Stage 1: Self-supervised Disparity Correspondence Learning

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Adverse Pairs

Translation Model T^c

Stereo Model

Feature Extractor

Shared Weights

Clean Pairs

Feature Extractor

Disparity Estimation

D_{adv}

D_L

$\mathcal{L}_{dc}$

Disparity Contrastive Loss

$\mathcal{L}_{photo}$

Photo-metric Consistency

(a)

Stage 2: Adverse Weather Distillation

Translation Model T^c

Stereo Model f^*

Stereo Model f

LR Check

$\mathcal{L}_{kd}$

(b)

frozen weights

weights being trained

CA cross attention

cost aggregation network

VFM vision foundation model

clear day

rain day

fog day

night day

Feature Extractor

$\mathbf{I}_{L,R}$

VFM

$l = 4$

$l = 3$

$l = 2$

$l = 1$

CA

CA

CA

CA

$\mathbf{I}_{L,R}$

$\times \frac{1}{2}$ $\times \frac{1}{4}$ $\times \frac{1}{8}$ $\times \frac{1}{16}$ $\times \frac{1}{32}$

$\mathbf{F}_{L,R}$

FPN

(c)