Multi-task MIML learning for pre-course student performance prediction

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Problems & Ideas

- Problems of pre-course student performance prediction
  - Students cannot be simply represented in a common feature space.
  - Multiple target courses should be considered as a whole.
  - There lacks large-scale public datasets for pre-course.
- Ideas: Multi-task MIML learning method
  - Cast it as a Multi-Instance Multi-Label learning (MIML) problem.
  - Propose a novel multi-task learning method for MIML scenes.

Fig. 1 The flow diagram of MIML-Circle

Main Contributions

MIML-Circle outperforms the other competitors. Some experimental results are given below.

- **Performance of different algorithms on Term2**

Table 3 Performance of different algorithms on Term2

Methods	*ave_Acc*	*macro_Rec*	*macro_Prec*	*macro_F*$_{1.5}$
SVM	0.7750	0.3654	0.3805	0.3700
MIMLSVM	0.7744	0.5004	0.4653	0.4890
SISL-Circle	0.7363	0.2323	0.2792	0.2449
The method in [17]	0.7177	0.5243	0.3420	0.4504
MIML-Circle	**0.8254**	**0.5893**	**0.5637**	**0.5811**

- **Performance of different algorithms on Term3**

Table 4 Performance of different algorithms on Term3

Methods	*ave_Acc*	*macro_Rec*	*macro_Prec*	*macro_F*$_{1.5}$
SVM	0.7807	0.3347	0.4802	0.3691
MIMLSVM	0.7676	0.4671	0.4358	0.4570
SISL-Circle	0.6817	0.5355	0.3259	0.4470
The method in [17]	0.7109	0.5200	0.3534	0.4541
MIML-Circle	**0.8297**	**0.6454**	**0.5836**	**0.6251**