

SUPPLEMENTARY MATERIAL FOR PP FRAMEWORK

A. Results of Few-Shot Hashing Retrieval with 16-bit and 32-bit Hash Code Lengths

In addition to the comparison results for the 64-bit hash code length presented in SEC. IV-B, we also report the comparison results for 16-bit and 32-bit hash code lengths, as shown in Tables A1 and A2, respectively. The experimental results demonstrate that our proposed PP framework achieves the best performance with both 16-bit and 32-bit hash codes, further highlighting the advantages of our PP framework in Few-Shot Hashing Retrieval.

TABLE A1

COMPARISON OF MAP (%) RESULTS ON 16BIT BETWEEN PP FRAMEWORK AND OTHER METHODS. HIGHER VALUES INDICATE BETTER PERFORMANCE.

Baseline	Method	DSDH			Hashnet			CSQ			DPH		
		5-1	10-1	20-1	5-1	10-1	20-1	5-1	10-1	20-1	5-1	10-1	20-1
Results on <i>miniImageNet</i> (16bit, mAP in %)													
ResNet-18	simple	75.19±0.64	60.80±0.50	41.46±0.35	75.06±0.63	60.23±0.49	44.55±0.37	73.33±0.63	61.06±0.50	45.64±0.37	75.75±0.63	61.34±0.48	44.76±0.37
	laplacian	75.47±0.63	61.67±0.50	42.19±0.38	75.31±0.63	60.47±0.51	44.79±0.36	75.56±0.63	62.08±0.50	46.39±0.37	75.80±0.62	61.53±0.51	45.07±0.36
	ours	80.63±0.68	65.96±0.56	47.36±0.41	78.15±0.67	63.13±0.53	46.54±0.38	80.42±0.66	67.20±0.54	52.24±0.41	79.84±0.66	65.50±0.54	48.71±0.37
WideResNet	simple	77.73±0.61	63.52±0.49	44.28±0.38	77.17±0.61	62.46±0.49	46.68±0.36	75.43±0.61	63.47±0.51	47.85±0.37	78.08±0.61	63.92±0.5	47.61±0.36
	laplacian	77.99±0.62	64.31±0.50	45.13±0.37	77.68±0.62	63.01±0.50	46.79±0.37	78.13±0.62	64.94±0.51	48.36±0.38	78.42±0.60	64.60±0.49	48.41±0.37
	ours	83.11±0.65	68.44±0.56	49.96±0.41	80.04±0.66	65.43±0.54	48.92±0.39	82.44±0.64	69.63±0.54	54.24±0.41	81.93±0.65	67.65±0.54	51.03±0.39
Results on <i>tieredImageNet</i> (16bit, mAP in %)													
ResNet-18	simple	80.64±0.69	67.91±0.55	48.28±0.40	80.78±0.67	67.27±0.55	52.52±0.40	78.80±0.66	68.25±0.53	54.7±0.41	81.20±0.67	67.96±0.54	51.65±0.40
	laplacian	80.81±0.70	68.28±0.55	49.12±0.41	80.62±0.69	67.57±0.57	53.05±0.41	80.88±0.68	69.31±0.55	55.34±0.43	81.04±0.69	68.37±0.55	52.26±0.41
	ours	84.88±0.69	73.83±0.58	58.29±0.45	82.04±0.69	70.06±0.55	55.31±0.44	85.01±0.68	74.40±0.58	61.59±0.46	83.94±0.68	73.17±0.56	59.50±0.43
WideResNet	simple	82.36±0.66	70.81±0.52	52.34±0.42	82.31±0.64	69.64±0.53	54.78±0.39	80.66±0.66	71.30±0.52	58.19±0.42	82.80±0.65	70.85±0.53	54.47±0.38
	laplacian	82.79±0.65	71.49±0.53	53.59±0.42	82.38±0.65	70.00±0.52	55.20±0.40	82.48±0.66	72.23±0.54	58.82±0.41	82.95±0.66	71.35±0.53	55.56±0.39
	ours	86.17±0.65	76.04±0.57	61.46±0.45	83.14±0.69	72.29±0.56	58.87±0.44	86.12±0.66	76.65±0.58	64.58±0.46	85.25±0.66	75.02±0.56	62.43±0.43
Results on CUB (16bit, mAP in %)													
ResNet-18	simple	84.76±0.57	75.54±0.50	55.34±0.41	84.32±0.57	73.73±0.49	58.35±0.41	81.93±0.59	75.35±0.50	62.64±0.41	85.00±0.58	75.50±0.49	58.91±0.41
	laplacian	85.00±0.58	76.74±0.50	56.89±0.41	84.73±0.57	74.52±0.50	59.30±0.42	84.60±0.58	77.20±0.49	63.67±0.41	85.23±0.57	76.09±0.50	60.16±0.42
	ours	90.40±0.56	83.83±0.49	68.52±0.44	87.92±0.58	81.44±0.51	69.88±0.43	89.72±0.56	84.37±0.48	74.30±0.43	89.44±0.57	82.87±0.50	69.67±0.42
WideResNet	simple	89.17±0.49	81.63±0.46	62.99±0.41	88.67±0.50	79.60±0.47	65.20±0.40	86.36±0.53	81.32±0.45	69.21±0.41	89.40±0.49	81.69±0.45	67.08±0.39
	laplacian	89.37±0.50	82.70±0.45	64.86±0.41	89.12±0.50	80.73±0.47	66.73±0.40	89.35±0.50	83.35±0.44	70.52±0.41	89.52±0.51	82.36±0.44	68.73±0.40
	ours	93.53±0.46	88.33±0.41	74.44±0.42	91.63±0.47	86.08±0.44	75.66±0.42	92.85±0.45	88.59±0.42	79.62±0.41	93.01±0.44	87.59±0.42	75.46±0.41

