

On the Suitability of Connectivity-Extended Local Embedding for Drawing Multivariate Graphs: An Evaluation - Appendix

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Appendix A

Graph Visualizations

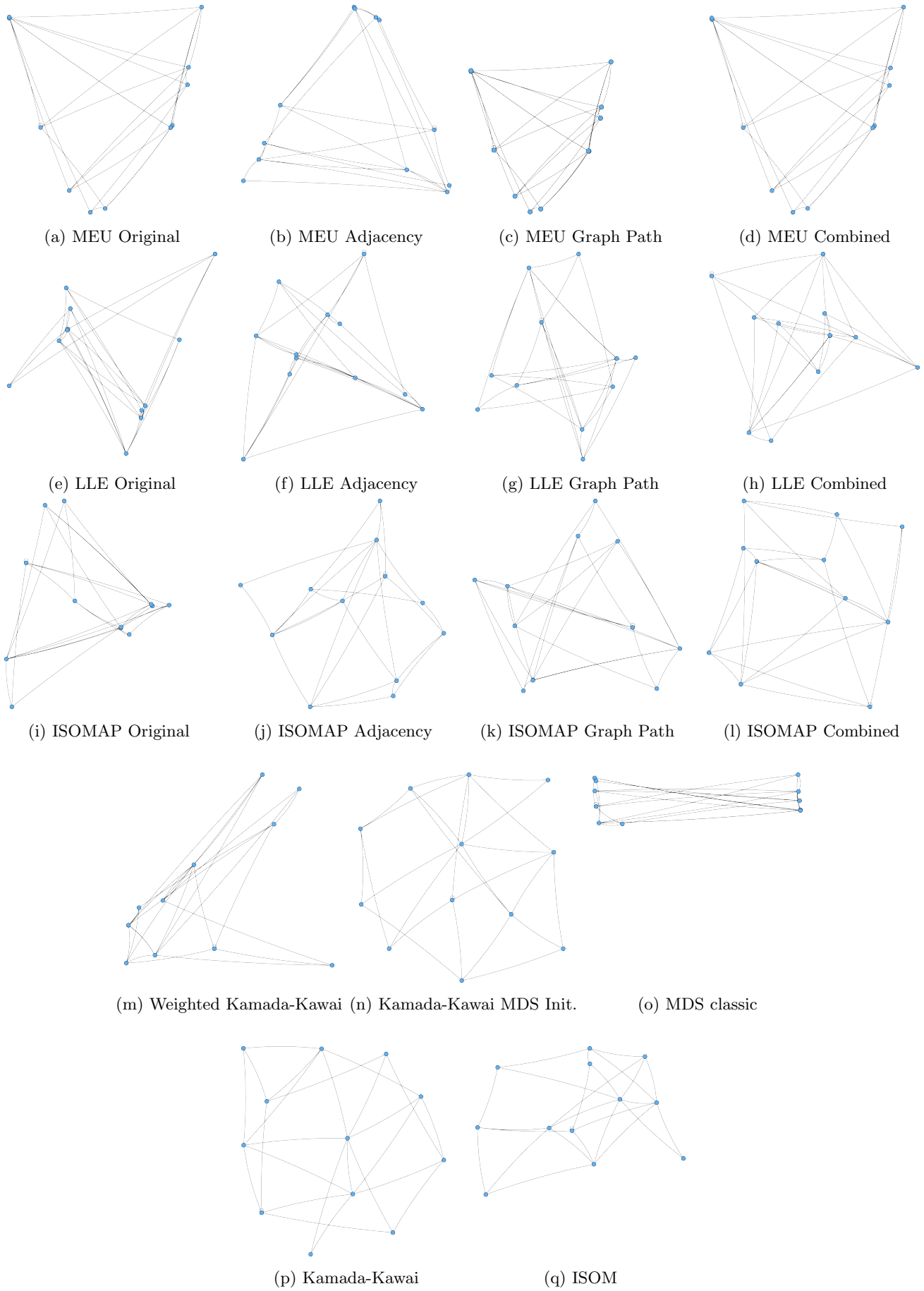


Figure A.1: Renderings of the exitRegulation dataset

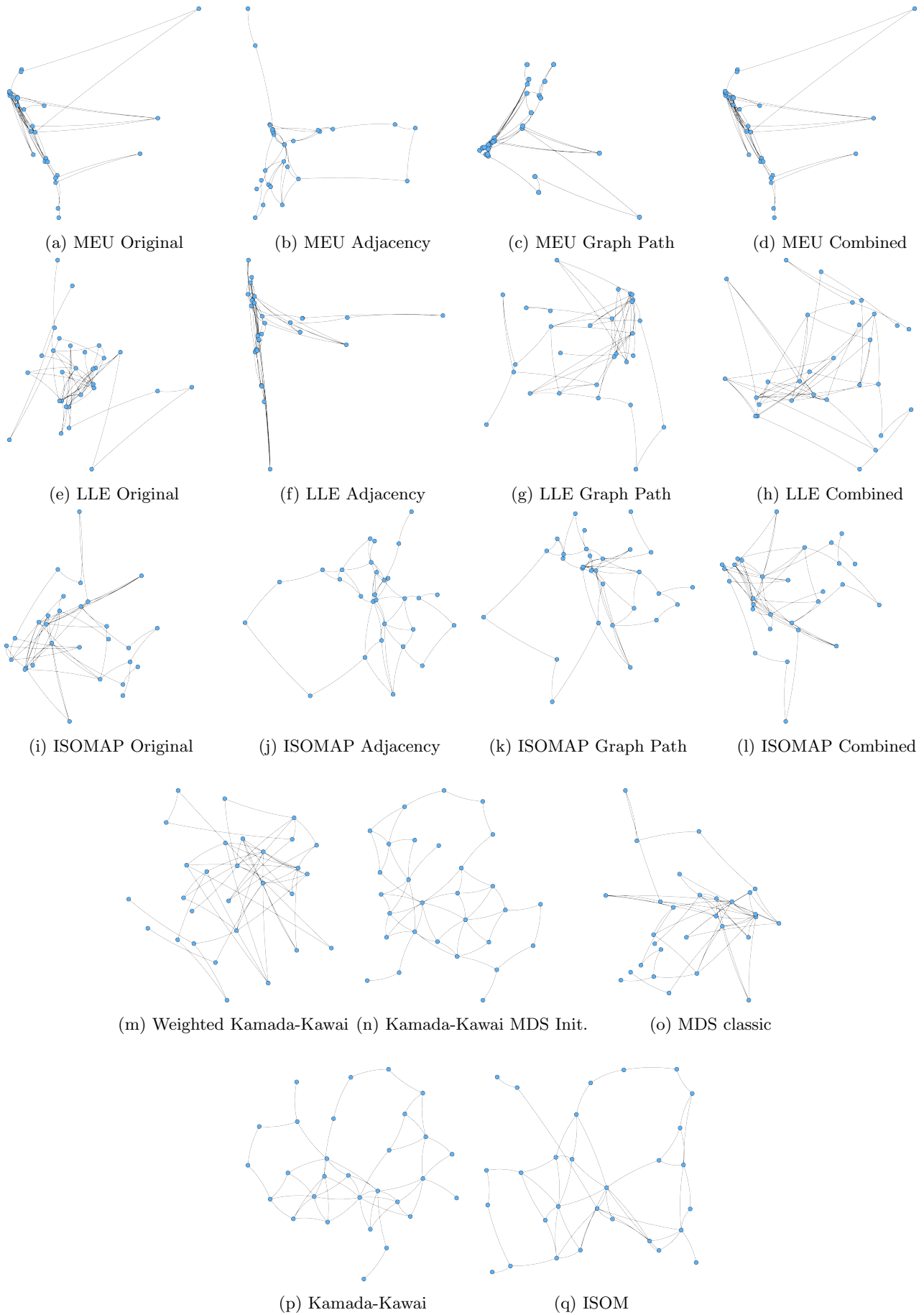


Figure A.2: Renderings of the exitHouseholds dataset

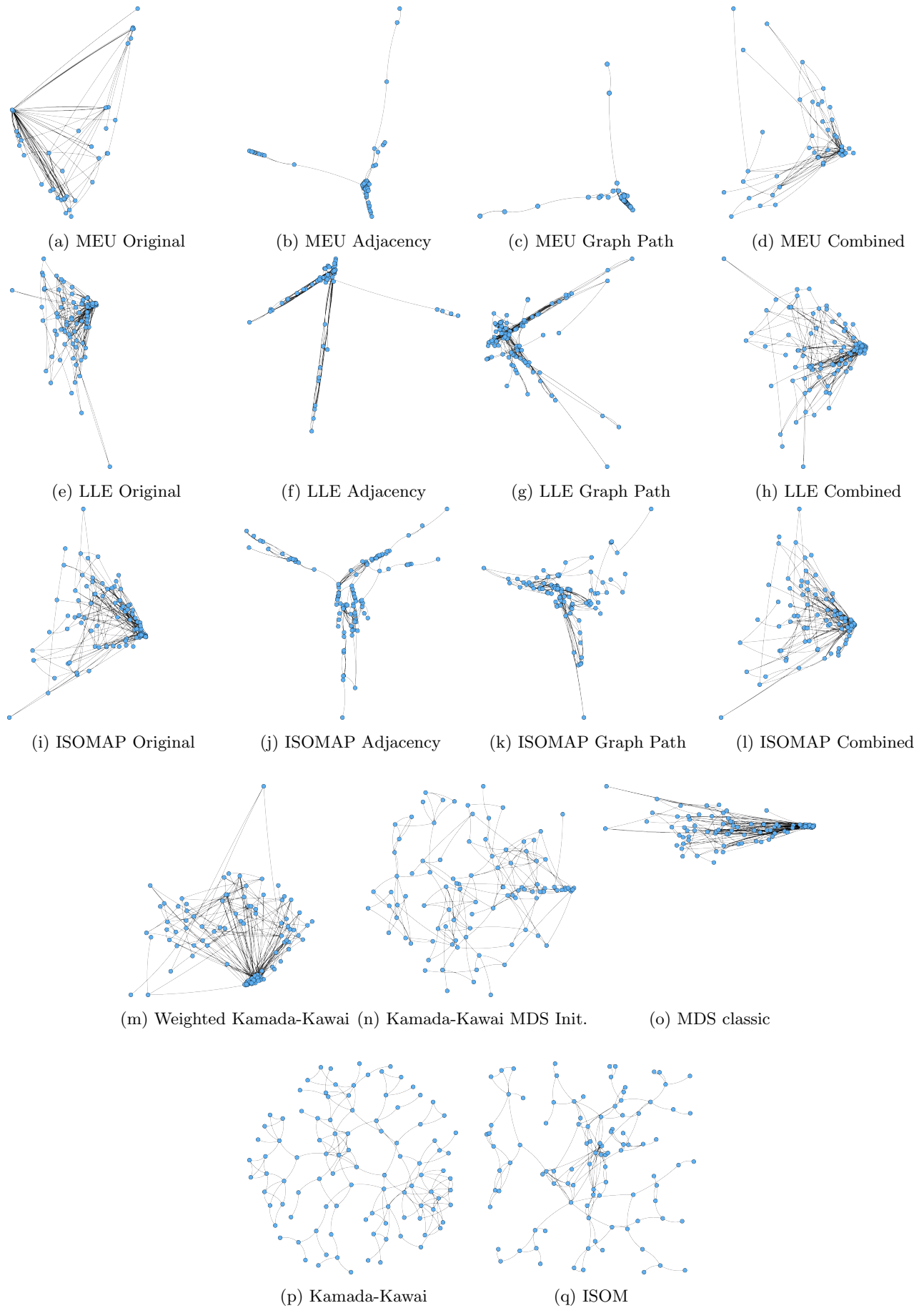


Figure A.3: Renderings of the exitDocuments dataset

