# Supplementary Material for
# MetaFuse: A Pre-trained Fusion Model for Human Pose Estimation

## 1. Additional Results on Panoptic Dataset

Table 1. 2D pose estimation accuracy on the Panoptic dataset. The second column represents the number of samples for finetuning the pre-trained model. We report results for three joints and also the average result over all joints.

| Methods | Samples | Shld. | Knee. | Ankle. | Avg |
|---|---|---|---|---|---|
| *No-Fusion* | – | 89.9 | 79.8 | 89.7 | 88.9 |
| *NaiveFuse*$^{50}$ | 50 | 88.1 | 82.3 | 87.6 | 85.1 |
| *MetaFuse*$^{50}$ | | 91.2 | 85.7 | 90.8 | **88.9** |
| *NaiveFuse*$^{100}$ | 100 | 88.8 | 83.7 | 87.6 | 86.5 |
| *MetaFuse*$^{100}$ | | 91.4 | 86.3 | 90.9 | **89.5** |
| *NaiveFuse*$^{200}$ | 200 | 90.9 | 85.1 | 88.1 | 88.3 |
| *MetaFuse*$^{200}$ | | 92.2 | 86.9 | 91.6 | **90.6** |
| *NaiveFuse*$^{500}$ | 500 | 91.6 | 85.8 | 89.9 | 90.2 |
| *MetaFuse*$^{500}$ | | 93.2 | 88.0 | 91.5 | **91.2** |

Table 2. The 3D pose MPJPE errors obtained by the baseline methods on the Panoptic dataset.

| Methods | Samples | Average MPJPE |
|---|---|---|
| *No-Fusion* | – | 40.47mm |
| *NaiveFuse*$^{50}$ | 50 | 43.39mm |
| *MetaFuse*$^{50}$ | | **37.27**mm |
| *NaiveFuse*$^{100}$ | 100 | 42.58mm |
| *MetaFuse*$^{100}$ | | **36.02**mm |
| *NaiveFuse*$^{200}$ | 200 | 35.60mm |
| *MetaFuse*$^{200}$ | | **31.78**mm |
| *NaiveFuse*$^{500}$ | 500 | 33.50mm |
| *MetaFuse*$^{500}$ | | **30.88**mm |

## 2. Algorithm of Meta-Training

**Algorithm 1** Meta-Training of *MetaFuse*

**Input:** $\{\mathcal{T}_1, \mathcal{T}_2, \cdots, \mathcal{T}_N\}$ : Each $\mathcal{T}_i$ is associated with a small dataset from a particular camera pair.
$\alpha, \beta$ : Step size, hyper-parameters

**Output:** $\theta, \omega^{base}$ : Pre-trained fusion model

1: Randomly initialize $\theta, \omega^{base}$
2: **for** each $\mathcal{T}_i \in \{\mathcal{T}_1, \mathcal{T}_2, \cdots, \mathcal{T}_N\}$ **do**
3: Sample $K$ images $\mathcal{D}_i^{train}$ from $\mathcal{T}_i$
4: Compute $\theta', \omega^{base\prime}$ with gradient descent on $\mathcal{D}_i^{train}$
$\theta' = \theta - \alpha \nabla_\theta \mathcal{L}_{\mathcal{D}_i^{\text{train}}}(\boldsymbol{\omega}^{\text{base}}, \theta)$
$\boldsymbol{\omega}^{\text{base}\prime} = \boldsymbol{\omega}^{\text{base}} - \alpha \nabla_{\boldsymbol{\omega}^{\text{base}}} \mathcal{L}_{\mathcal{D}_i^{\text{train}}}(\boldsymbol{\omega}^{\text{base}}, \theta)$
5: Sample other $K$ images $\mathcal{D}_i^{test}$ from $\mathcal{T}_i$
6: Update $\theta \leftarrow \theta - \beta \nabla_\theta \mathcal{L}_{\mathcal{D}_i^{\text{test}}}(\boldsymbol{\omega}^{\text{base}\prime}, \theta')$
$\boldsymbol{\omega}^{\text{base}} \leftarrow \boldsymbol{\omega}^{\text{base}} - \beta \nabla_{\omega^{base}} \mathcal{L}_{\mathcal{D}_i^{\text{test}}}(\boldsymbol{\omega}^{\text{base}\prime}, \theta')$
7: **end for**
8: **return** $\theta, \omega^{base}$