



“Clever Switches” Team 4

AI HERO 2 Challenge: Use Case Energy

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Understanding the data & goal

RGB



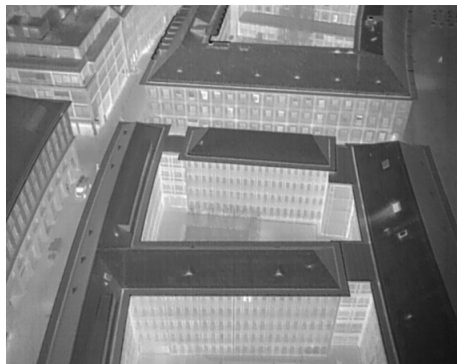
Depth



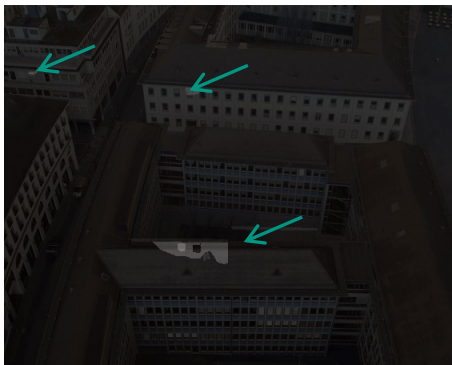
Boxes



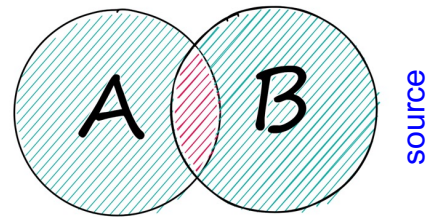
Thermal



Masks



$$\text{Jaccard} = \frac{\text{intersection}(A, B)}{\text{union}(A, B)}$$



Intersection-over-Union or IoU

Day 1 strategies

- Used preloaded weights for backbone `ResNet50_Weights.DEFAULT`
- We added mixed precision (autocast)
 - no real impact (backbone loaded, not training from scratch)
- Normalized the input data to what the model expects
 - it was not being passed
- Using only 1 GPU
- Loading weights of best run
 - probably overfitting
 - didn't load optimizer checkpoint