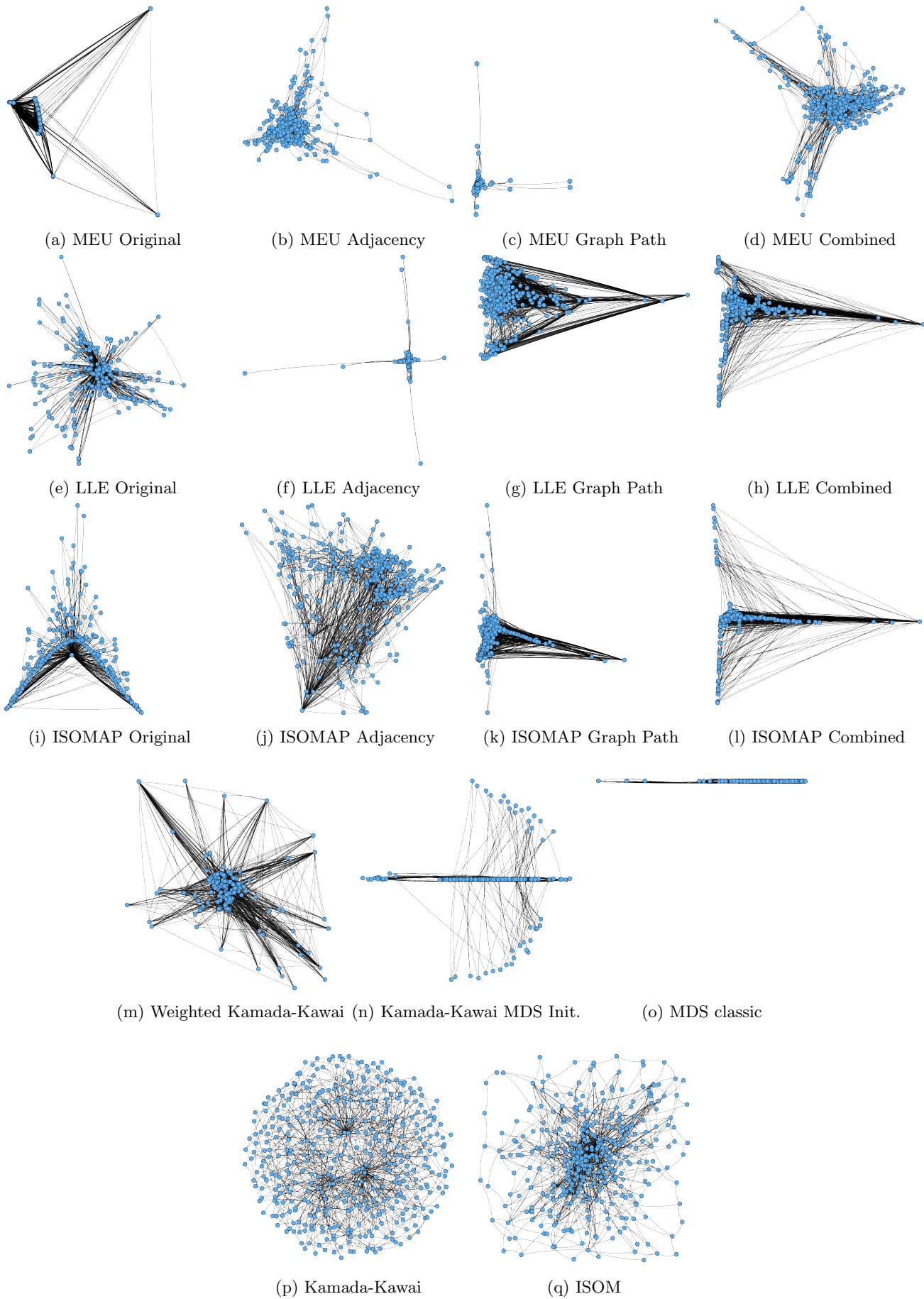


Figure A.4: Renderings of the extitPhone Calls dataset

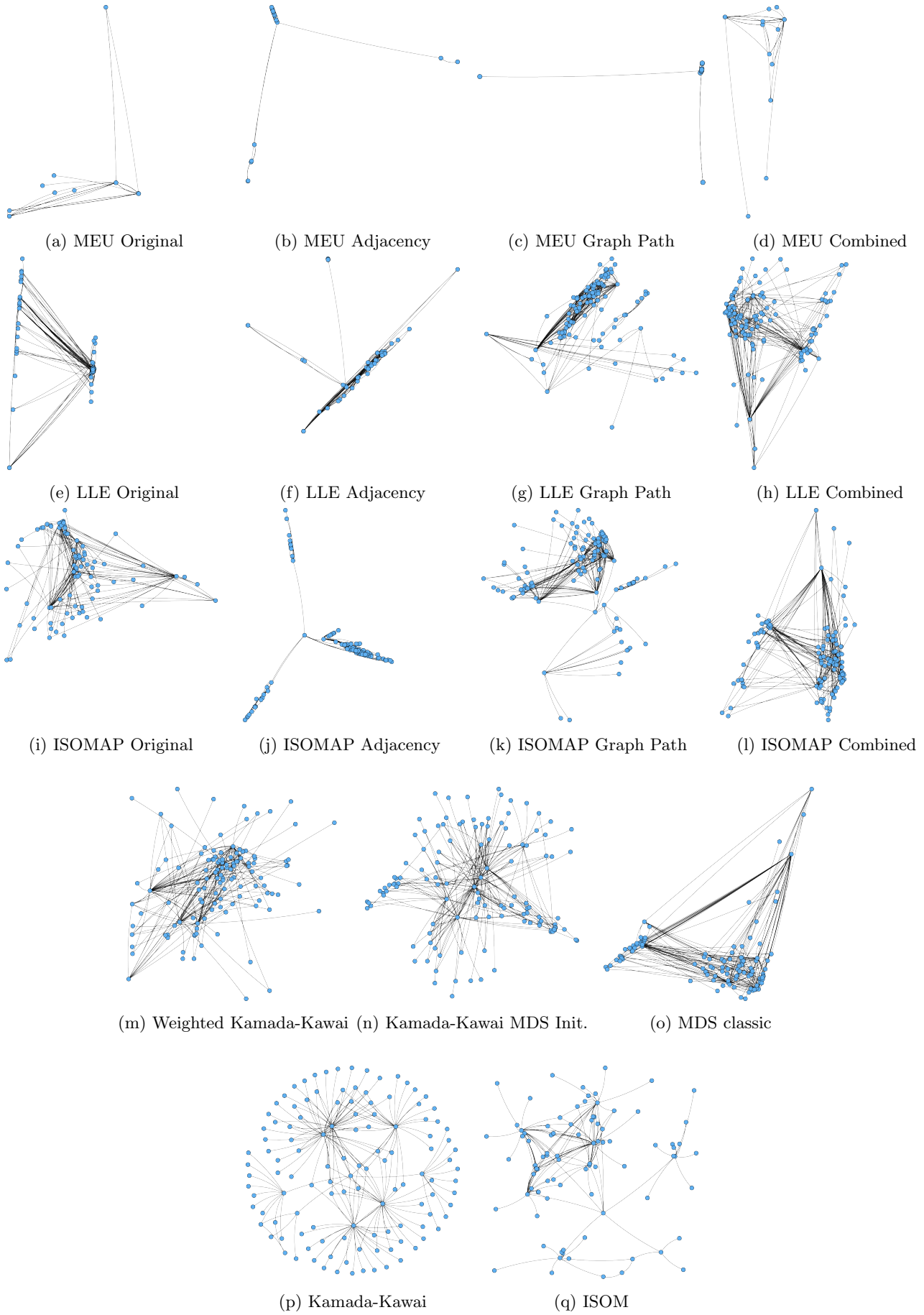


Figure A.5: Renderings of the exitAmazon dataset

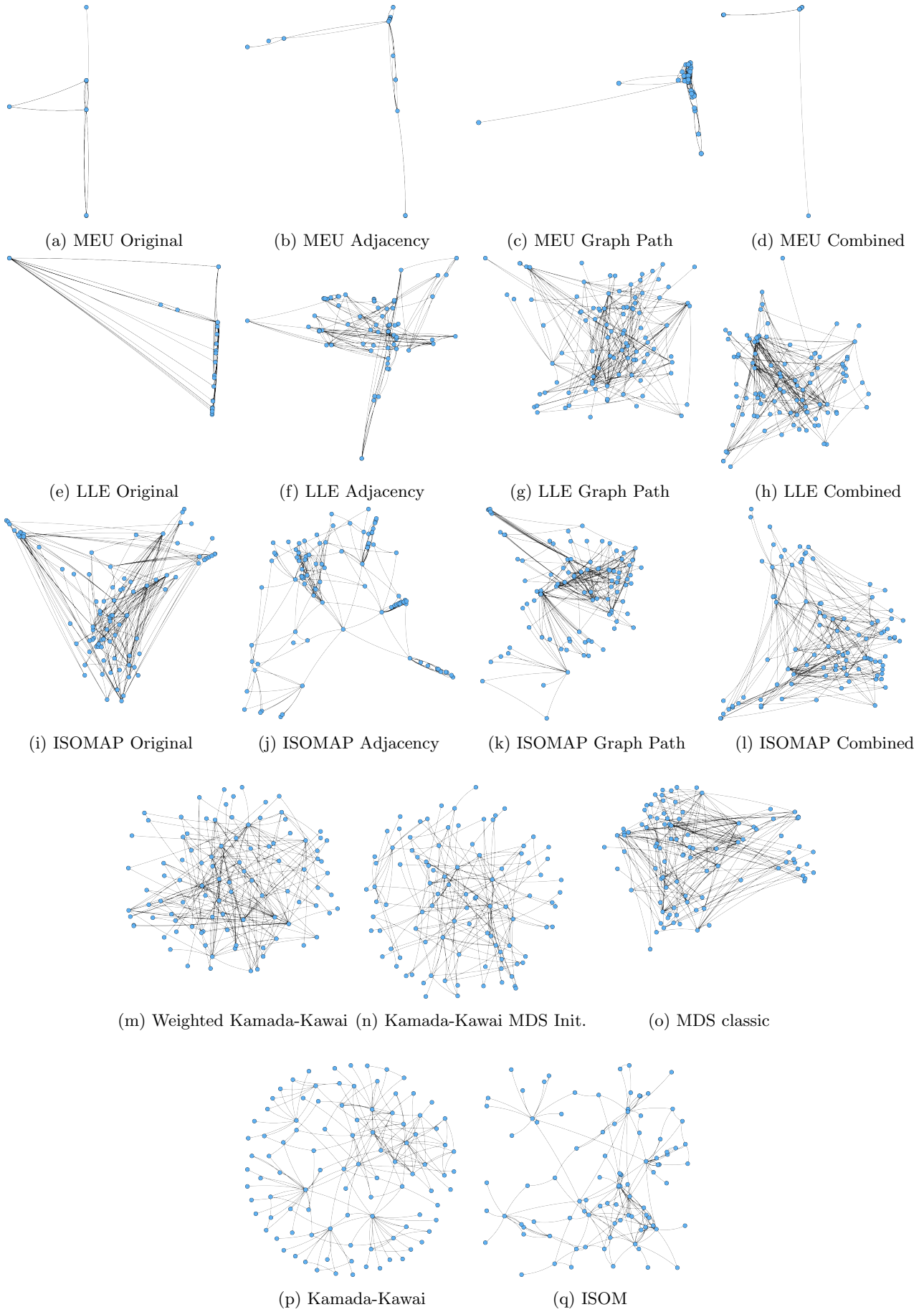


Figure A.6: Renderings of the extitPatents dataset

Appendix B

Quantitative Results

B.1 Graph Aesthetics: Edge Crossings

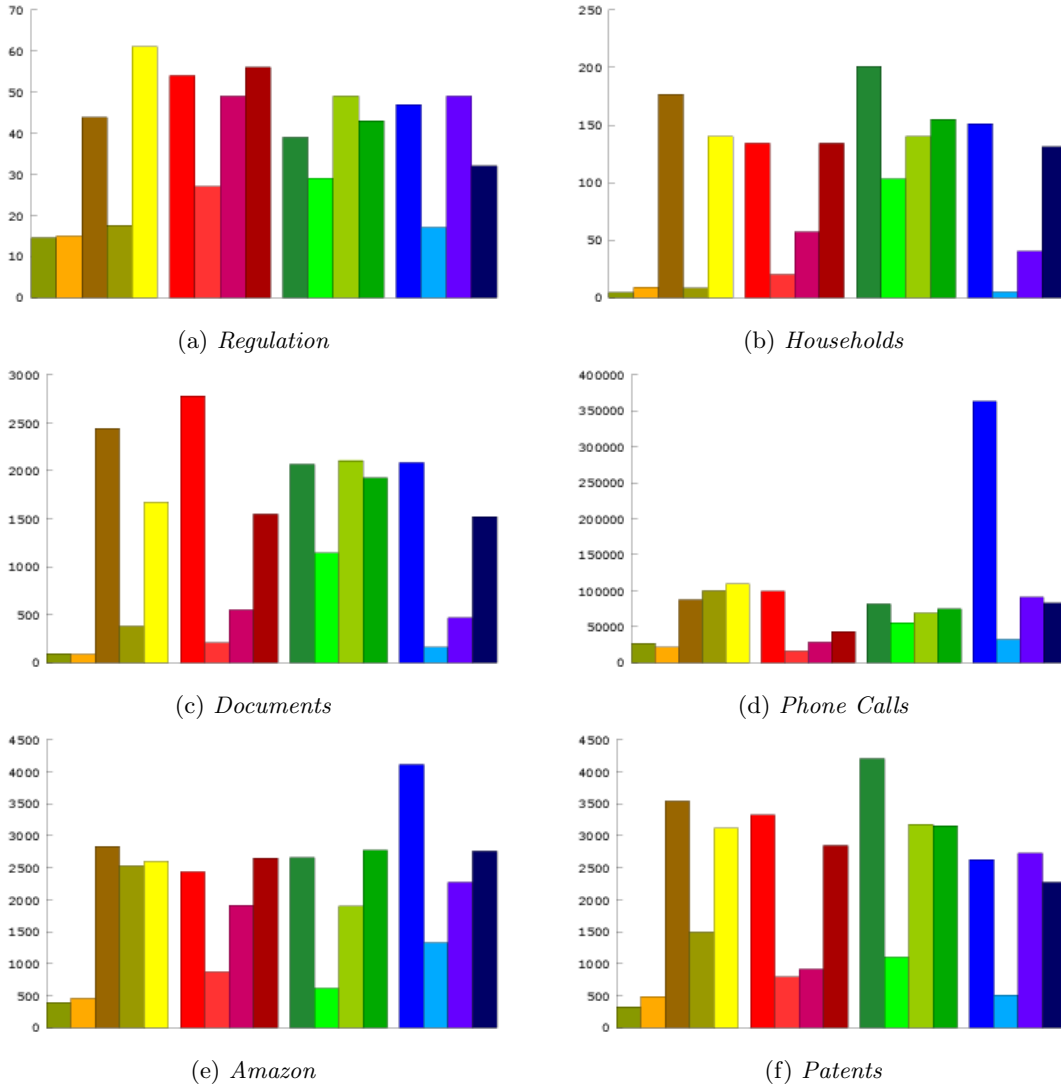


Figure B.1: Edge Crossings

	ISOM		Kamada-Kawai		MDS classic		MEU Graph Path		MEU Combined
