Table A1: Ablation of our simplified formula. Our simplified formula achieves a better result than traditional with CORUN.

ASM formula	NIMA ↑	BRISQUE ↑	FADE↑
w/o simplify	5.203	14.469	0.817
w/ simplify(CORUN+)	5.315	11.956	0.751

Table A2: Our method still achieves a leading place under the two settings compared with existing methods in their corresponding settings.

RIDCP[48]		-	Metrics		
Data.+Gen.	Aug.	OTS	NIMA ↑	BRISQUE ↑	FADE↑
✓			4.845	20.779	0.765
		✓	4.991	16.478	0.840
✓	✓		5.315	11.956	0.751

Table A3: Effects of integrating our Colabator with more cutting-edge dehazing methods. The gains brought by Colabator are significant.

ASM formula	NIMA ↑	BRISQUE ↑	FADE↑
C2PNet[60]	4.715	34.314	2.064
C2PNet+	4.823	23.662	1.329
FFA-Net[35]	4.822	33.235	2.080
FFA-Net+	4.839	29.219	0.958
GDN[27]	5.074	33.051	2.611
GDN+	5.258	23.691	0.947

Table A4: Experiment of the full-reference setting with O-HAZE and I-HAZE. On both datasets, our method achieves leading performance.

Datasets	O-HAZE		I-HAZE	
Methods	PSNR ↑	SSIM ↑	PSNR ↑	SSIM ↑
GDN[27]	18.92	0.672	18.73	0.769
MSBDN[10]	24.36	0.749	19.62	0.618
FFA-Net[35]	22.12	0.770	19.72	0.733
DeHamer[13]	25.11	0.777	-	-
EDN-GTM[63]	23.46	0.820	22.90	0.827
MB-TaylorFormer[36]	25.05	0.788	-	-
CORUN (Ours)	25.66	0.847	23.90	0.868

Table A5: Superiority of our method than previous dehazing methods.

Methods	NIMA ↑	BRISQUE ↑	FADE ↑
C2PNet [60]	4.715	34.314	2.064
RIDCP [48]	4.965	17.293	0.944
CORUN+ (OTS)	4.991	16.478	0.840
CORUN+ (RIDCP Pipeline)	5.315	11.956	0.751

Table A6: Comparison experiments on different density level of haze.

Medium Density				High Density			
Methods	NIMA ↑	BRISQUE ↑	FADE ↑	Methods	NIMA ↑	BRISQUE ↑	FADE ↑
D4[52]	4.814	36.731	1.170	D4[52]	4.809	32.362	1.475
RIDCP[48]	5.036	18.503	1.006	RIDCP[48]	5.131	16.784	1.076
DGUN[33]	4.816	29.767	1.241	DGUN[33]	4.949	27.669	1.336
Ours CORUN+	5.290	10.101	0.810	Ours CORUN+	5.350	12.180	0.839

Table A7: Ablations of eq.15 and eq.16 loss functions. Our strategy achieves a better result.

Loss	NIMA ↑	BRISQUE ↑	FADE ↑
eq.15 Only	5.249	13.997	1.035
eq.16 Only	5.220	12.484	0.795
Both (Ours)	5.315	11.956	0.751

Table A8: Robustness evaluation of DA-CLIP, the differences between CLIP result and human result.

	difference<0.2	$0.2\leq$ difference ≤ 0.5	difference>0.5
User & DA-CLIP[31]	71%	21%	8%

Table A9: Ablations of DA-CLIP module and other modules of Colabator. Our strategy achieves a better result.

Methods	NIMA ↑	BRISQUE ↑	FADE ↑
Only DA-CLIP[31]	4.907	15.793	0.803
w/o DA-CLIP[31]	5.358	11.200	0.856
Ours CORUN+	5.315	11.956	0.751

Table A10: Our Colabator achieve better effect than mean-teacher.

Strategy	NIMA ↑	BRISQUE ↑	FADE ↑
w/ Mean-teacher	4.921	15.728	0.912
w/ Colabator(CORUN+)	5.315	11.956	0.751

Figure A1: **Red** region reflects all past methods have had haze residues, but our method have the least in the same case. **Purple** region shows our method restores richer detail and truer colors.

Figure A2: Examples of **correct** and **incorrect** judgments of DA-CLIP.

Figure A3: Ablation of CPMM module.

Table A11: Ablation of our trusted weights present as a map or value.

Methods	NIMA ↑	BRISQUE ↑	FADE ↑
Only Full	5.229	13.099	0.803
Partition+Full(CORUN+)	5.315	11.956	0.751

Table A12: Ablation of CPMM module of our CORUN.

Modules	NIMA ↑	BRISQUE ↑	FADE ↑
Hazy(Input)	4.483	36.642	2.484
w/o CPMM	4.836	38.197	1.362
w/ CPMM (CORUN+)	5.315	11.956	0.751

Table A13: Effects of strong aug. with other Colabator components.

Augmentation	NIMA ↑	BRISQUE ↑	FADE ↑
w/o Colabator	4.856	16.541	1.091
w/o Strong aug.	5.084	12.671	0.813
w/ Strong aug. (CORUN+)	5.315	11.956	0.751

Table A14: Results of Colabator work with more networks and tasks.

Real underwater image enhancement.				Real robotic laparoscopic hysterectomy desmoke.			
Methods	NIMA ↑	BRISQUE ↑	FADE ↑	Methods	NIMA ↑	BRISQUE ↑	FADE ↑
SwinIR [64]	3.392	31.775	0.536	SwinIR [64]	3.056	40.668	0.655
SwinIR+Colabator	3.650	27.247	0.472	SwinIR+Colabator	3.317	35.519	0.639
Restormer[65]	3.981	25.688	0.482	Restormer[65]	3.554	33.356	0.628
Restormer+Colabator	4.185	16.489	0.381	Restormer+Colabator	3.738	30.933	0.614
GRL [66]	3.816	25.795	0.506	GRL [66]	3.503	31.682	0.601
GRL+Colabator	3.925	18.854	0.423	GRL+Colabator	3.716	27.663	0.585
AST [67]	4.073	22.772	0.473	AST [67]	3.808	29.735	0.563
AST+Colabator	4.186	16.353	0.435	AST+Colabator	3.952	26.483	0.538

Table A15: Ablation of calculation strategy of trusted weights.

Methods	NIMA ↑	BRISQUE ↑	FADE ↑
Product	5.487	14.949	0.807
Summation(CORUN+)	5.315	11.956	0.751

Table A16: Ablation of the selection of NR-IQA modules.

Metrics	NIMA ↑	BRISQUE ↑	FADE ↑
NIMA	5.337	12.242	0.825
BRISQUE	5.245	11.652	0.813
NIQE	5.122	12.900	0.835
MUSIQ(CORUN+)	5.315	11.956	0.751

Table A17: Comparison of whether to clean URHI dataset.

Datasets	NIMA ↑	BRISQUE ↑	FADE ↑
URHI-	5.348	12.784	0.832
URHI	5.315	11.956	0.751