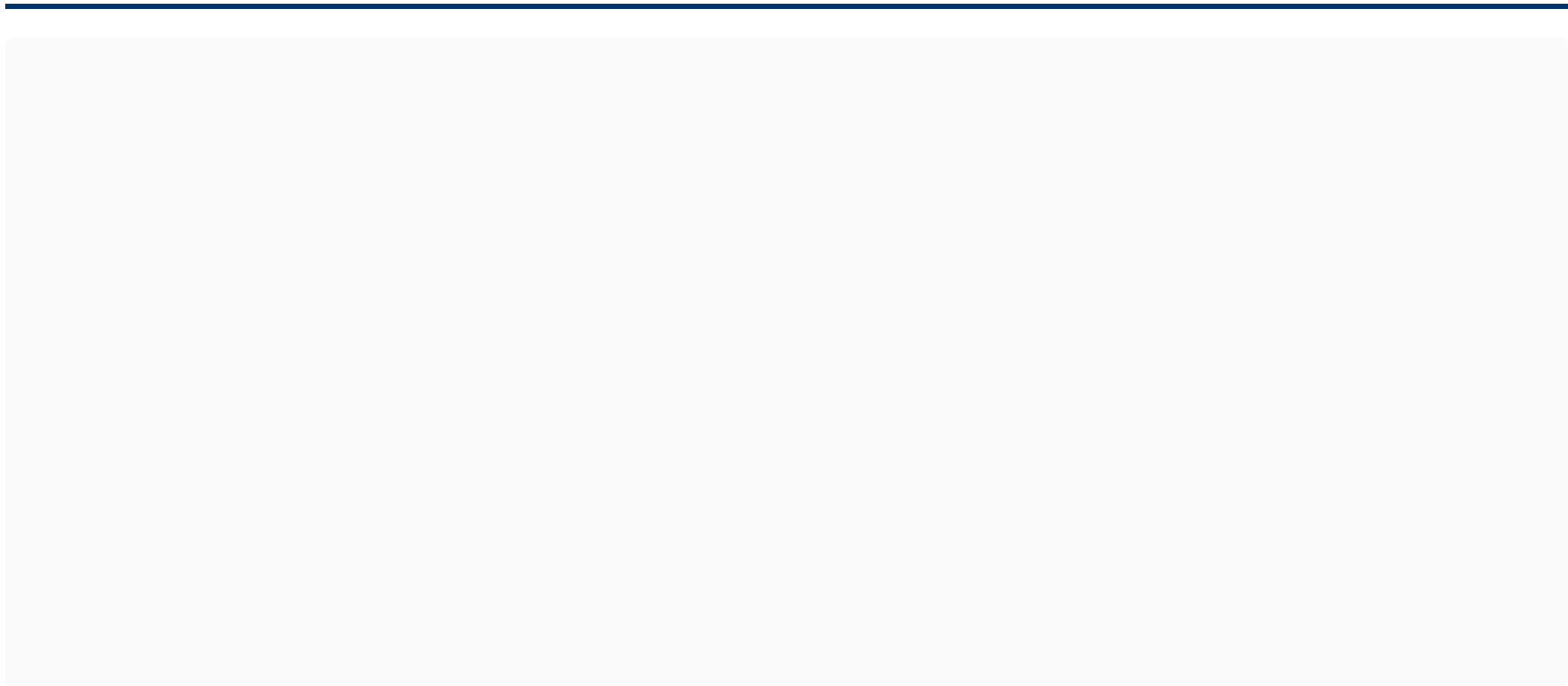


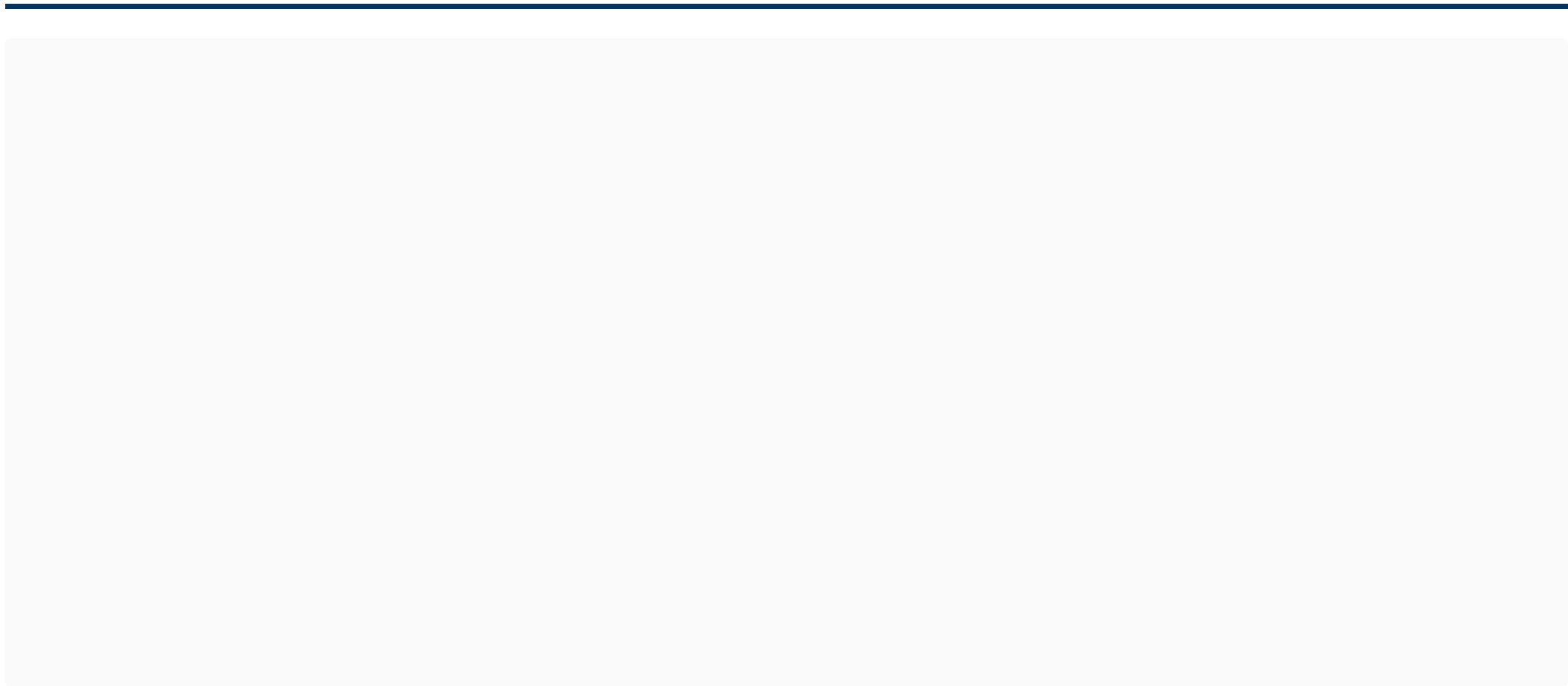












AI Segmentation Task