	Weighted KK		KK MDS Init.		MEU Original		MEU Adjacency		LLE Original
	LLE Original		LLE Adjacency		LLE Graph Path		LLE Combined		ISOMAP Original
	ISOMAP Original		ISOMAP Adjacency		ISOMAP Graph Path		ISOMAP Combined		

B.2 Graph Aesthetics: Even Edge Distribution

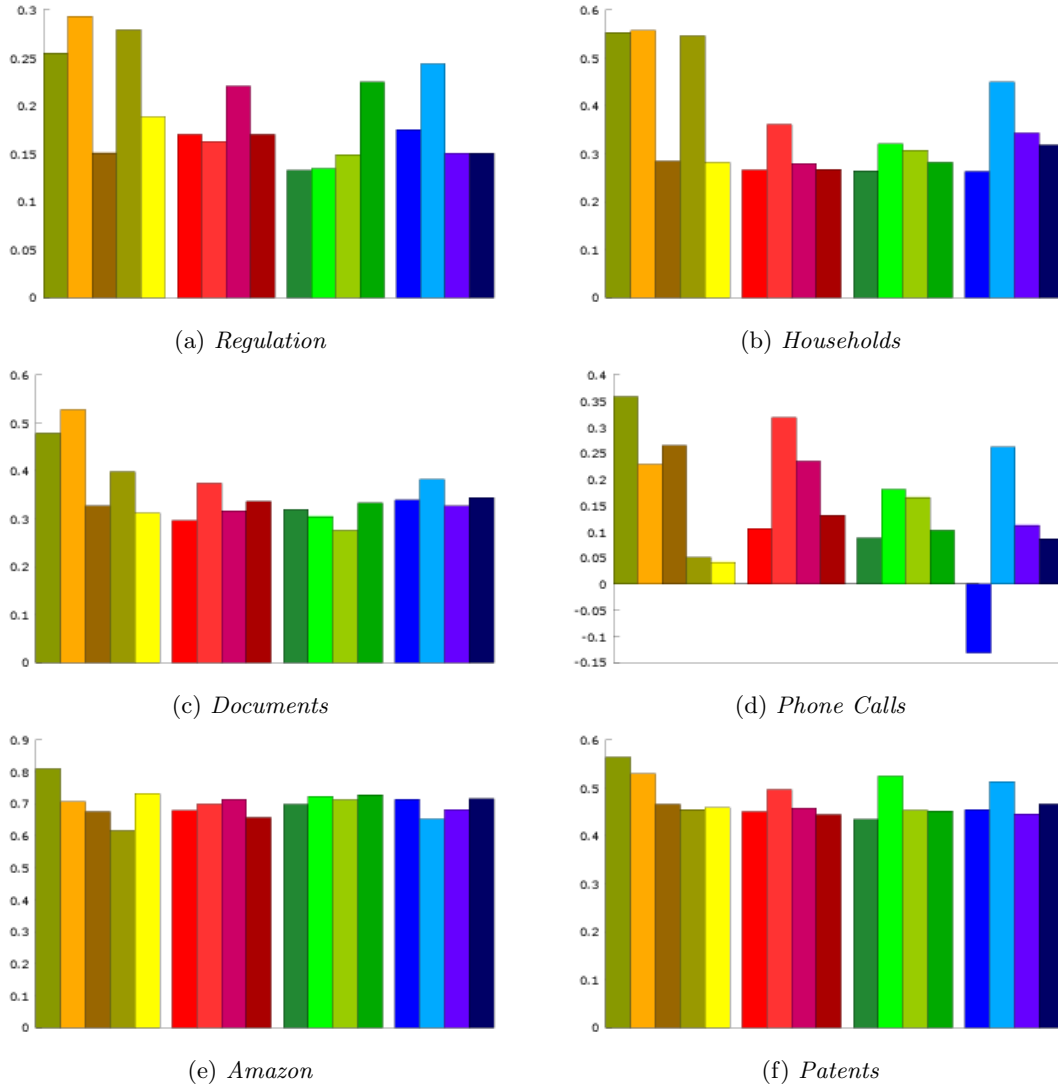
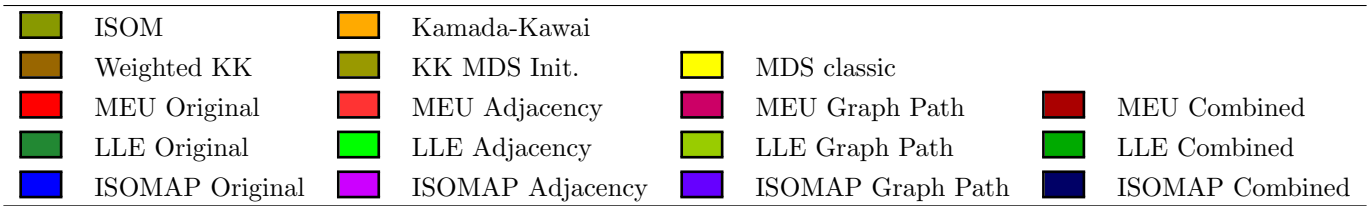


Figure B.2: Even Edge Distribution



B.3 Graph Aesthetics: Layout Energy

B.3.1 Global Layout Energy

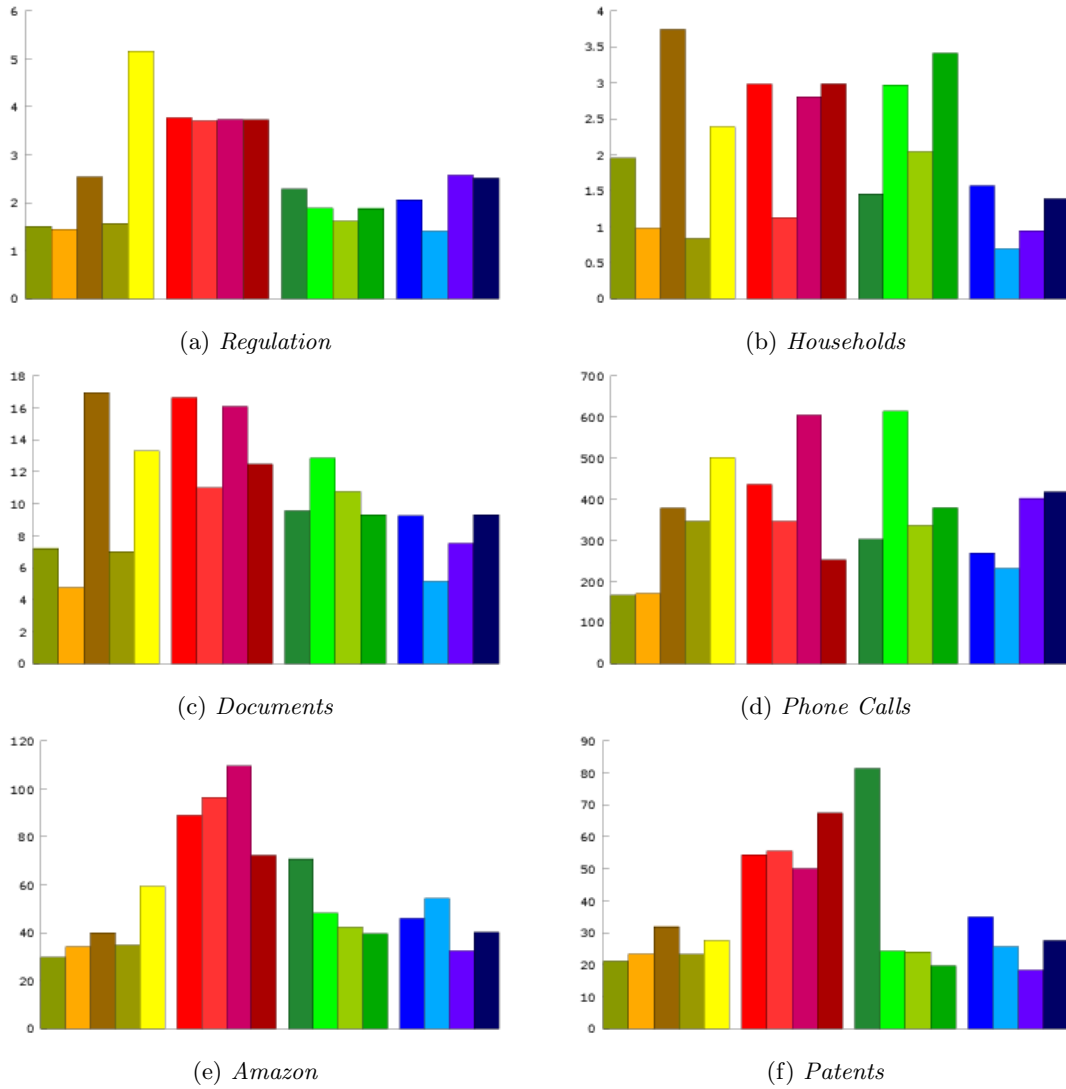
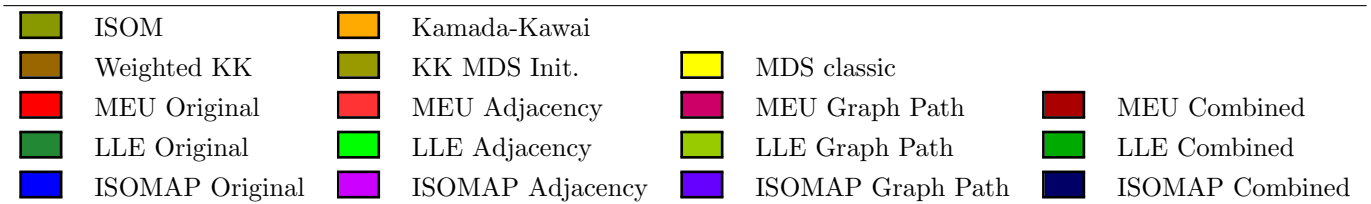


