# DermaTransNet

DermaTransNet: Where Transformer Attention Meets U-Net for Skin Image Segmentation

## Official Implementation of DermaTransNet

### Details of Model

This study introduces a novel attention-based encoder-decoder architecture designed for precise segmentation of skin layers (Epidermis, Dermis, Hypodermis, Keratin) from stained whole slide image samples. The proposed Transformer-based encoder leverages a multi-axis structure to effectively capture both global and local features, which are then transmitted to the decoder through an attention-based gated skip connection. The attention-mixing decoder integrates multi-head self-attention, spatial attention, and squeeze excitation modules to enhance spatial information gain and refine segmentation accuracy.

### Requirements

- loguru

- tqdm

- pyyaml

- pandas

- matplotlib

- scikit-learn

- scikit-image

- scipy

- opencv-python

- seaborn

- albumentations

- tabulate

- warmup-scheduler

- torch==1.11.0+cu113

- torchvision==0.12.0+cu113

- mmcv-full -f https://download.openmmlab.com/mmcv/dist/cu113/torch1.11.0/index.html

- timm

- einops

- pthflops

- torchsummary

- thop

### Datasets

This study uses the following Datasets:

- QueensLand Dataset <https://espace.library.uq.edu.au/view/UQ:8be4bd0>

- HistoSeg Dataset <https://data.mendeley.com/datasets/vccj8mp2cg/1>

### Preparing the data for training

Whole slide image samples were patched into 256x256 sized patches to reduce computational complexity.

### Training

To train the model, Run trainer.py

### Testing (Model Evaluation)

For testing the model, Run test.py