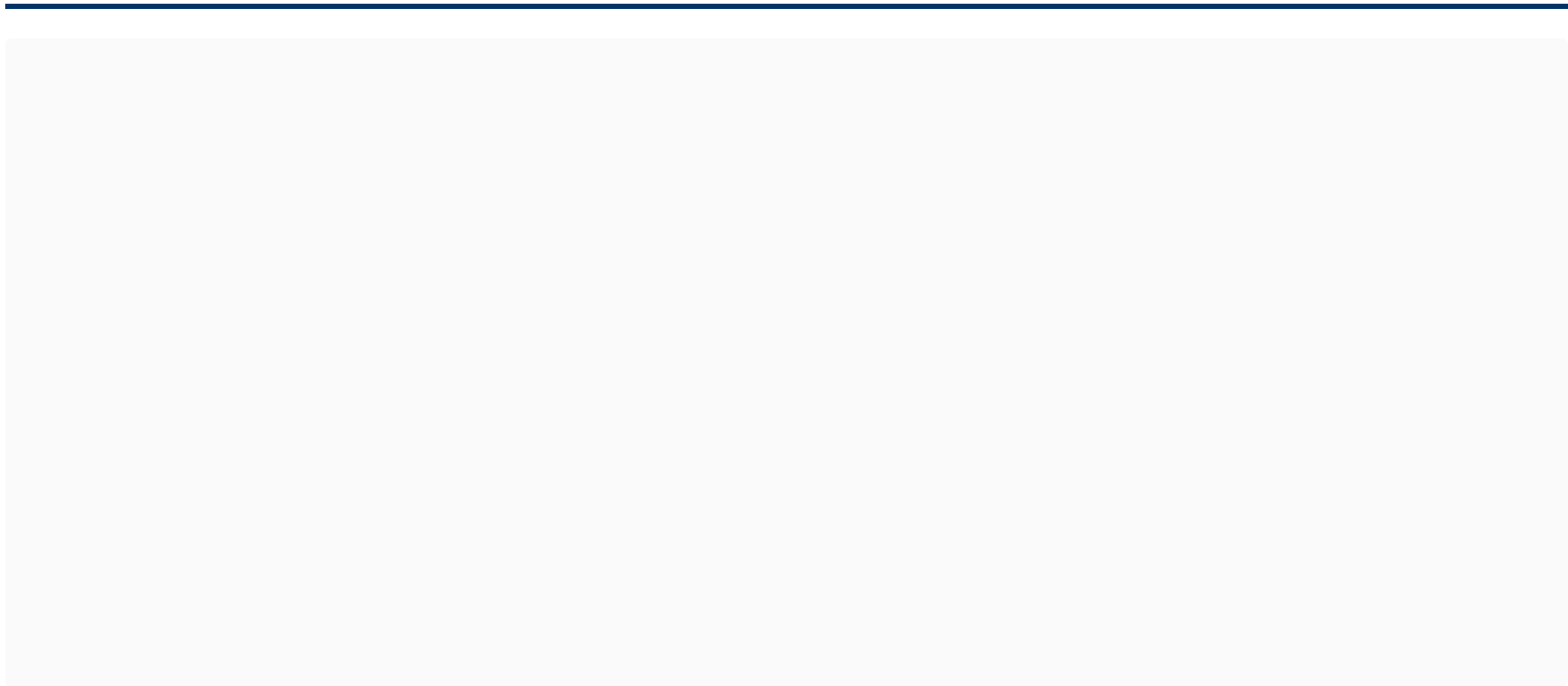
#2: Brain Glioma

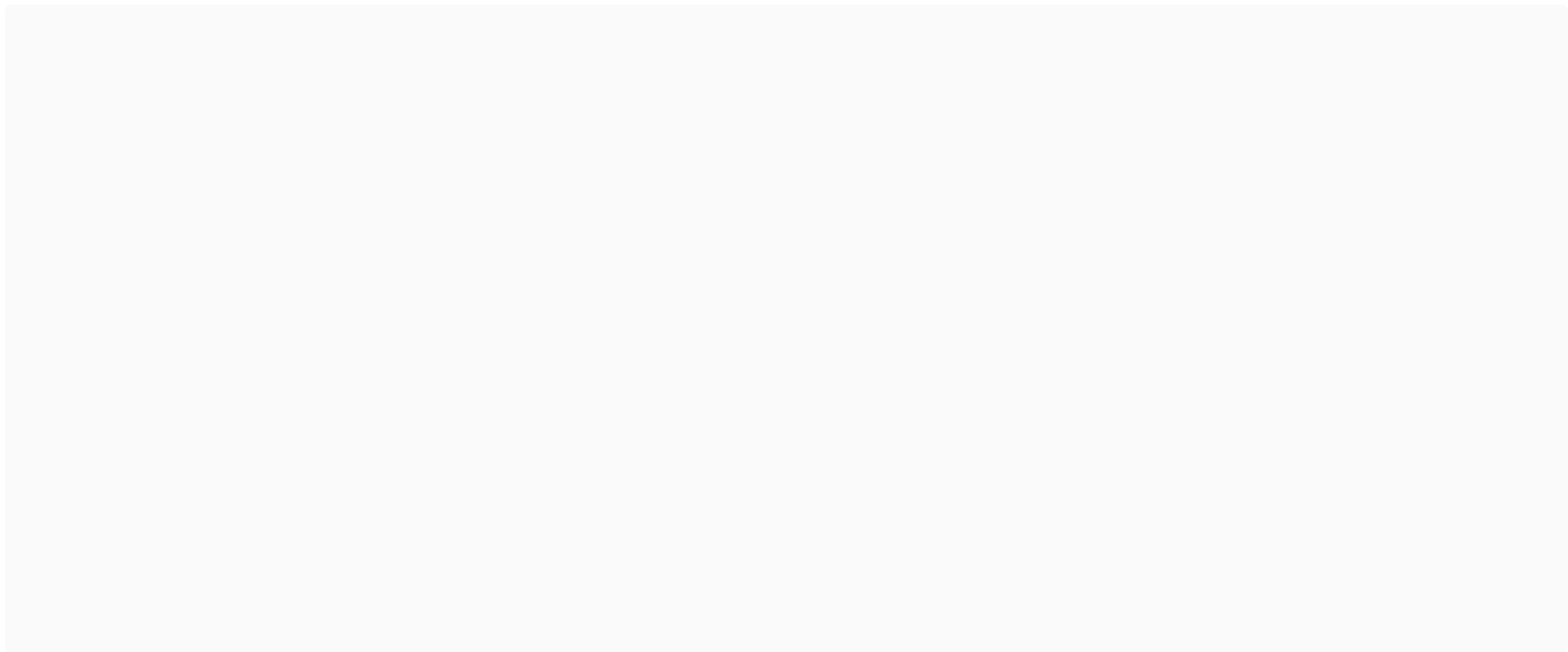
Slicer exhibe los resultados de la segmentación basada en IA usando la Segmentación de Cuerpo Completo TS1- rápida