Figure B.3: Global Layout Energy



B.3.2 Local Layout Energy Variance

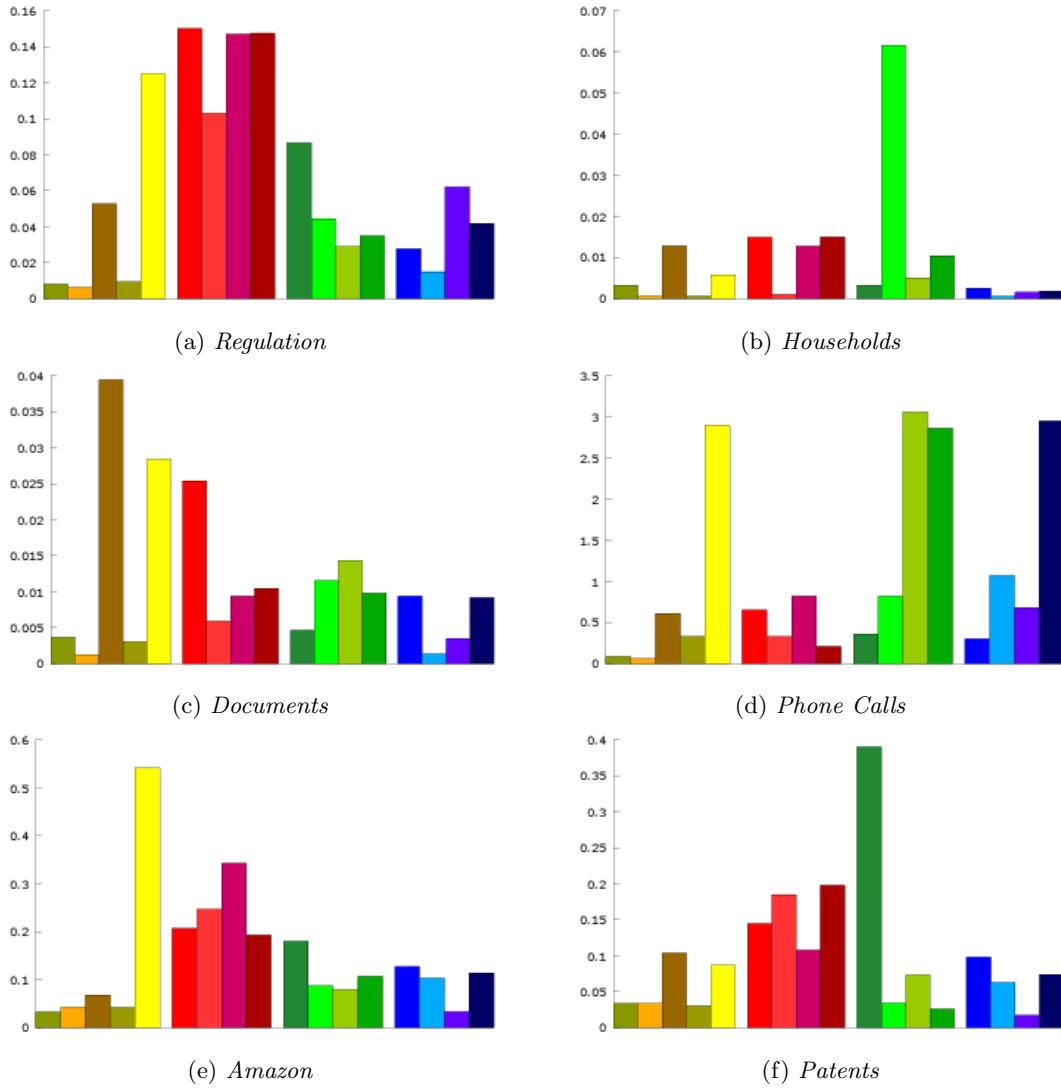


Figure B.4: Local Layout Energy Variance



B.4 Similarity Representation: General Distance Preservation

B.4.1 General Distance Preservation: Regulation Dataset

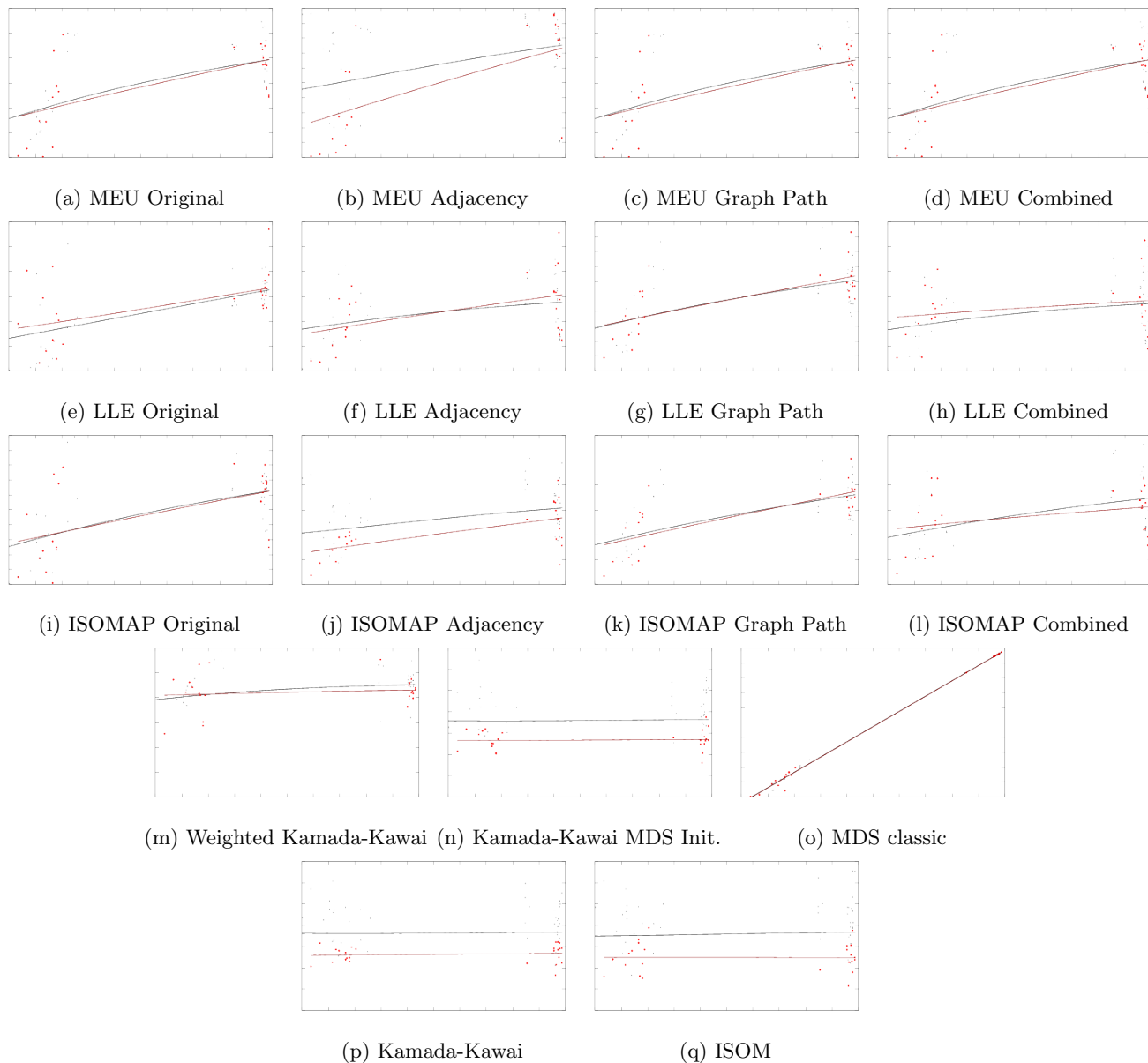


Figure B.5: *Regulation* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.4.2 General Distance Preservation: Households Dataset

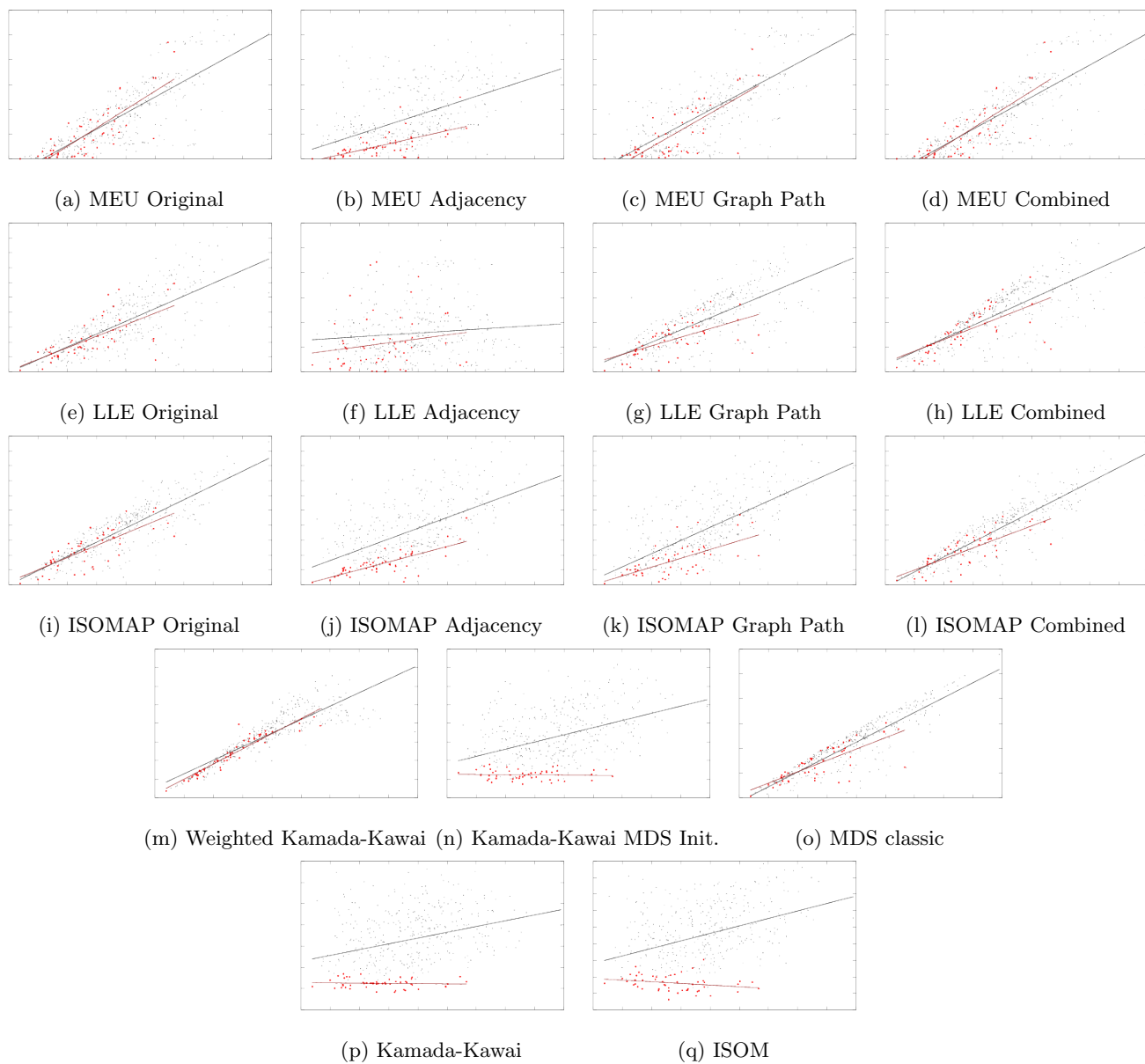


Figure B.6: *Households* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.4.3 General Distance Preservation: Documents Dataset

