Supplemental material

Table S1: imgaug parameters for conventional augmentation

Parameter	weak	weak-medium	medium	medium-strong	strong
Rotation (`Rotate()`)[1]					
`rotate=`	±5	±10	±20	±30	±45
Snowy landscape (`FastSnowyLandscape()`)					
`lightness_threshold=`	220.0	200.0	180.0	160.0	140.0
`lightness_multiplier=`	1.6	2.2	2.8	3.4	4.0
Snowflakes (`imgcorruptlike.Snow()`)					
`severity=`	1	2	3	4	5
Rain (`Rain()`)					
`nb_iterations=`	1	1	2	2	3
`drop_size=`	0.05	0.15	0.15	0.175	0.20
`speed=`	0.25	0.20	0.20	0.20	0.20
Fog (`CloudLayer()`)[2]					
`density_multiplier=`	0.30	0.40	0.50	0.65	0.90
Gaussian Blur (`GaussianBlur()`)					
`sigma=`	0.7	1.0	2.0	3.0	4.0
Hue and saturation change (`AddToHueAndSaturation()`)					
`value_hue=`	±5	±16	±26	±68	±125
`value_saturation=`	0	0	0	0	32
Exposure (`Add()`, `Multiply()`)[3]					
(low) `value=`	-10.00	-20.00	-30.00	-40.00	-50.00
(low) `mul=`	0.90	0.80	0.70	0.60	0.50
(high) `value=`	10.00	20.00	30.00	40.00	50.00
(high) `mul=`	1.11	1.25	1.43	1.67	2.00

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[1] Additional parameters for rotation, used across all strengths: `mode=['symmetric', 'reflect']`

[2] Additional parameters for fog, used across all strengths: `intensity_mean=240`, `intensity_freq_exponent=-1.75`, `intensity_coarse_scale=2`, `alpha_min=0.8`, `alpha_multiplier=0.3`, `alpha_size_px_max = 5`, `alpha_freq_exp=-3`, `sparsity=0.9`

[3] Exposure was either underexposed (low values) or overexposed (high values) implemented with `OneOf()`. In both cases, `Add()` and `Multiply()` were executed sequentially (in this order) with `Sequential()`

Table S2: per class accuracies for testing on real data

augmentation		class accuracy					
strength	type	unknown	sky	vegetation	rails	lightsignal	shapesignal
strong	conv. + sem.	0.901859	0.866715	0.674393	0.479915	0.60813	0.323817
	conventional	0.903566	0.881005	0.651493	0.409718	0.549407	0.382491
	semantic	0.902589	0.855426	0.635115	0.44615	0.600423	0.291315
medium-strong	conventional	0.906037	0.821085	0.630904	0.363306	0.56132	0.383765
	semantic	0.896076	0.849188	0.628569	0.405077	0.615413	0.312844
medium	conventional	0.895903	0.711767	0.654485	0.328711	0.58099	0.378816
	semantic	0.895505	0.810142	0.643271	0.376876	0.591004	0.325623
weak-medium	conventional	0.87697	0.722992	0.681023	0.32664	0.559138	0.370551
	semantic	0.893888	0.736366	0.639194	0.383381	0.552729	0.346852
weak	conventional	0.887158	0.821949	0.650313	0.310993	0.526335	0.373803
	semantic	0.895476	0.742872	0.65687	0.341115	0.522407	0.309018

Table S3: per class accuracies for testing on synthetic data

augmentation		class accuracy					
strength	type	unknown	sky	vegetation	rails	lightsignal	shapesignal
strong	conv. + sem.	0.959204	0.975528	0.94564	0.863383	0.205275	0.24444
	conventional	0.96062	0.98308	0.950137	0.843578	0.298865	0.276999
	semantic	0.956622	0.97619	0.931133	0.877281	0.175111	0.249588
medium-strong	conventional	0.963019	0.980189	0.951953	0.843028	0.305432	0.278935
	semantic	0.958989	0.981044	0.938015	0.866319	0.245828	0.281934
medium	conventional	0.962327	0.980234	0.957216	0.834508	0.351321	0.306494
	semantic	0.961221	0.981339	0.940074	0.842526	0.304305	0.31435
weak-medium	conventional	0.961438	0.979488	0.958355	0.820607	0.349085	0.314363
	semantic	0.961527	0.97854	0.951733	0.835526	0.344684	0.301356
weak	conventional	0.962511	0.960248	0.945188	0.819543	0.375075	0.300725
	semantic	0.958129	0.978256	0.958477	0.827652	0.304782	0.291868