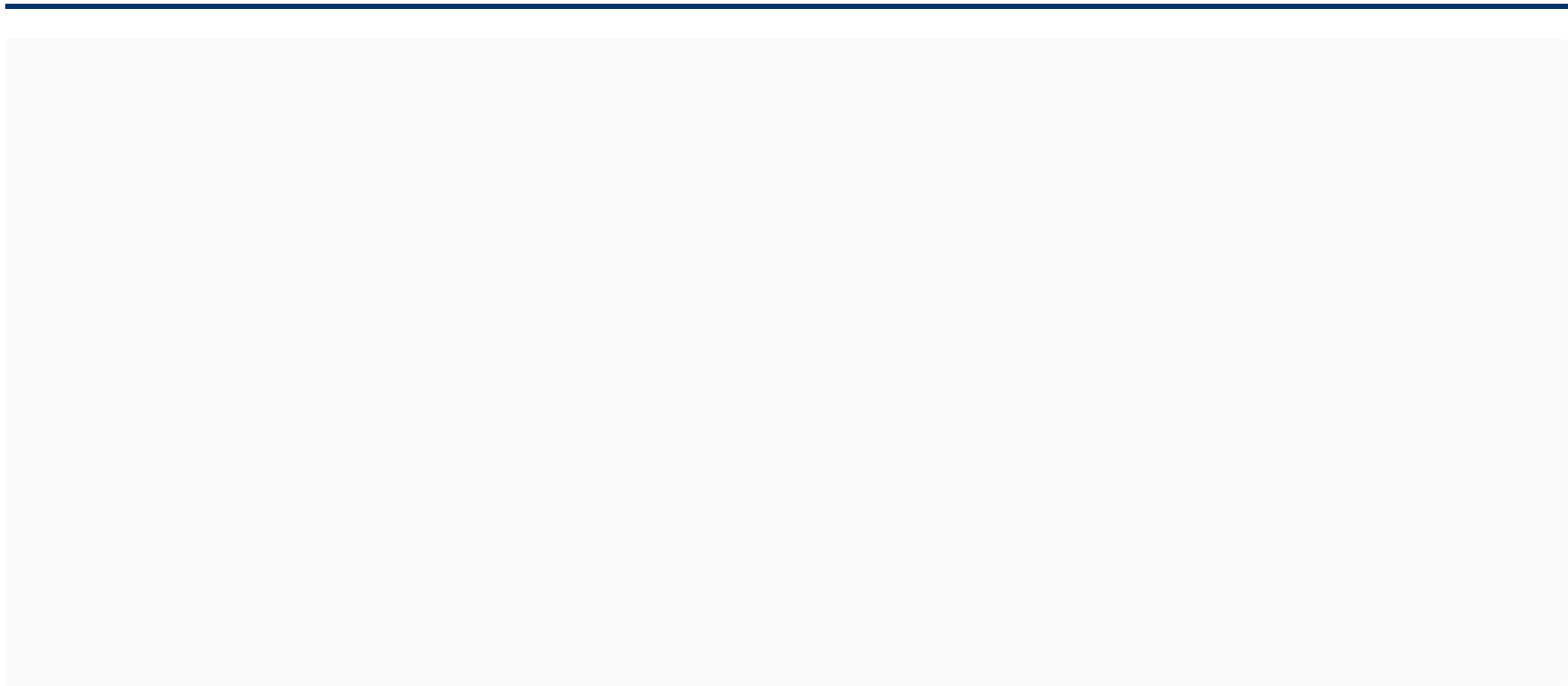
AI-based Segmentation of Neoplasm, Necrosis and Edema in Brain MRI images.

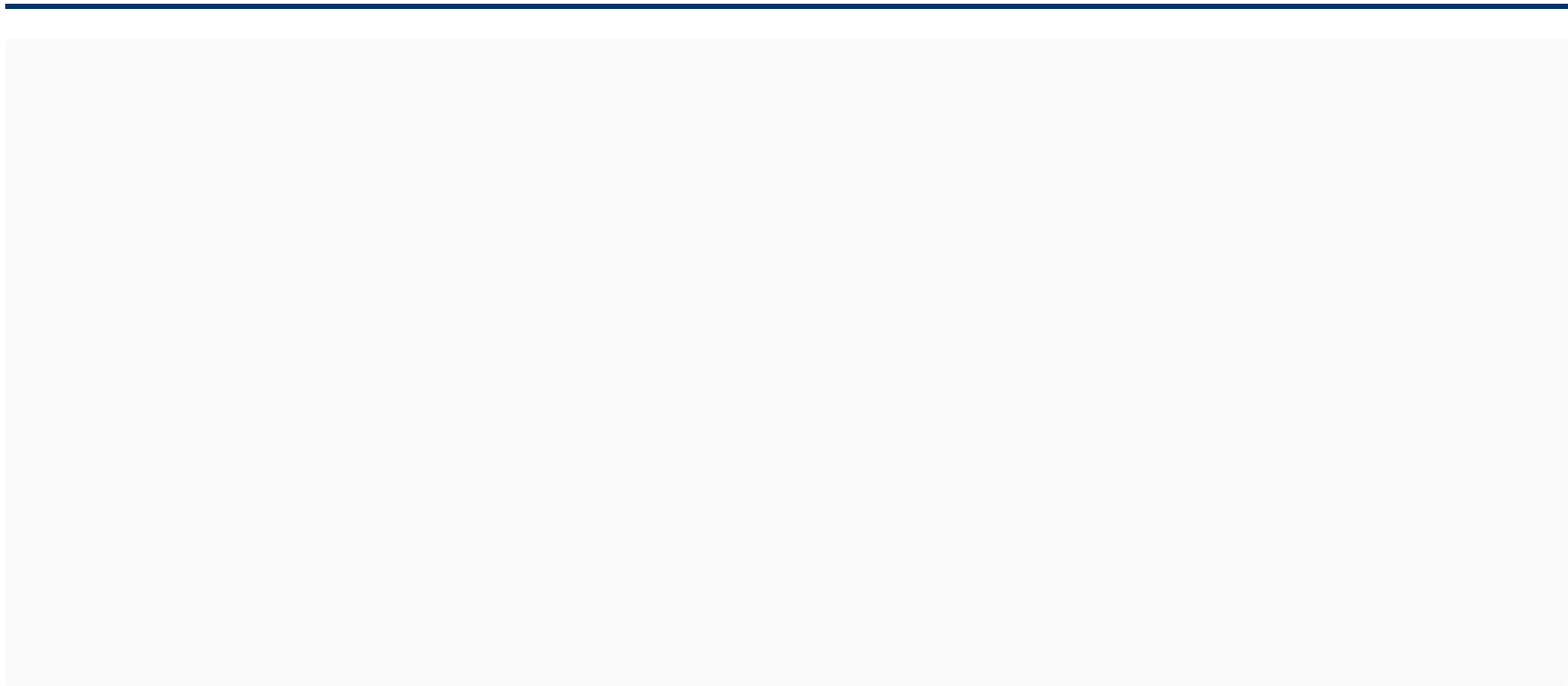
Datasets:

