Pre-train
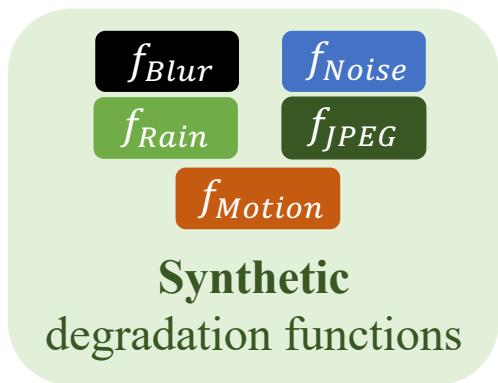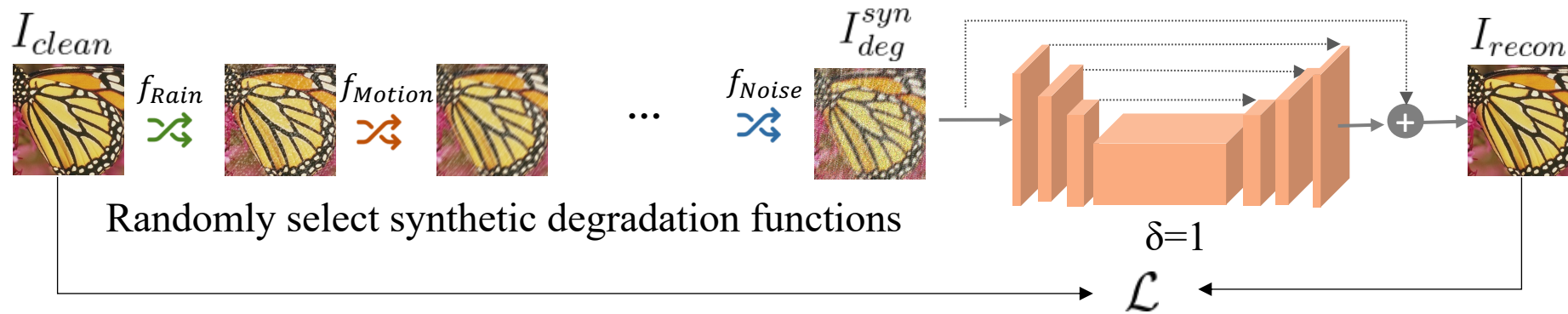
: Randomly select   : Ratio of learnable network parameter (δ)
1   0.5   0

I_{clean} f_{Rain} f_{Motion} ... f_{Noise} I_{deg}^{syn} I_{recon}

Randomly select synthetic degradation functions

$\delta=1$

$\mathcal{L}$

f_{Blur} f_{Noise}
f_{Rain} f_{JPEG}
f_{Motion}

Synthetic degradation functions

(a) Pre-train with Random Order Degradation (**PROD**)

Fine-tune

Raindrop   Haze   ...
Blur   Rain

Vairous real degradation pairs

I_{deg}^{real} I_{recon}

I_{clean}

Different δ

$\mathcal{L}$
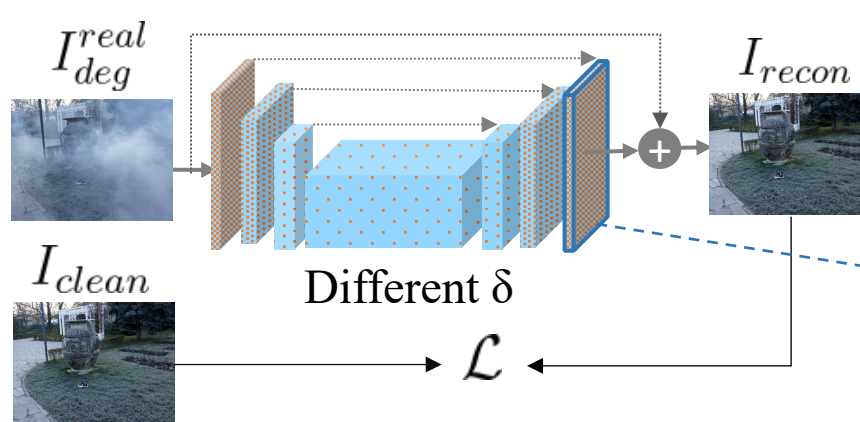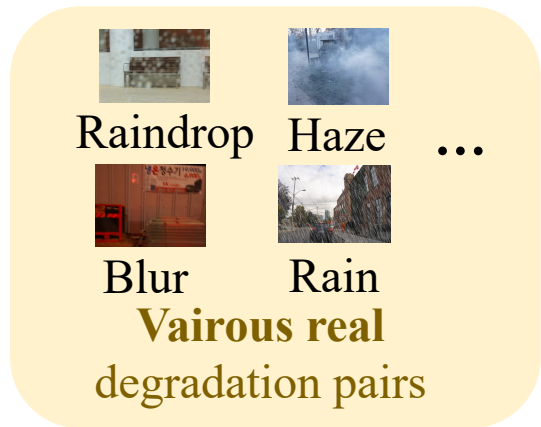
(b) Parameter efficient fine-tuning using **CoLoRA**

k

B r_i

d W_0 d A **Flexible r** based on contribution

k r_i

(c) **CoLoRA**