



**Overview**

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Course Info

# Week 3

AI for Medical Diagnosis

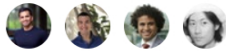
## Week 3

Discuss this week's modules here.

252 threads · Last post 6 hours ago

[Go to forum](#)

## Image segmentation on MRI images



By the end of this week, you will prepare 3D MRI data, implement an appropriate loss function for image segmentation, and apply a pre-trained U-net model to segment tumor regions in 3D brain MRI images.

## Learning Objectives

- Perform image segmentation on 3D MRI data.
- Take random sub-samples from a 3D image.
- Standardize an input image.
- Apply a pre-trained U-Net model.
- Implement a proper loss function for model training (soft dice loss).
- Evaluate model performance by calculating sensitivity and specificity.

[^](#) [Less](#)

## Explore MRI data

▶ **Video:** Medical Image Segmentation 51 sec

[Resume](#)

📅 **Lab:** Explore MRI data 1h

## Image segmentation

▶ **Video:** MRI Data and Image Registration 3 min

▶ **Video:** Segmentation 3 min

📅 **Lab:** Get a sub section 1h

📖 **Reading:** Convolutional Neural networks 10 min

▶ **Video:** 2D U-Net and 3D U-Net 2 min

📖 **Reading:** More about U-Net (Optional) 10 min

📅 **Lab:** Implement U-Net 1h

▶ **Video:** Data augmentation for segmentation 2 min

▶ **Video:** Loss function for image segmentation 3 min

## Practical considerations

- ▶ **Video:** Different Populations and Diagnostic Technology 1 min
- ▶ **Video:** External validation 2 min
- ▶ **Video:** Measuring Patient outcomes 3 min

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## Quiz week 3

- 📖 **Practice Quiz:** Week 3 Quiz: Segmentation on medical images 9 questions

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## Programming: 3D Image Segmentation

- 💻 **Programming Assignment:** Brain Tumor Auto-Segmentation for Magnetic Resonance Imaging (MRI) 3h Due Nov 23, 1:59 AM CST

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## Summary of AI for Medical Diagnosis

- ▶ **Video:** Congratulations! 1 min
- 📖 **Reading:** Acknowledgements 10 min
- 📖 **Reading:** Citations 10 min

