MODEL-README
Trained Model Weights

All trained model checkpoints from our 3-phase training journey.

Files

File	Phase	Val IoU	Size	Description
`phase2_best_model_iou0.4036.pth`	Phase 2	0.4036	28MB	Best checkpoint from Phase 2 (epoch 26). Contains model state dict + optimizer state + config. Uses DINOv2 ViT-Small backbone + ConvNeXt head.
`phase3_best_model_iou0.5161.pth`	Phase 3	0.5161	39MB	⭐ **Best overall model.** Best checkpoint from Phase 3 (epoch 40). Contains model state dict + optimizer state + config. Uses DINOv2 ViT-Base backbone + UPerNet head.
`segmentation_head.pth`	Phase 3	0.5161	9.3MB	Head-only weights extracted from Phase 3 best checkpoint. This is what `test_segmentation.py` loads for inference. Smaller file because it only contains UPerNet head parameters (no optimizer state).

How to Use

For Inference (test images)

```
# test_segmentation.py loads segmentation_head.pth automatically
python TRAINING_SCRIPTS/test_segmentation.py
```

For Resuming Training

```
checkpoint = torch.load('MODELS/phase3_best_model_iou0.5161.pth')
model.load_state_dict(checkpoint['model_state_dict'])
optimizer.load_state_dict(checkpoint['optimizer_state_dict'])
print(f"Resuming from epoch {checkpoint['epoch']}, IoU=
{checkpoint['val_iou']:.4f}")
```

Why No Phase 1 Model?

Phase 1's baseline script only saved the final epoch weights (no best checkpoint). The final model (IoU=0.2971) has been superseded by Phase 2 and 3, so it isn't preserved here.