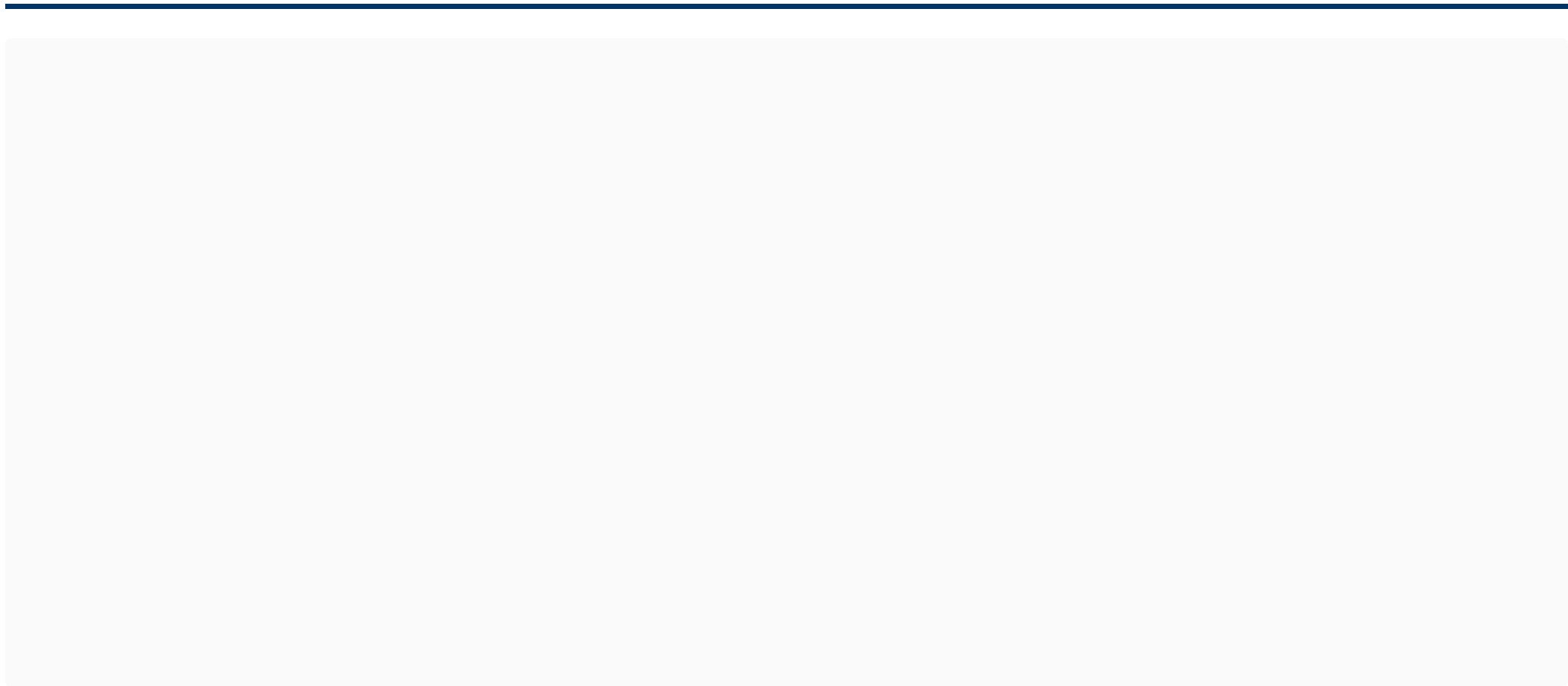
- 1) BraTS-GLI_00005-000-t1n (T1-weighted)
- 2) BraTS-GLI_00005-000-t1c (T1-weighted post-Gd)
- 3) BraTS-GLI_00005-000-t2w (T2-weighted)
- 4) BraTS-GLI_00005-000-t2f (T2-FLAIR)











