Proposed Method (Continued)

- Step #2: Selective pseudo labeling
  - Applied independently for each image category.
  - For the j-th unlabeled image, a pairwise distance is calculated.
    \[
    d_j = \frac{1}{n_j} \sum_{i=1}^{n_j} \| f(x_i^j) - f(x_i^j) \|_1
    \]
  - Sort the unlabeled images based on \( d_j \) and determine \( n'_u \) samples as pseudo labels.
  - The pipeline of the selective pseudo labeling scheme.

- Step #3: Label noise-robust learning via progressive self-training
  - The selected pseudo labels are still not completely reliable (i.e., noisy).
  - Inspired by [17], we alternately update the network and the noisy labels set.
  - Final objective function
    - We conduct SSDA by combining the baseline method and our proposed scheme.

Experimental Results & Analysis

- Experimental setups
  - Datasets: LSDAC [3], Office-Home [18], and Office [19].
  - Baseline network architectures: AlexNet [27], VGG-16 [28], and ResNet-34 [29].
  - Implementation: PyTorch 1.1.0 & NVIDIA Titan-X.
- DA methods in comparison
  - S+T, DANN [4], ADR [20], CDAN [5], ENT [21], MME [14].
- Comparative evaluation results
  - Results on the LSDAC dataset (ResNet-34)

\[
\begin{align*}
\text{S+T} & \quad \text{DANN} & \quad \text{ADR} & \quad \text{CDAN} & \quad \text{ENT} & \quad \text{MME} & \quad \text{Ours} \\
1\text{-shot} & 56.9 & 58.4 & 57.6 & 62.5 & 62.6 & 66.4 & 69.0 \\
3\text{-shot} & 60.0 & 60.7 & 60.4 & 66.5 & 67.6 & 68.9 & 71.0
\end{align*}
\]

- Results on the Office-Home dataset (VGG-16)

\[
\begin{align*}
\text{S+T} & \quad \text{DANN} & \quad \text{ADR} & \quad \text{CDAN} & \quad \text{ENT} & \quad \text{MME} & \quad \text{Ours} \\
1\text{-shot} & 57.4 & 60.0 & 57.4 & 55.8 & 51.6 & 62.7 & 63.9 \\
3\text{-shot} & 62.9 & 63.9 & 63.0 & 61.8 & 64.8 & 67.6 & 68.6
\end{align*}
\]

- Results on the Office dataset (VGG-16)

\[
\begin{align*}
\text{S+T} & \quad \text{DANN} & \quad \text{ADR} & \quad \text{CDAN} & \quad \text{ENT} & \quad \text{MME} & \quad \text{Ours} \\
1\text{-shot} & 68.7 & 69.8 & 69.4 & 65.9 & 70.6 & 73.4 & 76.4 \\
3\text{-shot} & 73.3 & 75.0 & 73.7 & 72.9 & 75.3 & 77.0 & 78.1
\end{align*}
\]

References