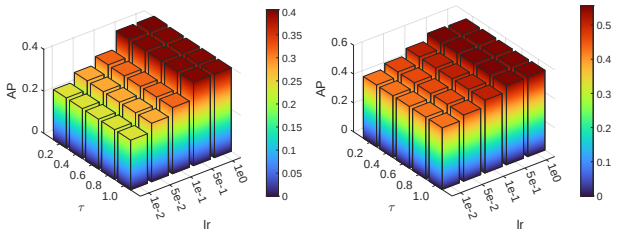
Attention-induced embedding imputation for incomplete multi-view partial multi-label classification

Anonymous submission



(a) Corel5k (b) Pascal07

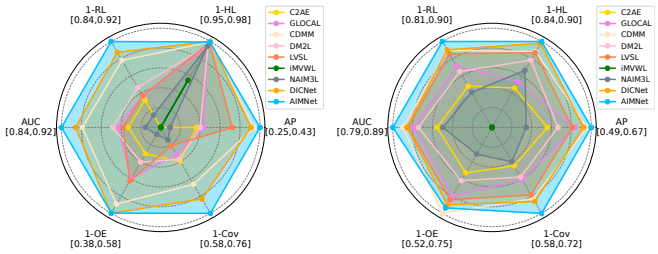
Figure 1: The AP value versus lr and τ on the (a) Corel5k dataset and (b) Pascal07 dataset with 50% available instances, 50% missing labels, and 70% training samples.

Method	Sources	Multi-view	Missing-view	Missing-label
C2AE	AAAI '17	✗	✗	✓
GLOCAL	TKDE '17	✗	✗	✓
CDMM	KBS '20	✓	✗	✗
DM2L	PR '21	✗	✗	✓
LVSL	TMM '22	✓	✗	✗
iMVWL	IJCAI '18	✓	✓	✓
NAIM3L	TPAMI '22	✓	✓	✓
DICNet	AAAI '23	✓	✓	✓

Table 1: Simple information of eight comparison methods. 'Multi-view' denotes the method is designed for multi-view data; 'Missing-view' and 'Missing-label' represent their compatibility with missing views and partial labels.

Implementation Details

We set parameters as the values recommended in their codes or papers for all competitors. For our AIMNet, the batch size is 128, embedding feature d_e is 512, and learning rate is set as 1 for all five datasets. The number of head in GAT is 8 and each MLP consists of a linear layer and a activation function. To avoid randomness, we repeat experiments for all methods multiple times and report the mean and variance in the final results.



(a) IAPRTC12 (b) MIRFLICKR

Figure 2: Experimental results of ten methods on the two full datasets without any missing views or labels. The worst results are indicated at the center of radar map, while the best results are represented by the vertexes, considering six evaluation metrics.

Dataset	# Sample	# Label	# View	# Label/#Sample
Corel5k	4999	260	6	3.40
IAPRTC12	19627	291	6	5.72
ESPGame	20770	268	6	4.69
Pascal07	9963	20	6	1.47
MIRFLICKR	25000	38	6	4.72

Table 2: Detailed information about five multi-view multi-label datasets in our experiments.

Hyperparameter Analysis

In our model, there are two main hyperparameters impacting the performance, i.e., learning rate (lr) and τ. In order to obtain the optimal parameter combination that can maximizes the model performance in practice, in this section, we conduct experiments with different hyperparameters on Corel5k and Pascal7 dataset respectively. Both datasets have a 50% missing-view rate, a 50% missing-label rate, and 70% training samples. Our experimental results are presented in Fig. 1. As depicted in the figure, the optimal learning rate for our method lies in the range of [5e-1, 1e0]. Furthermore, we can find that the performance of our AIMNet is not significantly affected by the parameter τ and we set it as 0.2 in our method.