

**Table A.2:** Overview of the test datasets detailing the weather and daytime conditions, along with the severity levels for each.

Augmentation	Description	Parameters	Range
AdditiveNoise	Apply random Gaussian noise with shared spatial mode and mean 0.	std	[0.05, 0.5]
AutoContrast	Adjust the contrast by stretching the intensity range.	No params	-
Brightness	Adjust the brightness of the image.	value	[-1.0,1.0]
ChannelDropout	Randomly drop channels in the input image.	No params	-
ChannelShuffle	Randomly rearrange channels of the image.	No params	-
Chrom. Aberration	Adds lateral chromatic aberration by shifting red and blue channels with secondary distortion limit [-0.05,0.05].	P.DistortionLimit	[0.05,5]
Color	Adjust the color balance of the input image.	value	[0.1,1.0]
ColorJitter	Randomly changes the brightness, contrast, saturation, and hue.	Brightness Contrast Saturation	[-1.0,1.0] [-1.0,1.0] [-1.0,1.0]
Contrast	Adjust image contrast of the input image.	value	[-1.0,1.0]
Cutout	Randomly removes rectangular regions from the image.	NumHoles	[1.0,10.0]
Defocus	Apply defocus blur with radius=3	AliasBlur	[5,15]
Drop	Adds raindrops to the input image.	Sigma Size Frequency Shape	[3.0,6.0] [20.0,65.0] [3.0,12.0] [0.9,0.4]
Emboss	Apply embossing effect to the image.	Alpha Strength	[0.05,1.0] [0.05,1.0]
Equalize	Equalize the image histogram.	No params	-
Fog	Adds fog to the image.	Density Wibbleddecay	[1.0,5.5] [1.85,1.6]
GlassBlur	Apply a glass blur effect to the input image.	Sigma	[0.1,1.0]
HueSaturationValue	Randomly change hue, saturation, and value of the input image.	HueShift SatShift ValShift	[10,100] [10,100] [10,100]
Invert	Invert image by subtracting pixels from max value.	No params	-
IsoNoise	Simulates high ISO noise with colorShift in [0.01, 1].	Intensity	[0.1,1.0]
MotionBlur	Apply motion blur using a directional kernel.	BlurLimit	[3.0,25.0]
PixelDropout	PerChannel=True	DropoutProb	[0.1,0.9]
PlasmaBrightness	Modifies brightness and contrast using a plasma fractal with roughness=5.	Brightness Contrast	[-1.0,1.0] [-1.0,1.0]
Posterize	Reduce the number of bits for each color channel.	value	[8,1]
Rain	Adds rain with threshold=0.8, radius=10, sigma=14, alpha=0.9.	Center Std Zoom	[0.2,0.55] [0.3,0.75] [2.0,1.5]
RandomFog	Simulates fog using random artifacts with alphaCoef=0.08.	FogCoef	[0.05, 1.0]
RandomGamma	Applies random gamma correction to the image.	GammaLimit	[80, 200]
RandomGravel	Adds gravel-like artifacts to the input image.	NumberPatches	[5,50]
RandomRain	Adds rain effects to an image.	value	[1,10]
RandomSnow	Applies a random snow effect to the input image.	SnowPoint	[0.1,1.0]
Rotation	Rotate the image.	Angle	[-30,30]
SaltAndPepper	Apply salt and pepper noise to the input image.	Amount	[0.01,0.25]
Sharpness	Sharpens the input image.	value	[1.0,2.0]
ShearX	Apply a shear transformation on the x-axis.	x	[-30.0,30.0]
ShearY	Apply a shear transformation on the y-axis.	y	[-30.0,30.0]
ShotNoise	Adds shot noise (using Poisson) to simulate photon counting.	Scale	[0.05,0.5]
Snow	Center: 0.2, Radius: 6, Sigma: 2, Alpha: 0.95	Threshold Std Zoom	[0.85,1.1] [0.3,1.2] [3.5,4.7]
Solarize	Invert all pixel values above a threshold.	value	[230.0,0.0]
TranslateX	Apply a translation transform on the x-axis.	x	[-0.45,0.45]
TranslateY	Apply a translation transform on the y-axis.	y	[-0.45,0.45]
ZoomBlur	Apply zoom blur transform.	MaxFactor	[1.03,1.3]