# Image Segmentation Using Deep Learning: A Survey

<https://arxiv.org/pdf/2001.05566.pdf>

## Abstract

Image segmentation helps us understand what the image consists of and is a very important topic in image processing and computer vision. It has many applications such as image compression, scene understanding, locating objects in satellite images, etc. Over the time many algorithms have been developed for image segmentation but with the recent development of deep learning in computer vision field many deep learning models for image segmentation have also emerged.

In this study we aim to provide a comprehensive review of a wide variety of image segmentation approaches using deep learning techniques.

## DL-based image segmentation models

The various DL-based image segmentation models included in this survey are:

* Fully Convolutional networks
* Convolutional Models with Graphical Models
* Encoder-Decoder Based Models
* Multi-Scale and Pyramid Network Based Models
* R-CNN Based Models (for Instance Segmentation)
* Dilated Convolutional Models and DeepLab Family
* Recurrent Neural Network Based Models
* Attention-Based Models
* Generative Models and Adversarial Training
* CNN Models with Active Contour Models

This survey also examines the most widely used datasets (2D, 2.5D, 3D) for image segmentation. It also talks about popular metrics used to evaluate performance of various DL-based image segmentation models and provide the quantitative performance of some of the good models on popular datasets.