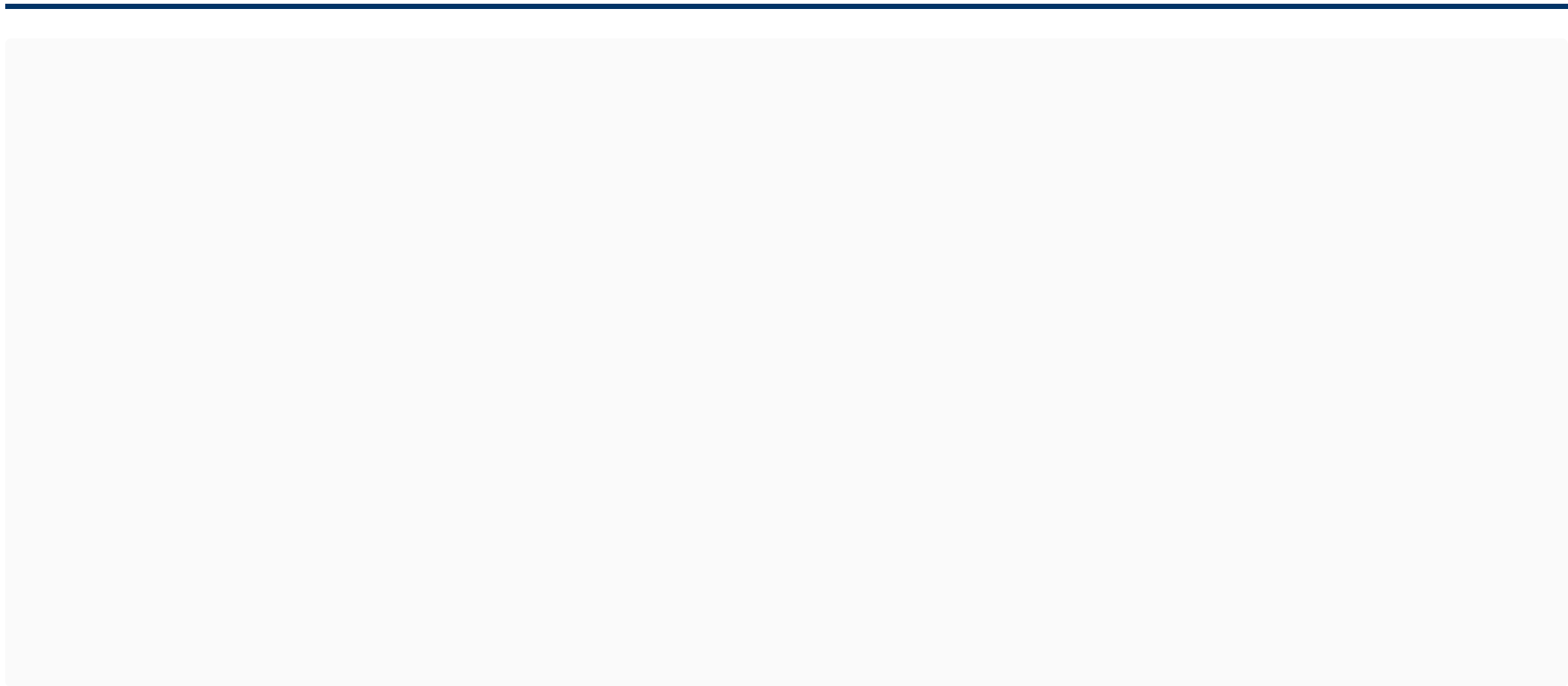
AI Segmentation Task

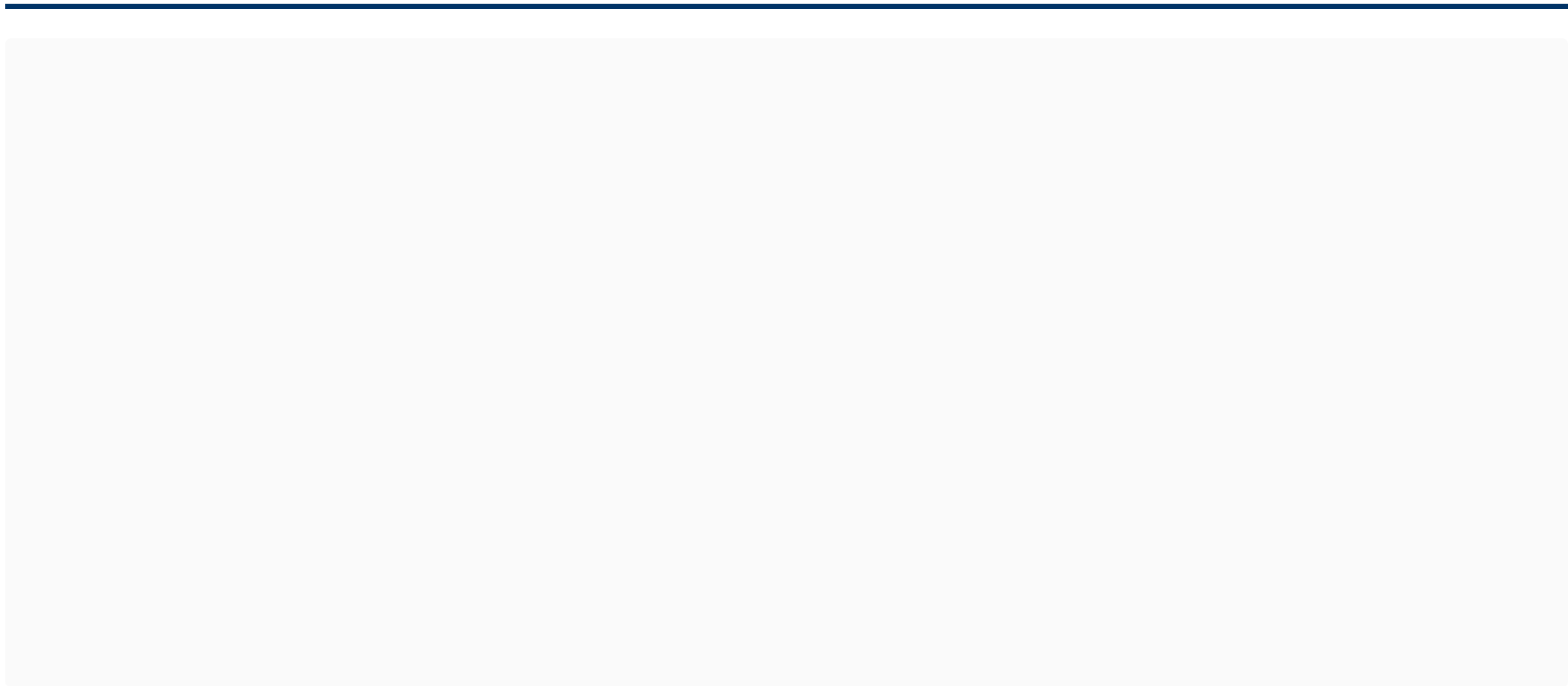