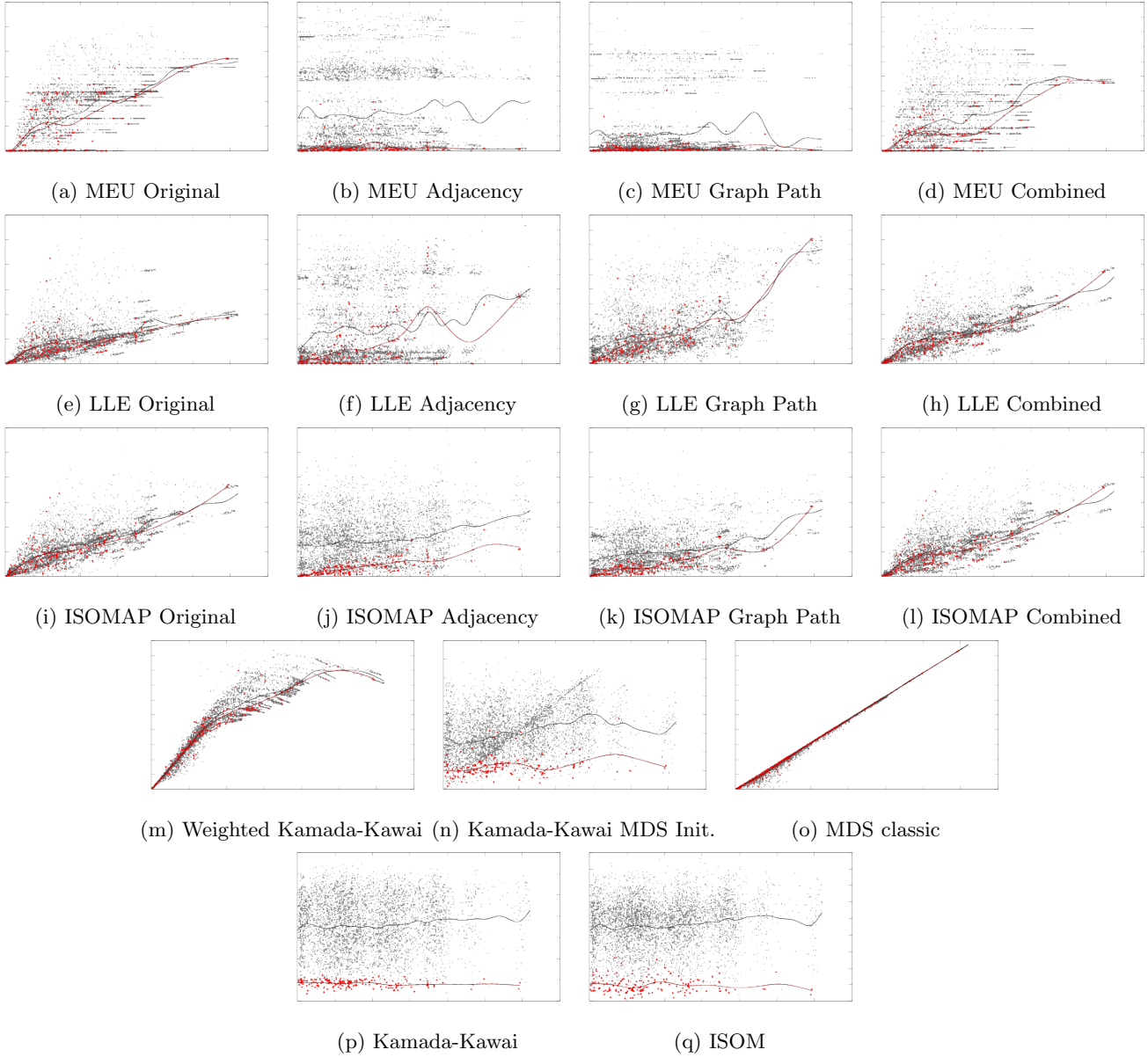


Figure B.7: *Documents* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.4.4 General Distance Preservation: Phone Calls Dataset

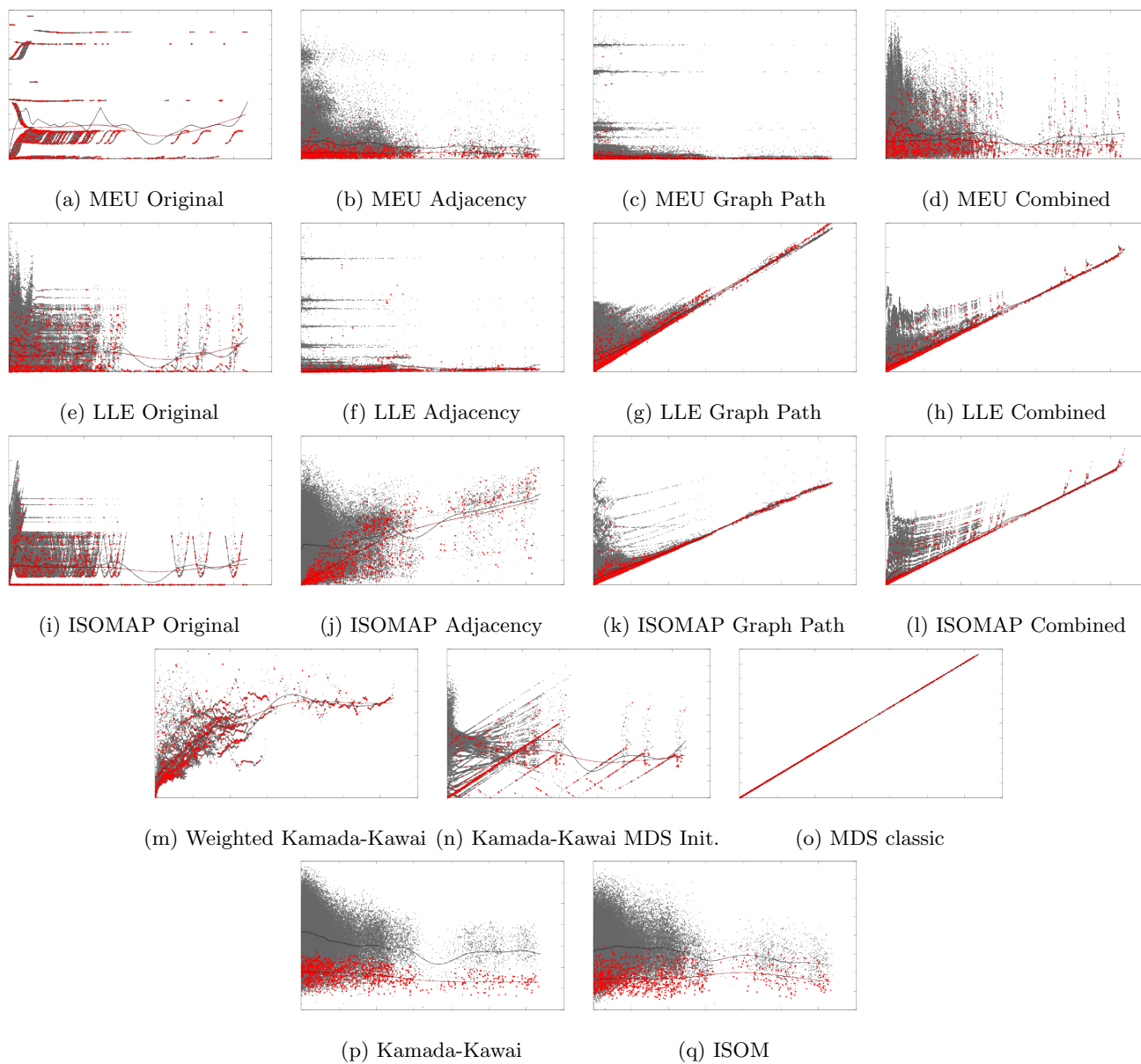


Figure B.8: *Phone Calls* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.4.5 General Distance Preservation: Amazon Dataset

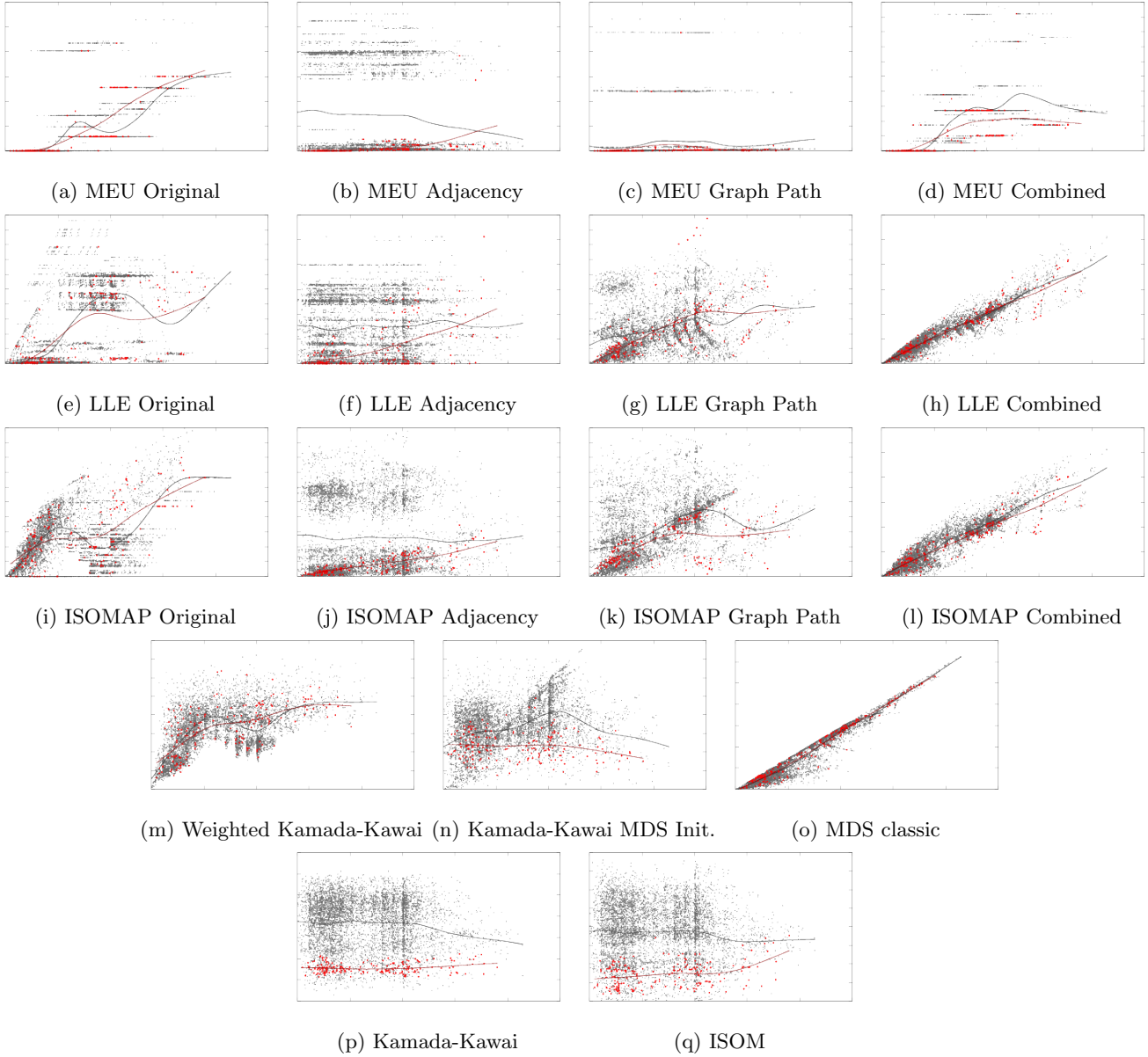


Figure B.9: *Amazon* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.4.6 General Distance Preservation: Patents Dataset

