



Tecnológico de Monterrey

Instituto Tecnológico y de Estudios Superiores de Monterrey

Learn to create U-net

BI2009B. Procesamiento de imágenes médicas para el diagnóstico
(Gpo 300)

Equipo 6

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Código:

```
%1) Learn to create a U-net
%% Create a U-Net network with an encoder-decoder depth of 3.
imageSize = [480 640 3];
numClasses = 5;
encoderDepth = 3;
lgraph = unetLayers(imageSize,numClasses,'EncoderDepth',encoderDepth);
plot(lgraph) % Plot the network
% 2) Train U-Net for semantic segmentation
%% Load training images and pixel labels
dataSetDir = fullfile(toolboxdir('vision'),'visiondata','triangleImages');
imageDir = fullfile(dataSetDir,'trainingImages');
labelDir = fullfile(dataSetDir,'trainingLabels');
%% Create an imageDatastore object to store the training images.
imds = imageDatastore(imageDir);
%% Define the class names and their associated label IDs.
classNames = ["triangle","background"];
labelIDs = [255 0];
%%
% Create a pixelLabelDatastore object to store the ground truth pixel
% labels for the training images.
pxds = pixelLabelDatastore(labelDir,classNames,labelIDs);
%% Crating the U-Net network
imageSize = [32 32];
numClasses = 2;
lgraph = unetLayers(imageSize, numClasses);
ds = combine(imds,pxds); % Datastore for training the network.
%% Training options
options = trainingOptions('sgdm', ...
    'InitialLearnRate',1e-2, ...
    'MaxEpochs',30, ...
    'VerboseFrequency',10);
%% Train the network
net = trainNetwork(ds,lgraph,options);
```

Resultados:

```
>> d
Training on single CPU.
Initializing input data normalization.
```

Epoch	Iteration	Time Elapsed (hh:mm:ss)	Mini-batch Accuracy	Mini-batch Loss	Base Learning Rate
1	1	00:00:12	78.79%	1.5972	0.0100
10	10	00:02:06	96.08%	0.4291	0.0100
20	20	00:04:10	94.62%	0.0935	0.0100
30	30	00:06:09	94.65%	0.0910	0.0100

```
Training finished: Max epochs completed.
>>
```