#3: Whole Body Segmentation

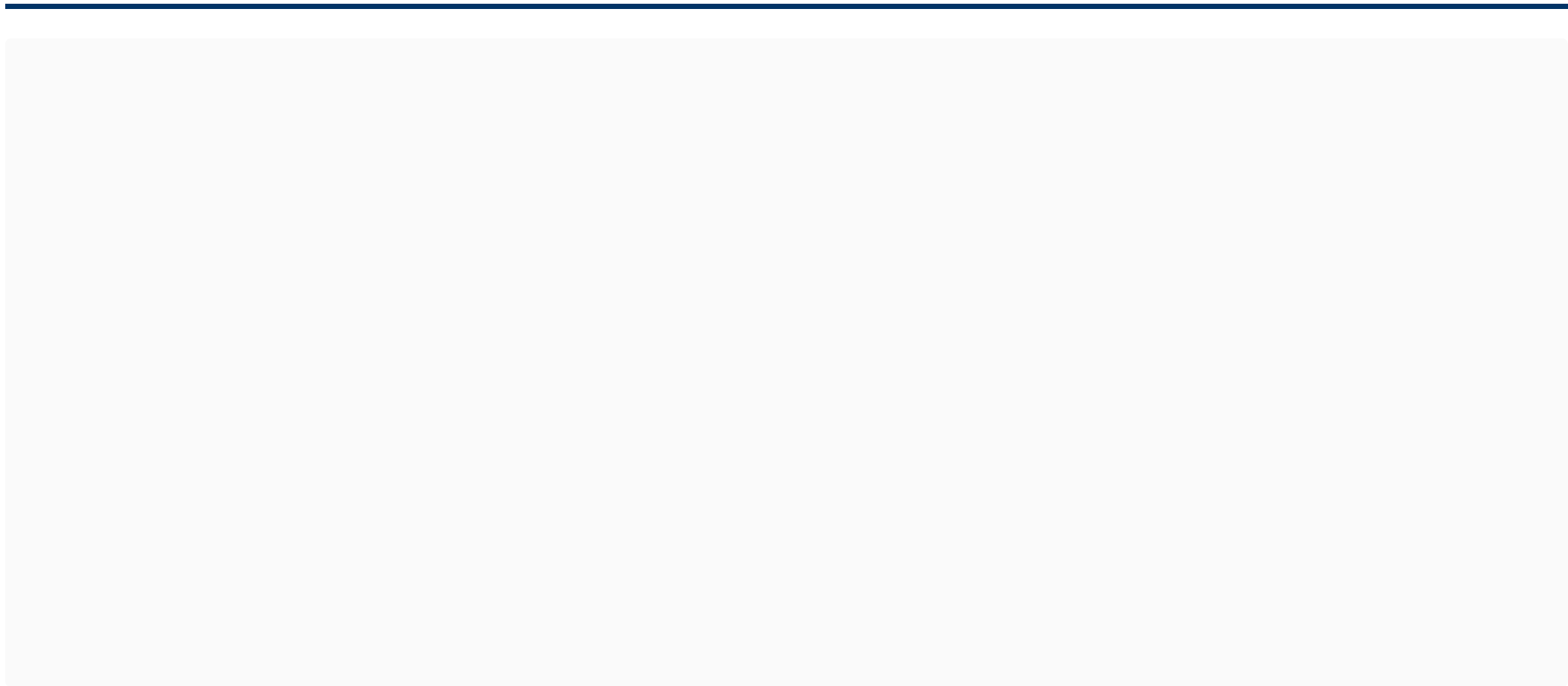
AI-based Segmentation of the whole
body.