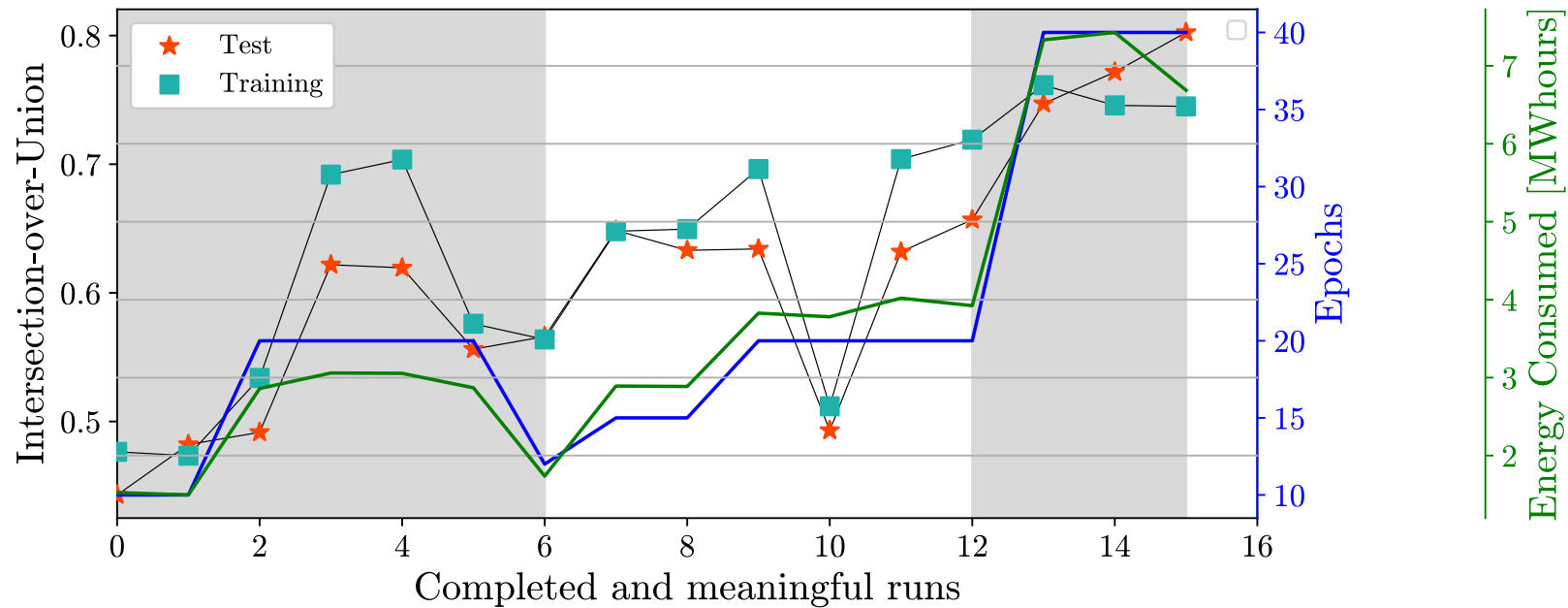


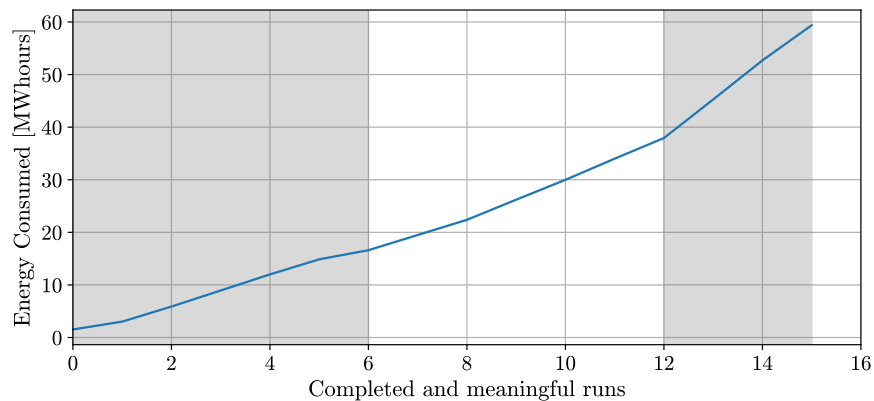
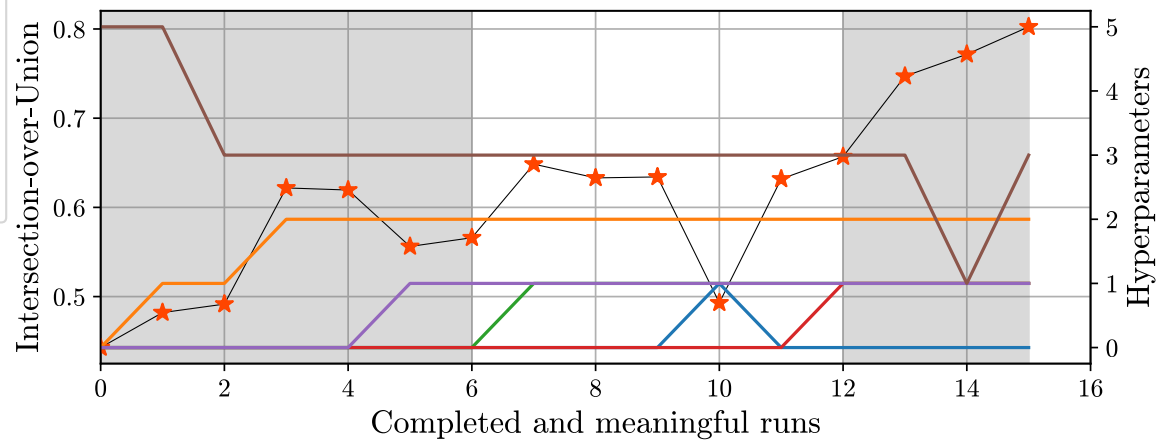
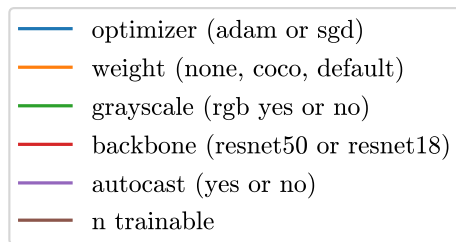
Day 2 strategies

