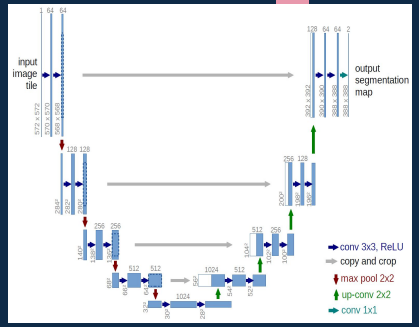
# Intro

## Project Goal

✅ Improve training efficiency of Semantic Segmentation

## Model Design




prune

## Method Design

🤯 Model structure – Encoder & Decoder – Prune

Analyze the sensitivity of Encoder and Decoder

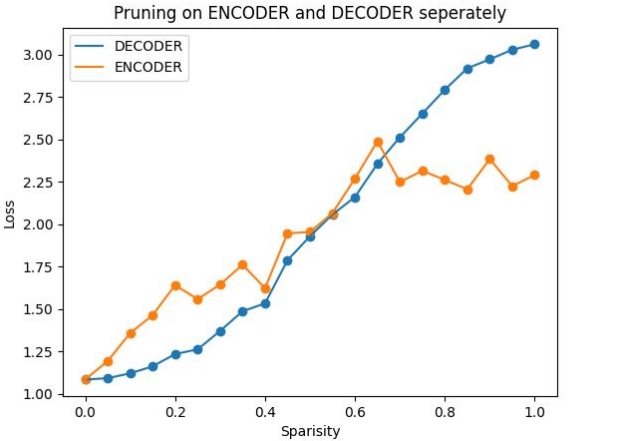
Grid search on Encoder and Decoder

## Dataset–Semantic Drone Dataset


- 400 images
- 6000*4000 ➡️ 768*512
- 24 classes (1 unlabeled)

## Grid Research

| Trial Goal | Sparsity Grid Step | Encoder/ Decoder | Note |
|---|---|---|---|
| Unstructured Random/L1 | 10%×10% | Both, Grid Search | Global pruning |
| Structured L1/L2 | 10%×10% | Both, Grid Search | layer-wise pruning |
| Pruning Position | 20% | Encoder Only | Encoder: Structured L1 Decoder: Unstructured Random |




## Observation (p = pruning ratio)

1. For small-scale pruning (p<50%):
   - Encoder: immediate response,
   - Decoder: delayed response;
2. For large-scale pruning (p>50%):
   - Encoder: less sensitive;
   - Decoder: exp-decay behavior.
3. Position:
   - Lower layers more sensitive
   - (UNet structure)
4. Scoring function:
   - Tolerance to unstructured L1 method.
   - Deeper layers: more parameters in filters, but less useful connection