Multi-label Feature Selection with Missing Labels

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***Abstract*—With the fast development of social networks...**

***Index Terms*—feature selection, multi-label learning, missing labels.**

I. Introduction

With the explosive growth of mass media and social networks, high dimension of the feature space is becoming a bottleneck for many learning tasks [1], [2].

II. Related Work

III. Problem statement

The general model can be written as

$$J = \min_{f,\mathbf{F}_l=\mathbf{Y}_l} \sum_{i=1}^{n} loss(f(x_i), f_i) + \mu\Omega(f) \qquad (1)$$

IV. The Proposed Model

A. Motivation

B. Optimization and algorithms

C. Time complexity

D. Convergence analysis

V. Experimental analysis

A. Datasets and evaluation metrics

B. Comparison methods

C. Parameter setting

D. Feature selection results

VI. Conclusion

Here is the usage of Figure, Table and Algorithm. Fig 1 and 2.

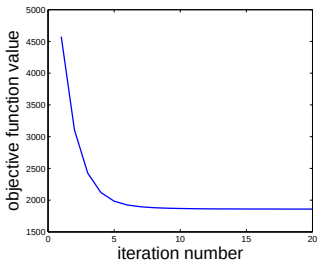
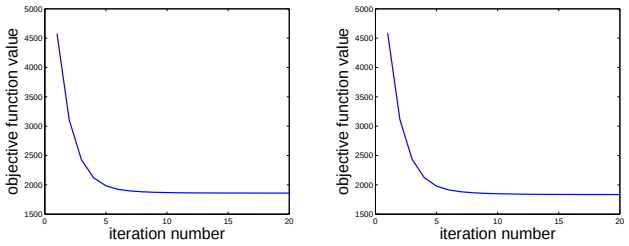


Fig. 1: Convergence curve.

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Algorithm 1 MLMLFS

Input:
Training data $\mathbf{X} \in \mathbb{R}^{n\times d}$
Set $t = 0$ and initialize $\mathbf{W_0} \in \mathbb{R}^{d\times c}$;
repeat
  Compute $\mathbf{W}^{t+1}$;
until Convergence criterion satisfied.
Output:
Feature selection matrix $\mathbf{W} \in \mathbb{R}^{d\times c}$



(a) $p = 0.4$ (b) $p = 0.6$

Fig. 2: Convergence curve.

TABLE I: Datasets

Dataset	Sample	Feature	Class	Train	Test	Domain
Artificial	5000	462	26	2000	3000	Text
Birds	645	260	19	322	323	Audio

TABLE II: Evaluations

(a) *Hamming Loss*

Data	MDDM	PMU	SFUS	MDMR
Artificial	0.0620	**0.0603**	0.0605	0.0587
Birds	0.0620	0.0603	0.0605	0.0587

(b) *Ranking Loss*

Data	MDDM	PMU	SFUS	MDMR
Artificial	0.1536	0.1554	**0.1480**	**0.1480**
Birds	0.0620	0.0603	0.0605	0.0587

References

[1] I. Guyon and A. Elisseeff, "An introduction to variable and feature selection," *Journal of Machine Learning Research*, vol. 3, no. 6, pp. 1157–1182, 2002.
[2] A. K. Mccallum, "Multi-label text classification with a mixture model trained by em," 1999.