- Parallelized code to run in 4 GPUs with `DistributedDataParallel, DistributedSampler`
 - increased GPU utilization but more time per epoch
 - quite difficult to implement
- Changed backbone to `resnet18`
 - lighter model → faster inference + faster training
- Changed 3 RGB channels for 1 channel in grayscale
 - backbone weights pre-trained expects 3 channels not 5
 - no need to re-train first conv layer
- Realizing we can only use models that return masks
 - we wanted to use semantic segmentation method, no time to adapt
 - stick with original model, tune hyperparameters

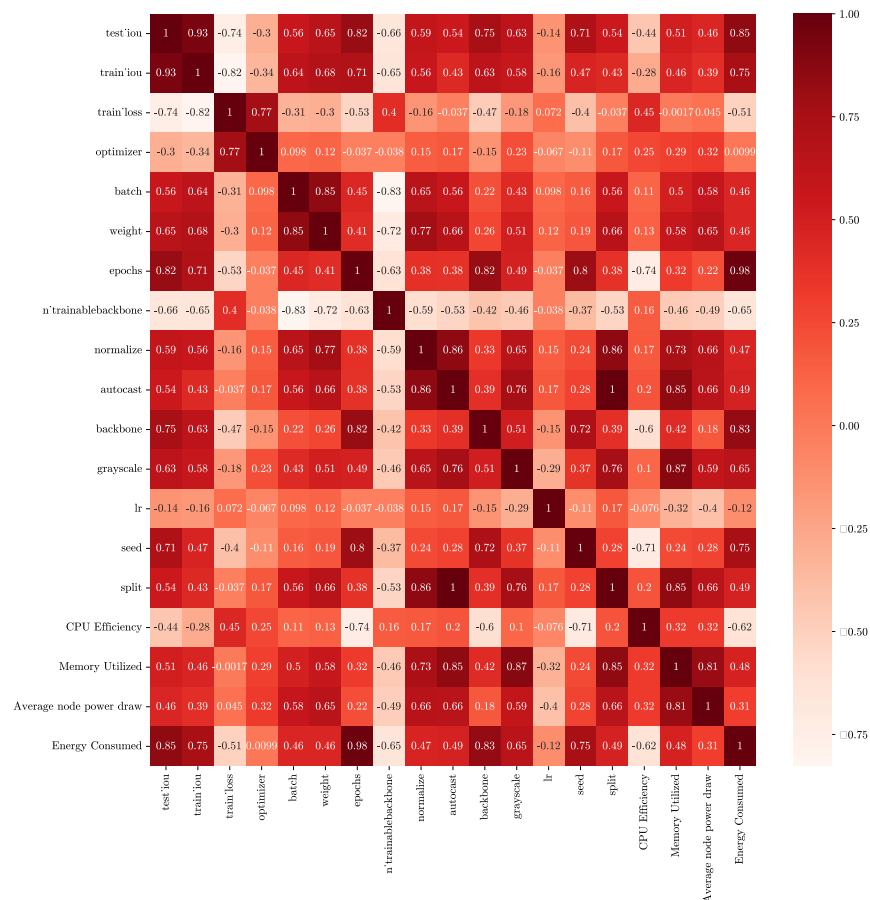
Day 3 strategies

- Reduce number of trainable backbone layers
 - faster training (?)
- Increase number of epochs for training
 - better accuracy
- Increase number of batches for prediction
 - faster inference





Trying some feature correlation...



**We had a lot
of fun 😊**