TABLE A2

COMPARISON OF MAP (%) RESULTS ON 32BIT BETWEEN PP FRAMEWORK AND OTHER METHODS. HIGHER VALUES INDICATE BETTER PERFORMANCE.

Baseline	Method	DSDH			Hashnet			CSQ			DPH		
		5-1	10-1	20-1	5-1	10-1	20-1	5-1	10-1	20-1	5-1	10-1	20-1
Results on <i>miniImageNet</i> (32bit, mAP in %)													
ResNet-18	simple	76.73±0.64	63.12±0.49	47.77±0.37	77.15±0.62	63.52±0.49	49.68±0.36	74.07±0.61	62.44±0.50	50.17±0.36	77.03±0.63	63.49±0.49	48.68±0.35
	laplacian	76.91±0.62	63.30±0.50	48.30±0.38	77.10±0.62	63.40±0.50	49.14±0.37	76.33±0.64	63.10±0.51	50.44±0.37	77.10±0.63	63.43±0.50	48.56±0.38
	ours	81.99±0.69	67.70±0.57	51.28±0.40	80.80±0.66	66.77±0.53	51.93±0.38	81.36±0.67	67.93±0.56	54.24±0.40	80.99±0.67	66.76±0.54	51.29±0.40
WideResNet	simple	79.14±0.60	65.91±0.50	50.48±0.37	79.30±0.61	66.19±0.49	52.03±0.36	76.15±0.60	64.86±0.51	52.55±0.37	79.32±0.60	66.27±0.49	51.49±0.35
	laplacian	79.19±0.61	66.06±0.50	50.77±0.38	79.16±0.61	66.14±0.50	51.67±0.37	78.79±0.60	65.82±0.50	52.93±0.37	79.31±0.60	66.34±0.50	51.64±0.36
	ours	84.08±0.66	69.84±0.56	53.52±0.41	83.15±0.64	69.06±0.53	54.12±0.39	83.37±0.64	70.44±0.56	56.46±0.40	83.21±0.64	69.00±0.54	53.53±0.39
Results on <i>tieredImageNet</i> (32bit, mAP in %)													
ResNet-18	simple	82.05±0.67	70.16±0.53	56.40±0.41	82.44±0.66	70.38±0.53	57.42±0.39	79.70±0.67	69.57±0.53	58.46±0.40	82.43±0.66	70.06±0.53	55.68±0.41
	laplacian	81.93±0.66	70.37±0.54	56.92±0.41	82.27±0.66	70.24±0.55	57.20±0.41	81.73±0.67	70.60±0.55	58.74±0.42	82.11±0.66	69.84±0.55	55.66±0.41
	ours	86.32±0.70	75.19±0.59	60.49±0.45	84.69±0.67	73.93±0.57	60.75±0.44	85.25±0.68	74.90±0.59	63.04±0.44	85.13±0.68	74.46±0.57	60.97±0.44
WideResNet	simple	83.60±0.64	73.02±0.53	59.54±0.40	83.85±0.63	73.09±0.53	59.93±0.40	81.30±0.66	72.24±0.52	61.66±0.40	83.79±0.63	72.90±0.52	58.00±0.40
