Training details

Date: 25/09/2025

  parser = argparse.ArgumentParser()

    parser.add\_argument("--data\_dir", type=str, default="Dataset", help="dataset folder with images/ and labels/")

    parser.add\_argument("--backbone", type=str, default="hrnet\_w18", help="timm backbone name")

    parser.add\_argument("--img\_size", type=int, default=640, help="input crop size")

    parser.add\_argument("--batch\_size", type=int, default=16)

    parser.add\_argument("--epochs", type=int, default=50)

    parser.add\_argument("--lr", type=float, default=1e-4)

    parser.add\_argument("--lr\_step", type=int, default=15)

    parser.add\_argument("--lr\_gamma", type=float, default=0.5)

    parser.add\_argument("--head\_hidden", type=int, default=512)

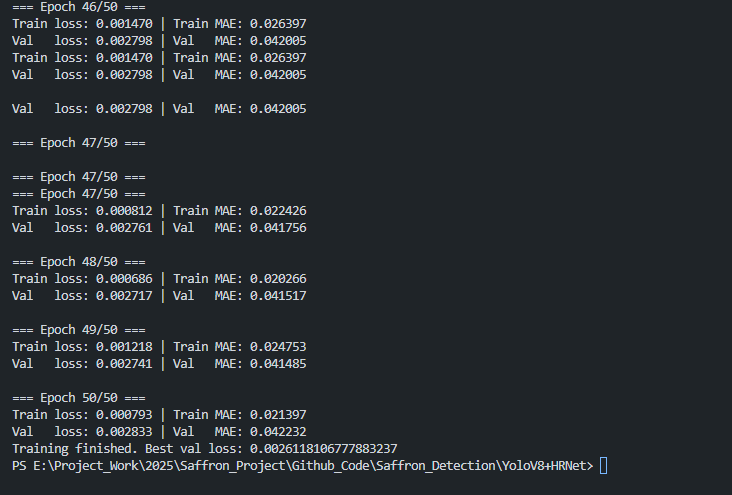
    parser.add\_argument("--val\_split", type=float, default=0.15)

    parser.add\_argument("--num\_workers", type=int, default=4)

    parser.add\_argument("--out", type=str, default="hrnet\_pluck.pth")

    parser.add\_argument("--resume", type=str, default="")

    parser.add\_argument("--device", type=int, default=0, help="gpu device id, set -1 for cpu")



Version\_002(Training Code)

 **Padding to preserve aspect ratio** (no distortion)

 **Data augmentation** (rotation, color jitter, horizontal flip)

 **SmoothL1Loss** for stable regression

 **Mixed precision training** for faster training and memory efficiency

 **Validation metrics include pixel distance**

 **Checkpointing best model**

**Key Improvements in This Version**

1. **Original aspect ratio preserved** via padding → no distortion of flower.
2. **Augmentation added:** rotation ±15°, color jitter, horizontal flip.
3. **SmoothL1Loss** instead of MSE → more robust to label noise/outliers.
4. **Mixed precision training** (autocast + GradScaler) → faster training + reduced memory.
5. **Pixel distance metric** in validation → easier to interpret in real units.
6. **Checkpointing best model** separately (\_best.pth).
7. **Inference matches training preprocessing** → keypoints map correctly.