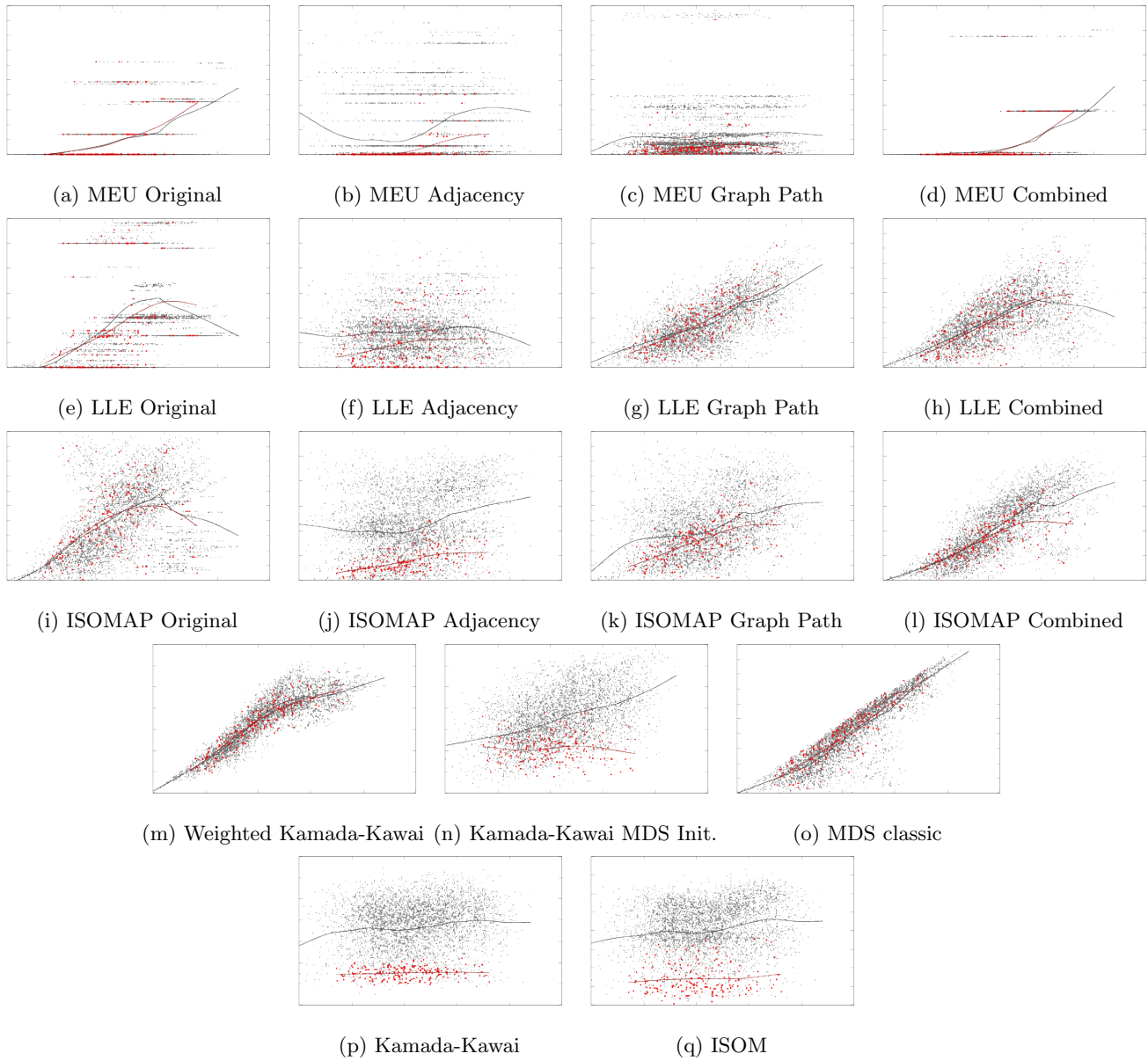


Figure B.10: *Patents* dataset: node similarity preservation. X axis: attribute space distance, Y axis: layout space distance. Red dots: adjacent vertices, gray dots: all vertex pairs. Red and gray lines are smooth interpolations.

B.5 Graph Aesthetics versus Projection Quality

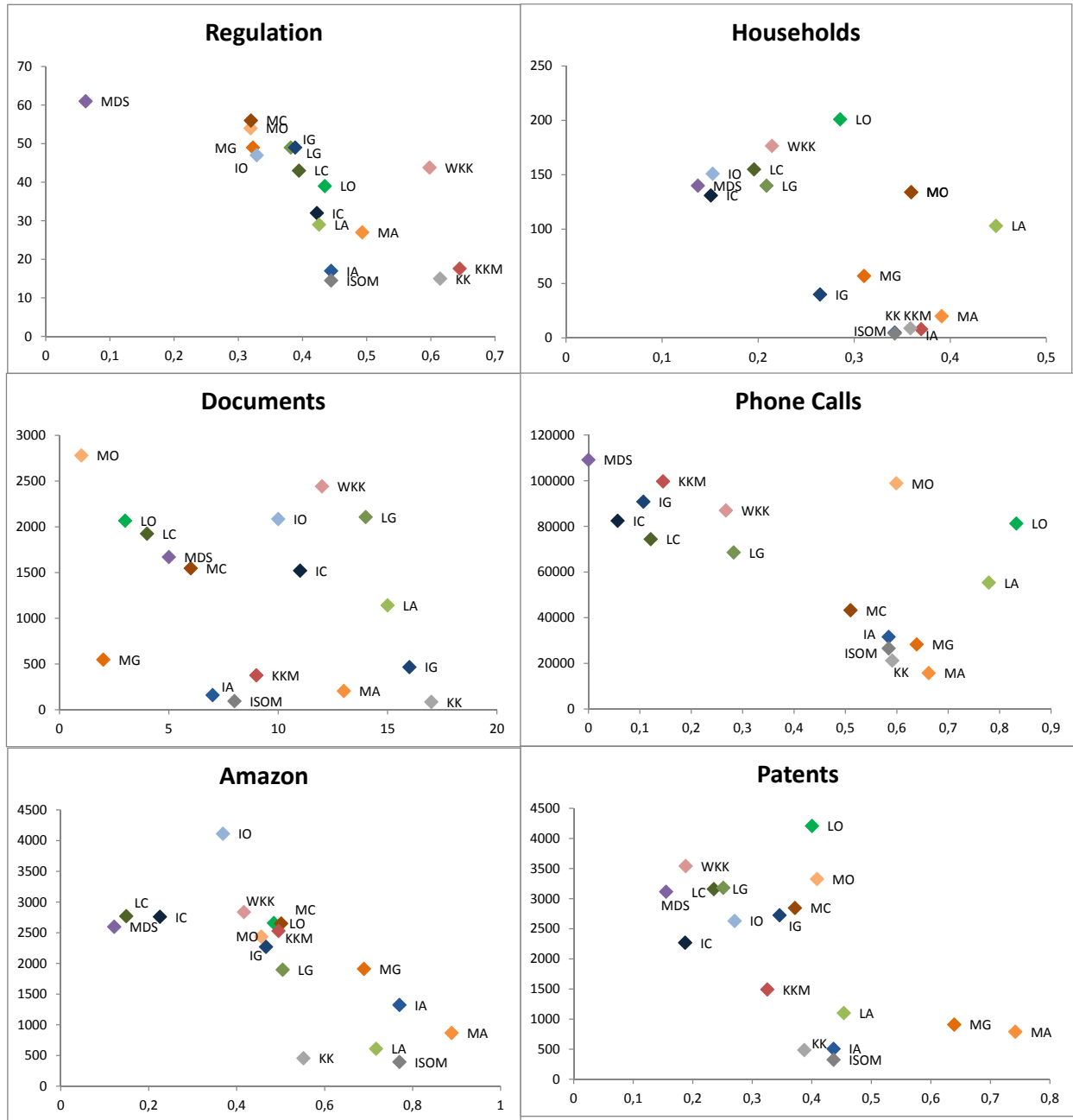
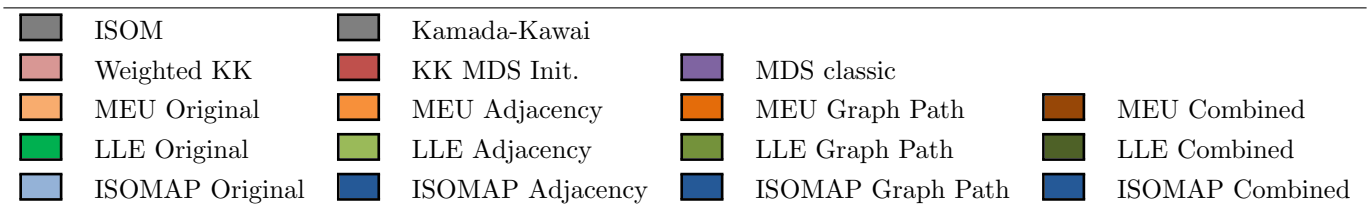


Figure B.11: Edge Crossing versus Projection Precision



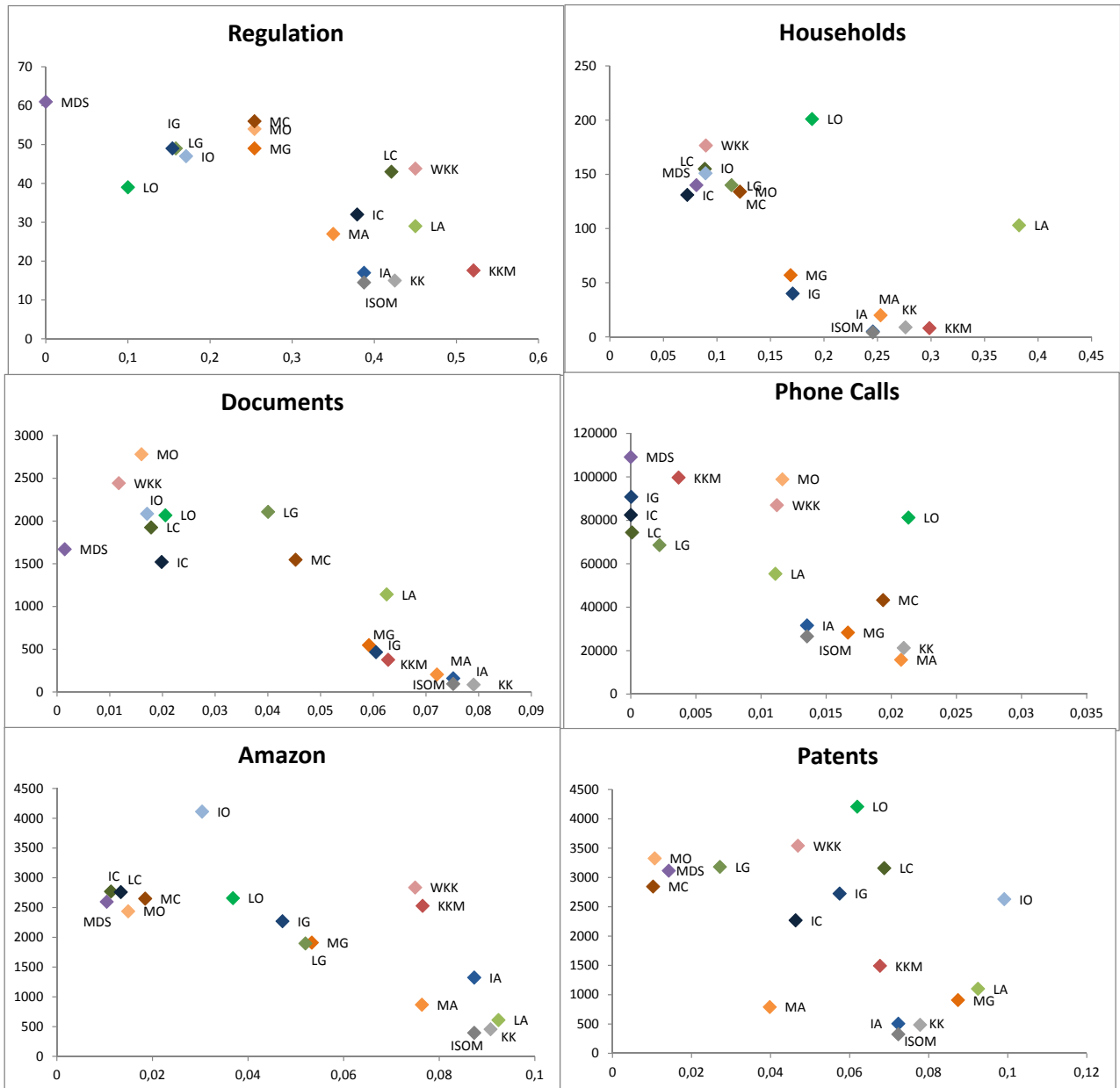
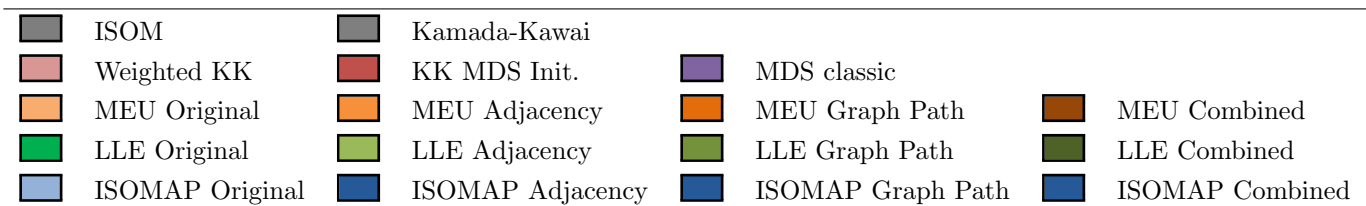