	laplacian	83.57±0.65	73.21±0.53	60.13±0.42	83.72±0.64	72.9±0.54	59.85±0.41	83.28±0.65	73.10±0.53	62.08±0.41	83.65±0.64	73.01±0.54	58.41±0.41
	ours	87.50±0.67	77.25±0.60	64.20±0.46	85.97±0.65	76.01±0.57	63.85±0.44	86.44±0.66	77.13±0.58	66.00±0.45	86.30±0.66	76.52±0.57	64.18±0.44
Results on CUB (32bit, mAP in %)													
ResNet-18	simple	86.23±0.54	78.41±0.47	65.45±0.40	86.35±0.55	77.83±0.49	65.49±0.39	83.09±0.59	76.98±0.49	68.03±0.39	86.44±0.54	77.93±0.49	64.08±0.39
	laplacian	86.19±0.55	78.43±0.49	66.45±0.41	86.31±0.55	77.98±0.49	65.94±0.40	85.58±0.57	78.68±0.48	68.98±0.40	86.35±0.54	78.10±0.49	64.85±0.40
	ours	92.10±0.53	85.22±0.49	73.17±0.43	90.46±0.54	84.28±0.48	73.37±0.41	90.59±0.54	84.96±0.48	75.71±0.42	91.06±0.55	84.46±0.48	71.75±0.42
WideResNet	simple	90.40±0.47	84.10±0.43	72.43±0.40	90.47±0.47	83.80±0.43	72.50±0.37	87.06±0.51	82.82±0.44	74.43±0.39	90.47±0.48	83.94±0.43	71.96±0.38
	laplacian	90.37±0.49	84.51±0.43	73.45±0.40	90.42±0.49	84.19±0.43	73.19±0.38	90.00±0.49	84.28±0.43	75.55±0.39	90.54±0.48	84.34±0.42	72.97±0.39
	ours	94.84±0.44	89.42±0.41	78.39±0.41	93.67±0.44	88.43±0.42	78.92±0.41	93.46±0.44	89.01±0.41	80.92±0.40	94.08±0.44	88.63±0.42	77.44±0.41

B. Results of Cross Datasets with WideResNet

This subsection supplements SEC. IV-C in the main text, providing a quantitative comparison of mAP values and 95% confidence intervals for different methods using WideResNet as the feature extractor under a 5-way-1-shot setting. The results are shown for three different hash code lengths and with DSDH as the hashing objective. Higher values indicate better performance.

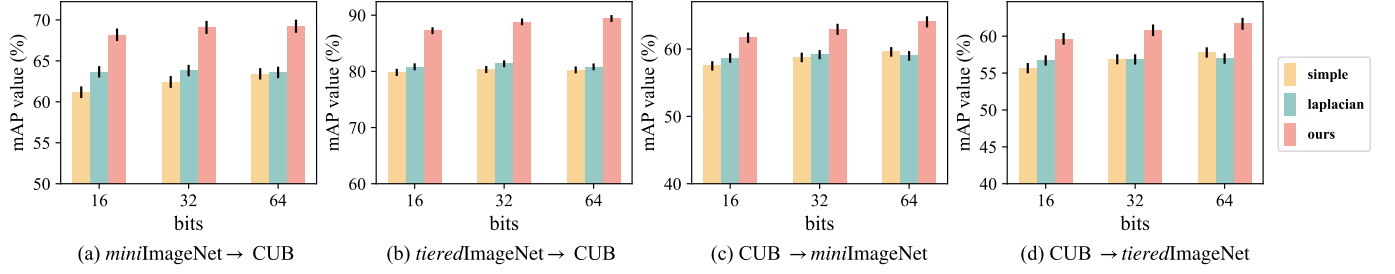


Fig. B1. mAP (%) across datasets with 95% confidence intervals (WideResNet as feature extractor).