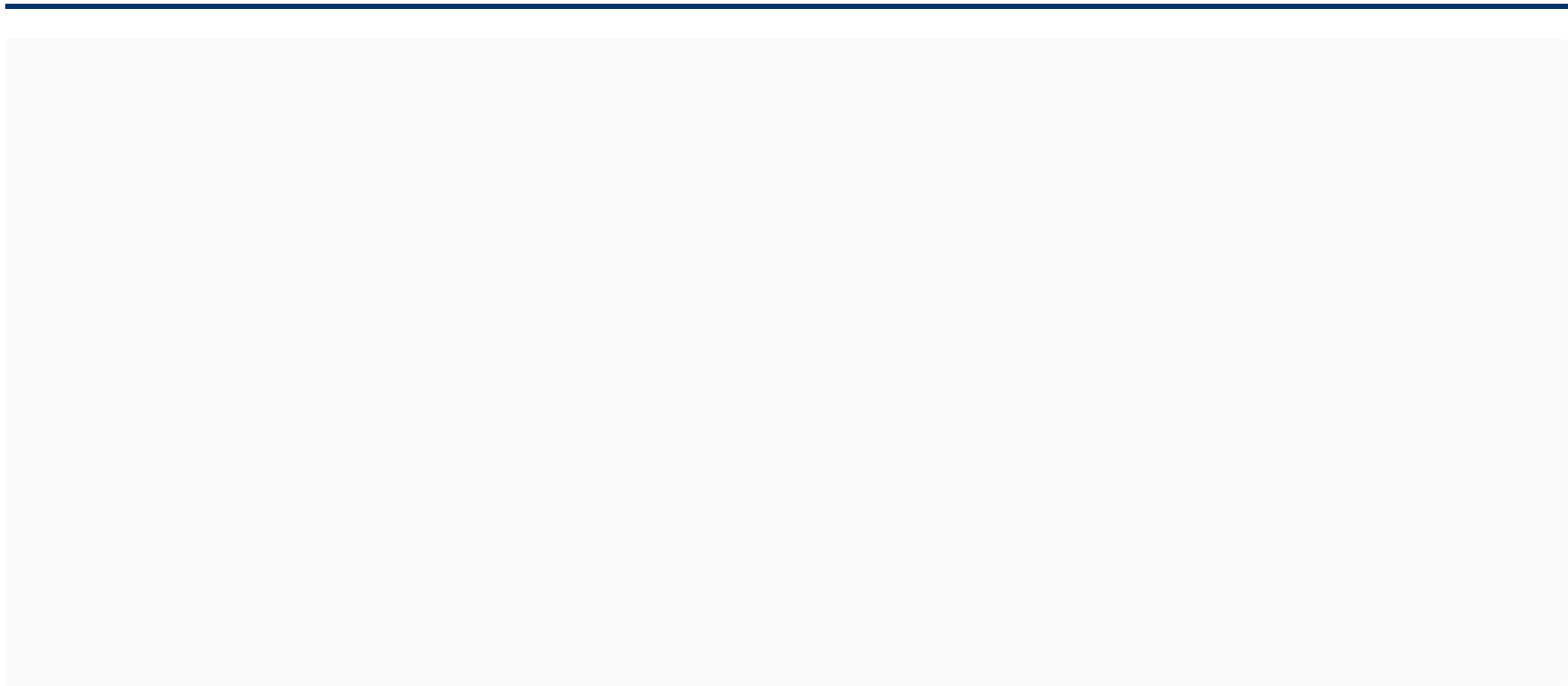
Dataset:

CT_ThoraxAbdomen









Conclusion

The 3D SlicerMONAIAuto3DSeg extension provides fast AI-based segmentation of anatomical and pathological structures.

The module can run on standard laptop and desktop computers with no GPU.

Agradecimientos

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