

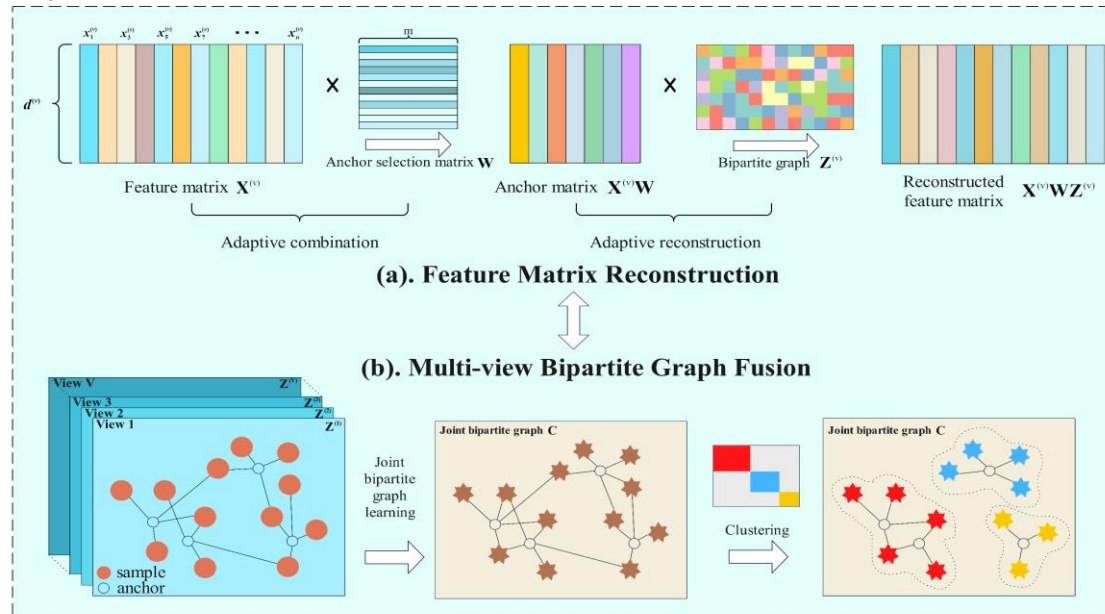
Structure Sparsity-Induced Bipartite Graph Learning for Multi-View Clustering

Yuxin HUO, Hongyu JIANG, Hong TAO, Chenping HOU

Frontiers of Computer Science, DOI: [10.1007/s11704-025-50224-3](https://doi.org/10.1007/s11704-025-50224-3)

Problems & Ideas

- Problems of bipartite graph-based multi-view clustering methods:
 - Predefined bipartite graphs with fixed anchors may not reflect the underlying clustering structure accurately, degrading clustering performance.
 - Existing multi-view clustering methods based on bipartite graph with adaptive anchors tend to suffer from reconstruction and initialization flaws.
- Ideas: A structure sparsity-induced bipartite graph learning method that dynamically constructs view-specific bipartite graphs with automatically learned anchors.



Description of joint structural optimization bipartite graph clustering based on adaptive anchor construction. Stars of different colors represent anchors of different categories, and solid lines indicate the correlation between anchors and samples.

Main Contributions

- Contributions:
 - Different from existing anchor learning strategies, representative anchors are constructed by active selection and adaptive combination of key samples, which eliminates the noise introduction issue;
 - View-specific bipartite graphs are jointly learned by minimizing the reconstruction error within the self-representation-based subspace clustering framework, which has enhanced representation capacity of the underlying clustering structure;
 - A comprehensive bipartite graph with each connected component corresponding to a cluster is obtained. Experimental results verify the advantages of the proposed method over state-of-the-art methods.

Datasets	BMVC	SFMC	FMVACC	CMKOA	IWTSN-FMGC	SSBG
	ACC					
AR10P	0.3000	0.2692	0.2903	0.3000	<u>0.2923</u>	0.3000
MSRC_v1	<u>0.7714</u>	0.7333	0.3800	0.7286	0.5905	0.8143
NH	0.7418	0.8091	0.3459	<u>0.8109</u>	0.6091	0.9509
ImageSeg	0.3177	<u>0.3221</u>	0.2846	0.2706	0.3169	0.4515
Caltech101-7	0.5380	<u>0.6493</u>	0.4351	0.4830	0.4668	0.6723
KSA	0.2559	0.2511	<u>0.3380</u>	0.2567	0.2005	0.3501

The ACC of the compared multi-view clustering methods. The best result is highlighted in boldface. Underlines mean the second-best competitors.