

## 1. Work and Literature Reviewed

Mirikharaji et al. (2023) show a [survey](#) of deep learning based skin lesion segmentation, which reviews 177 research papers. The deep learning approaches discussed include:

- U-Net and its variants (Attention U-Net, Residual U-Net)
- Fully Convolutional Networks (FCNs)
- DeepLab family (DeepLabv3, DeepLabv3+)
- Mask R-CNN
- TransUNet-based models

The work considers problems such as class imbalance, variations in lesion appearances, and artifacts. It also discusses shortcomings in model performance, data augmentation, selection of loss functions, and evaluation metrics.

## 2. Dataset Name and Link ISIC2018:

<https://www.kaggle.com/datasets/tschandl/isic2018-challenge-task1-data-segmentation>

## 3. Dataset Description

### **3.1. Dataset Class Label and Information**

Training Images: 2,594 dermoscopic images (.jpg)

Segmentation Masks: Corresponding binary masks (.png) depicting lesions' outlines.

### **3.2. Dataset Metadata Information**

Picture ID: Unique identification number for every picture.

Mask of Ground Truth: Binary mask where white pixels (255) represent lesion areas and black pixels (0) represent the background.

Measurements: Different dimensions, often cropped to a size located at the input of the model of choice for training.

Color Mode: RGB

### **3.3. Dataset Restrictions and Difficulties**

#### **3.3.1 Missing Data:**

No data on patient demographics and lesion diagnoses.

#### **3.3.2 Possible Improvement:**

I suggest considering adding labels for various types of lesions. Additionally, exploring methods for generating synthetic data, like GAN and attaching further datasets that should boost the model's capability of generalization.

### **3.4 Frameworks:**

PyTorch and TensorFlow, along with libraries like scikit-learn for evaluation metrics, OpenCV for image processing, and Albumentations for data augmentation.

### **3.5 Available Codes Using the ISIC2018 Dataset**

1. [U-Net / DoubleU-Net Implementation](#)
2. [Skin Lesion Segmentation in TensorFlow 2.0](#)
3. [ISIC Melanoma Segmentation](#)
4. [Skin Lesion Segmentation Using U-Net](#)