Figure B.12: Edge Crossing versus Mean relative rank errors



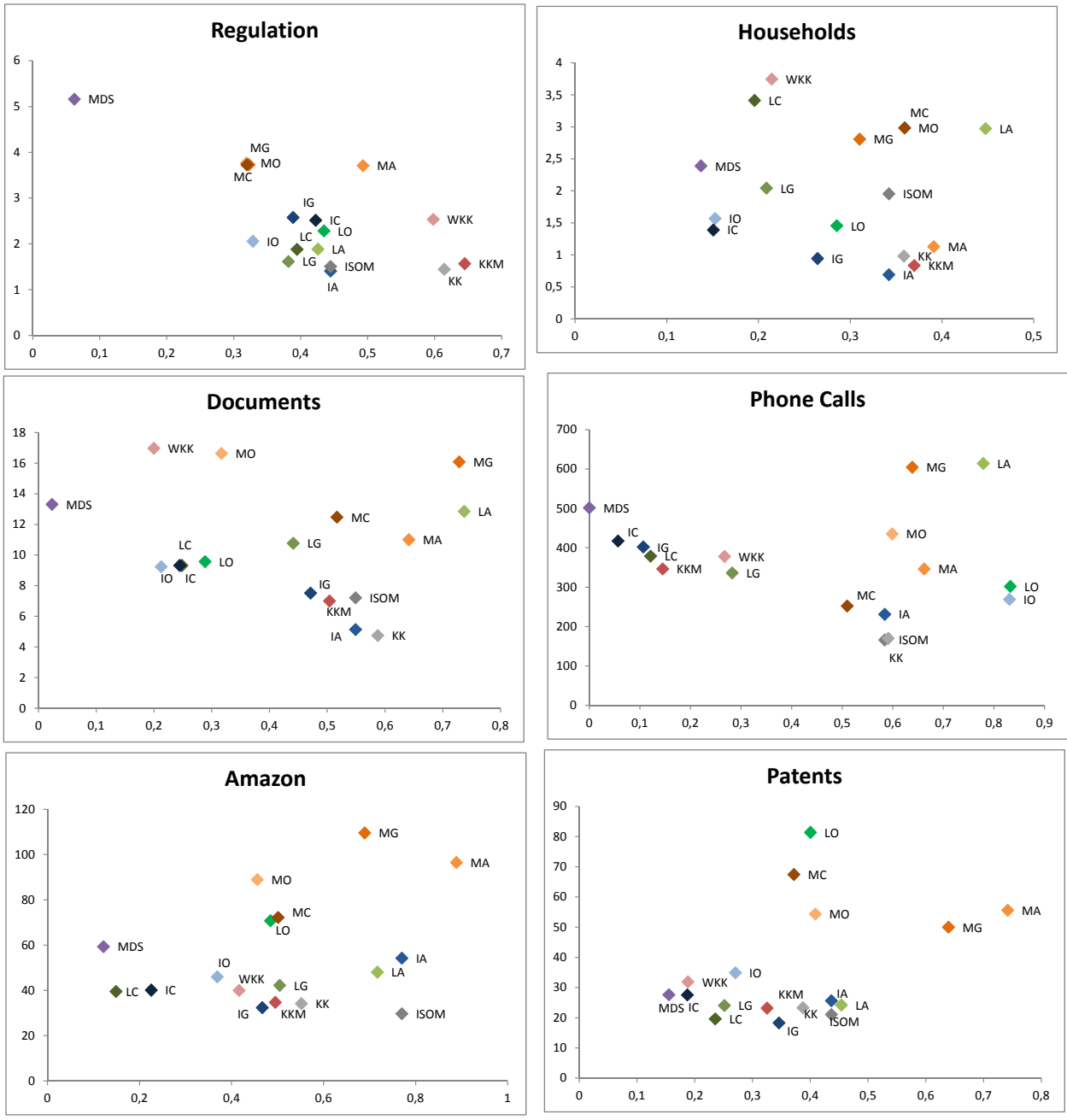


Figure B.13: Layout Energy versus Projection precision

	ISOM		Kamada-Kawai		MDS classic
	Weighted KK		KK MDS Init.		MEU Original
	LLE Original		LLE Adjacency		MEU Graph Path
	ISOMAP Original		ISOMAP Adjacency		MEU Combined
			ISOMAP Graph Path		LLE Combined
			ISOMAP Combined		

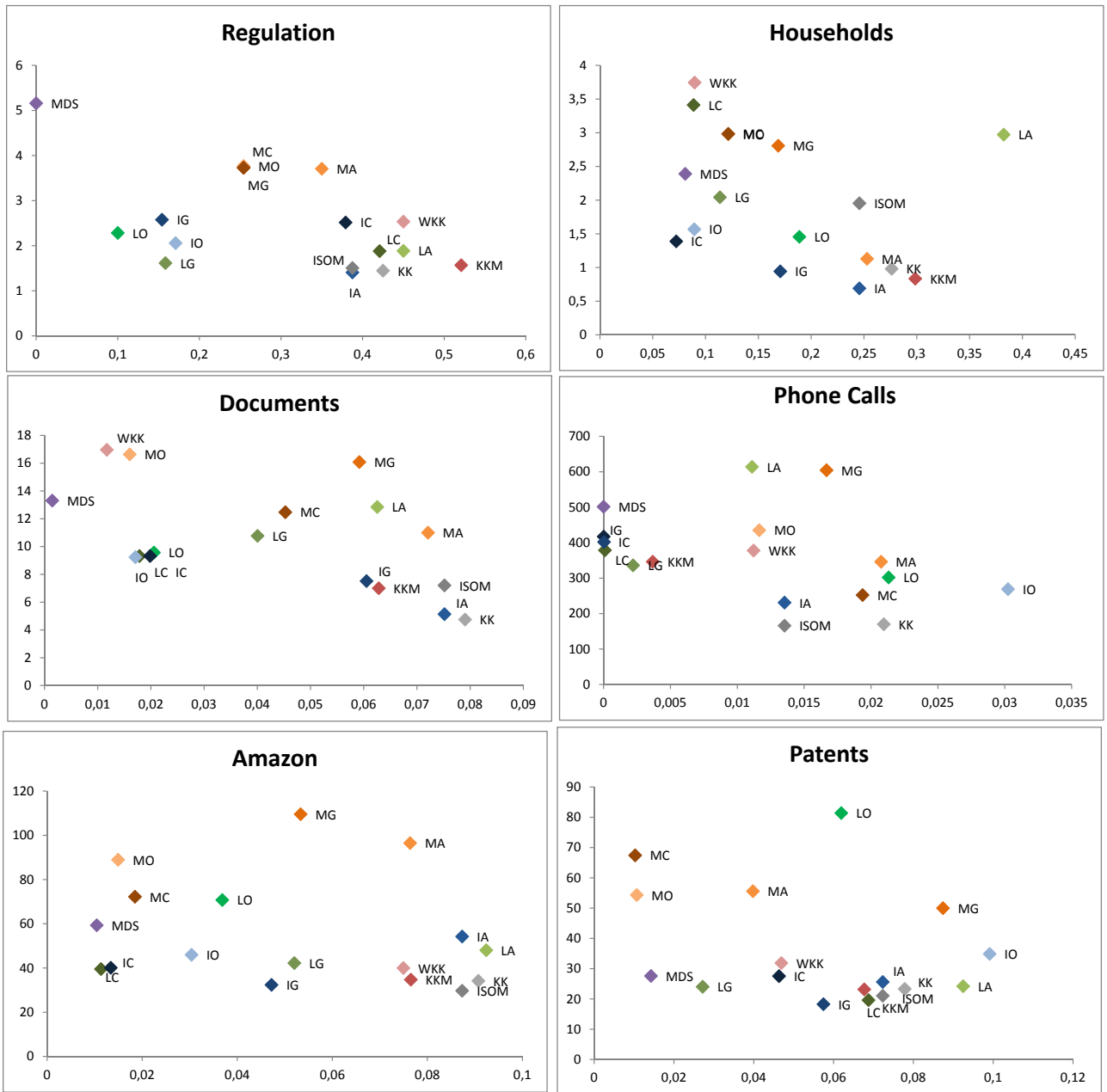
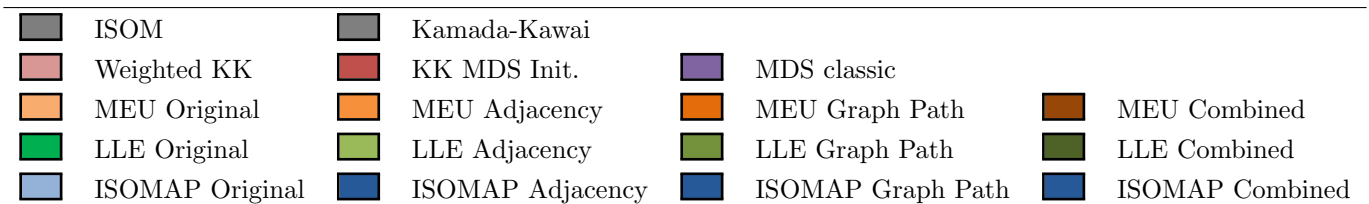


Figure B.14: Layout Energy versus Mean relative rank errors



Appendix C

Impact of Varying Neighborhood Sizes

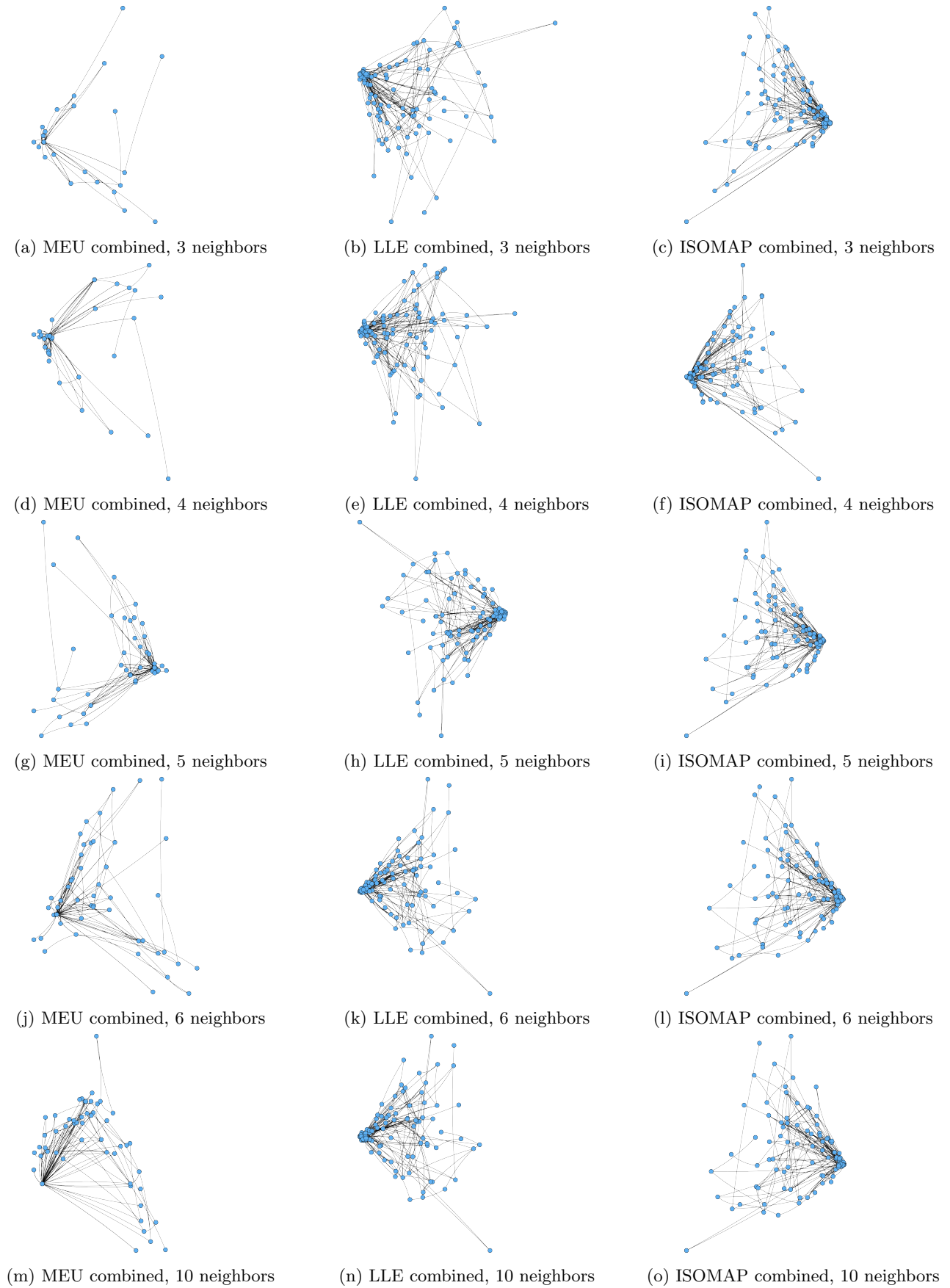


Figure C.1: Renderings of the *Documents* dataset (combined)

