



Overview

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Course Info

Week 3

Advanced Computer Vision with TensorFlow

Week 3

Discuss the topic here.

16 threads · Last post 7 days ago

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Image Segmentation



This week is all about image segmentation using variations of the fully convolutional neural network. With these networks, you can assign class labels to each pixel, and perform much more detailed identification of objects compared to bounding boxes. You'll build the fully convolutional neural network, U-Net, and Mask R-CNN this week to identify and detect numbers, pets, and even zombies!

Less

Learning Objectives

- Describe the conceptual design of fully convolutional neural networks and subsequent models based on it
- Describe the decoder section of the fully convolutional neural network
- Describe two methods of upsampling: simple scaling and transposed convolutions
- Build the encoder and decoder sections of a fully convolutional neural network
- Evaluate a segmentation model's performance using intersection-over-union and Dice score
- Describe the conceptual design of the U-Net model
- Build a U-Net model for image segmentation
- Use the Mask R-CNN to perform instance segmentation

Less

Image Segmentation Overview

Video: Image Segmentation Overview 5 min

Resume

Video: Popular Image Segmentation Architectures 4 min

Reading: References: FCN 10 min

Video: FCN Architecture Details 5 min

Video: Upsampling Methods 3 min

Video: Encoder in Code 2 min

Reading: Reference: CamVid 10 min

Video: Decoder in Code 4 min

Video: Evaluation with IoU and Dice Score 4 min

Lab: Implement a Fully Convolutional Neural Network 1h

U-Net

Video: U-Net Overview 5 min



Reading: Reference: U-Net 10 min

Video: U-Net Code: Encoder 3 min


Video: U-Net Code: Decoder 3 min

Lab: Implement a UNet 1h

Instance Segmentation


-  **Video:** Instance Segmentation 2 min
-  **Lab:** Instance Segmentation Demo 1h

Week 3 Quiz: Image Segmentation

-  **Quiz:** Image Segmentation 9 questions

Due Mar 29, 1:59 AM CDT

Assignment: Image Segmentation of Handwritten Digits

-  **Programming Assignment:** Image Segmentation of Handwritten Digits 1h

Due Mar 29, 1:59 AM CDT