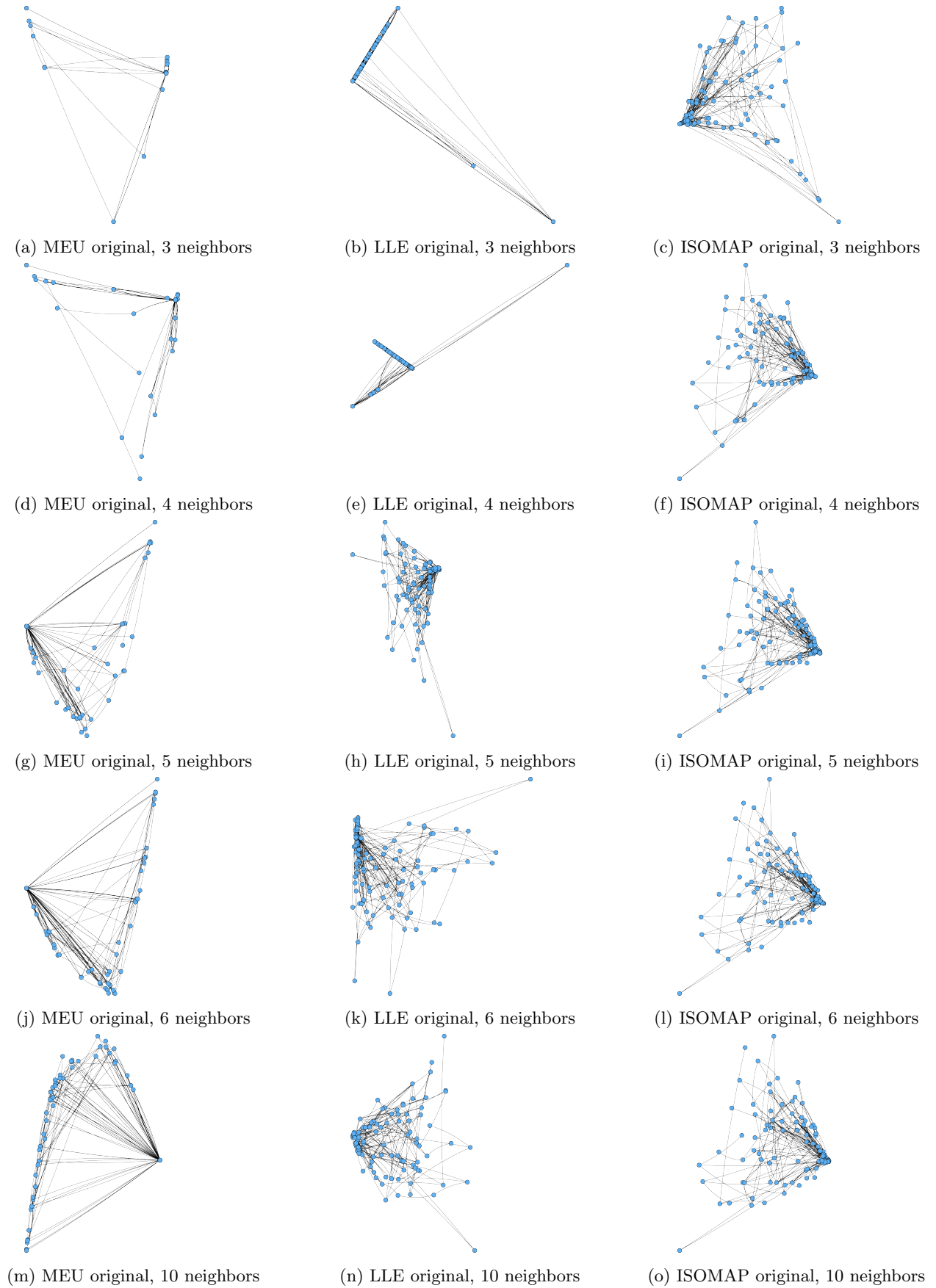


Figure C.2: Renderings of the *Documents* dataset (original)

Appendix D

Interactive Exploration of Graph Connectivity and Node Similarity

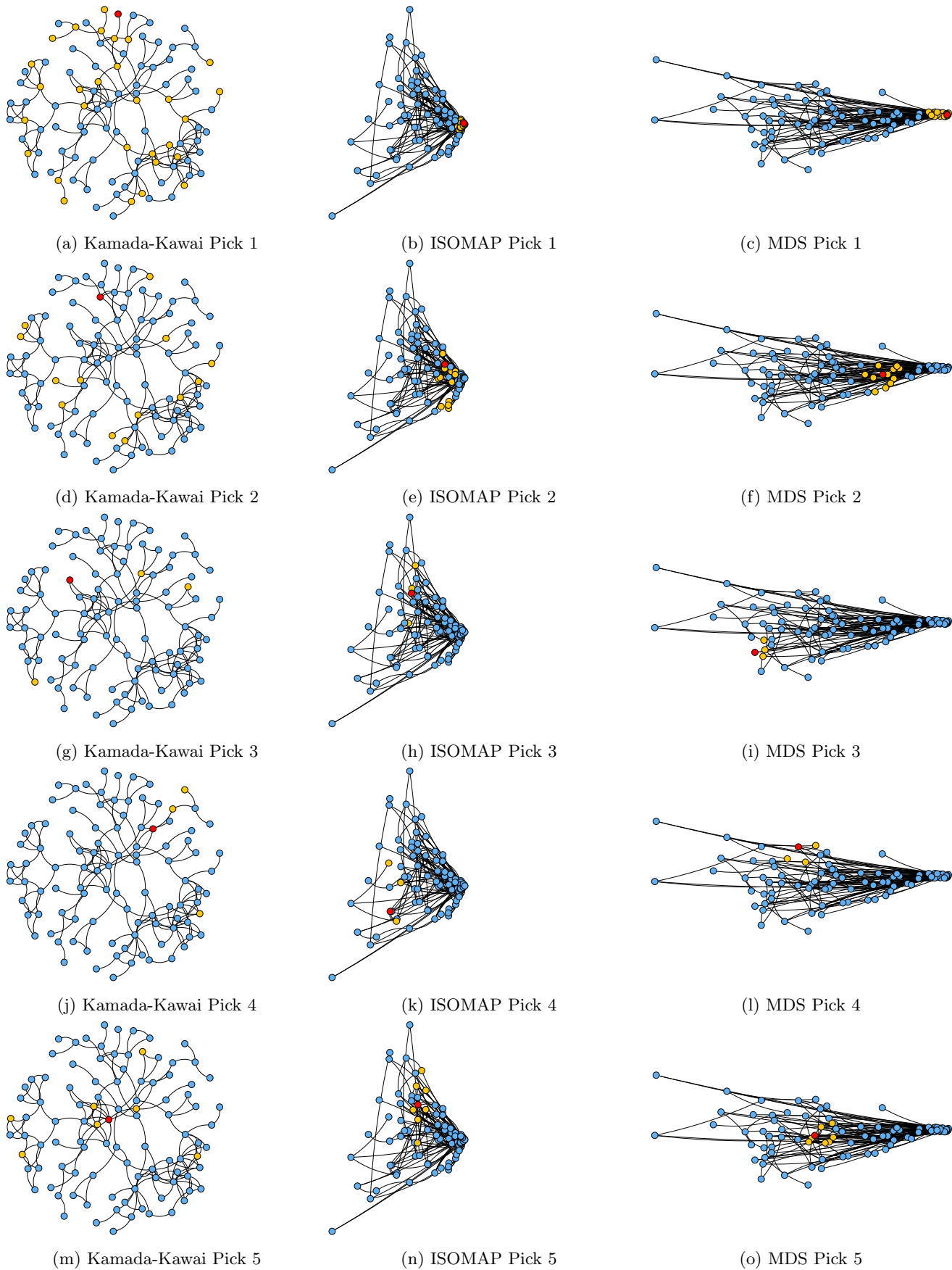


Figure D.1: Feature Picks on the *Documents* dataset. Red vertex: picked vertex, Orange vertices: nearest neighbors to picked vertex (attribute-based euclidean distance).

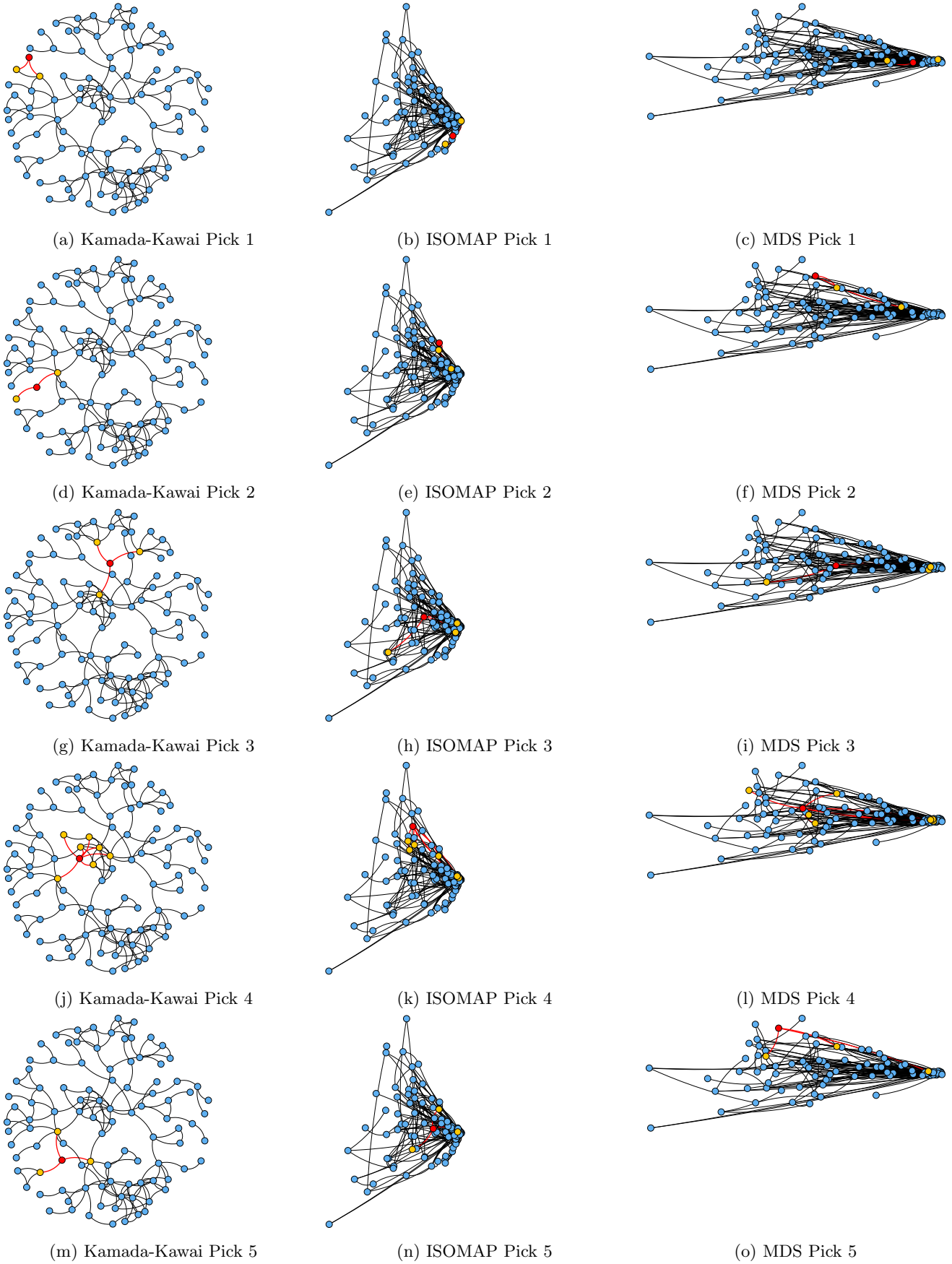


Figure D.2: Neighbor Picks on the *Documents* dataset. Red vertex: picked vertex, Orange vertices: adjacent vertices to picked vertex, Red edges: edges connecting picked vertex and its neighbors.