Blind Single Image Super Resolution

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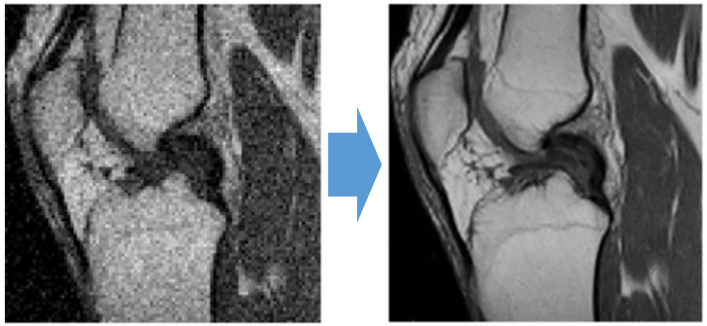
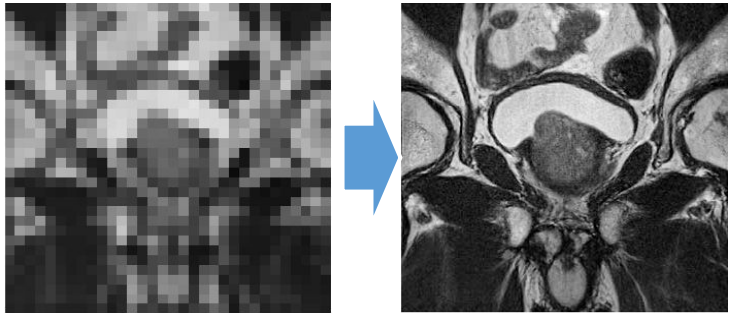
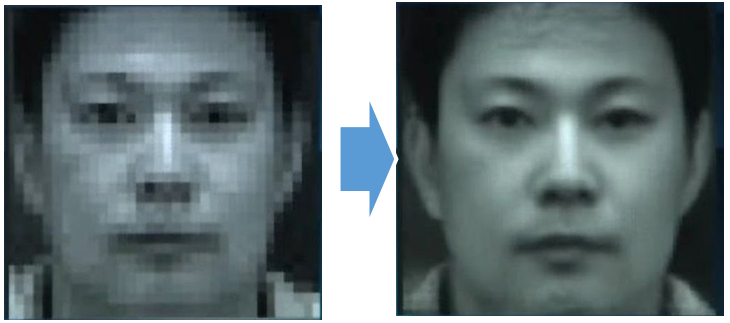
Super Resolution

Medical Image Processing

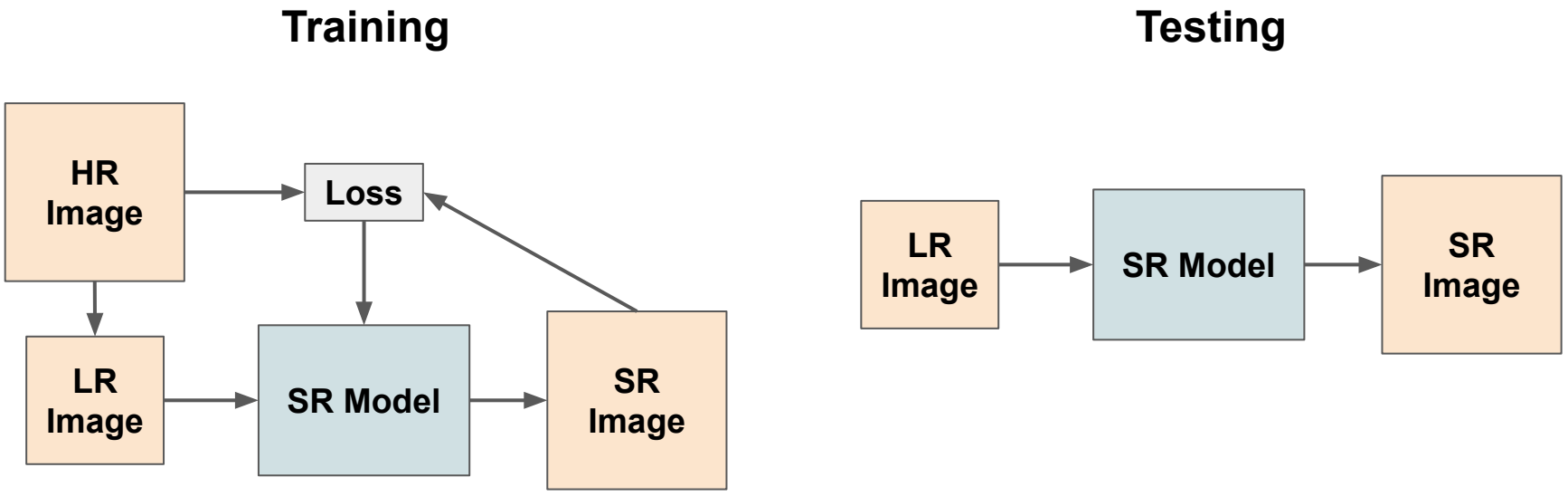




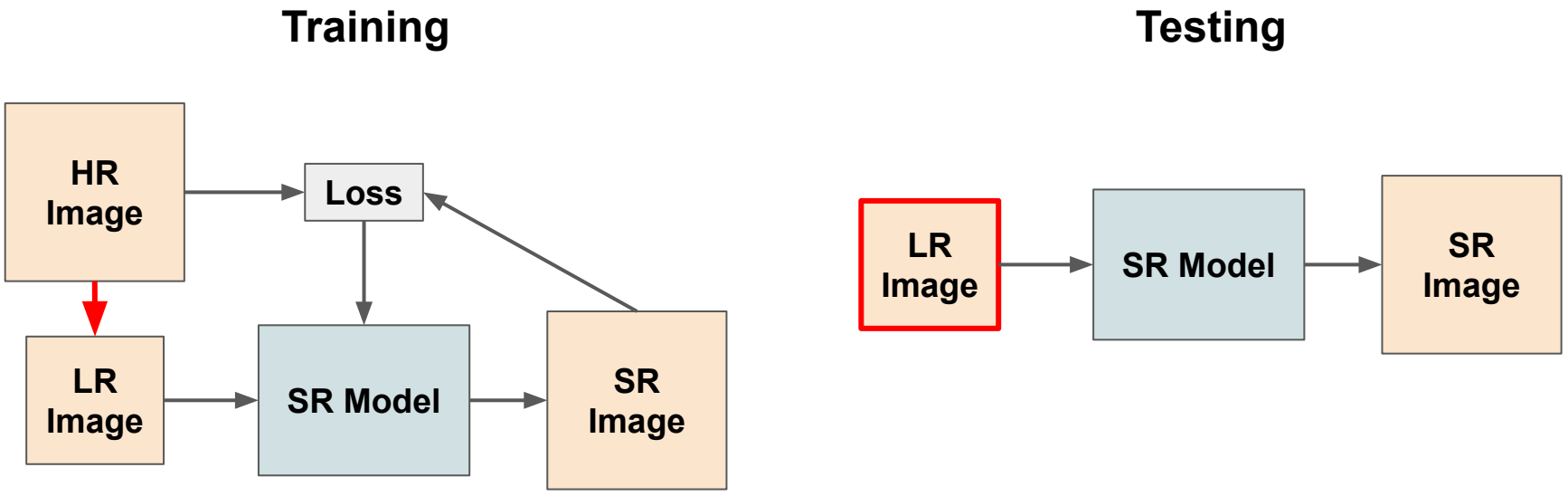
Surveillance



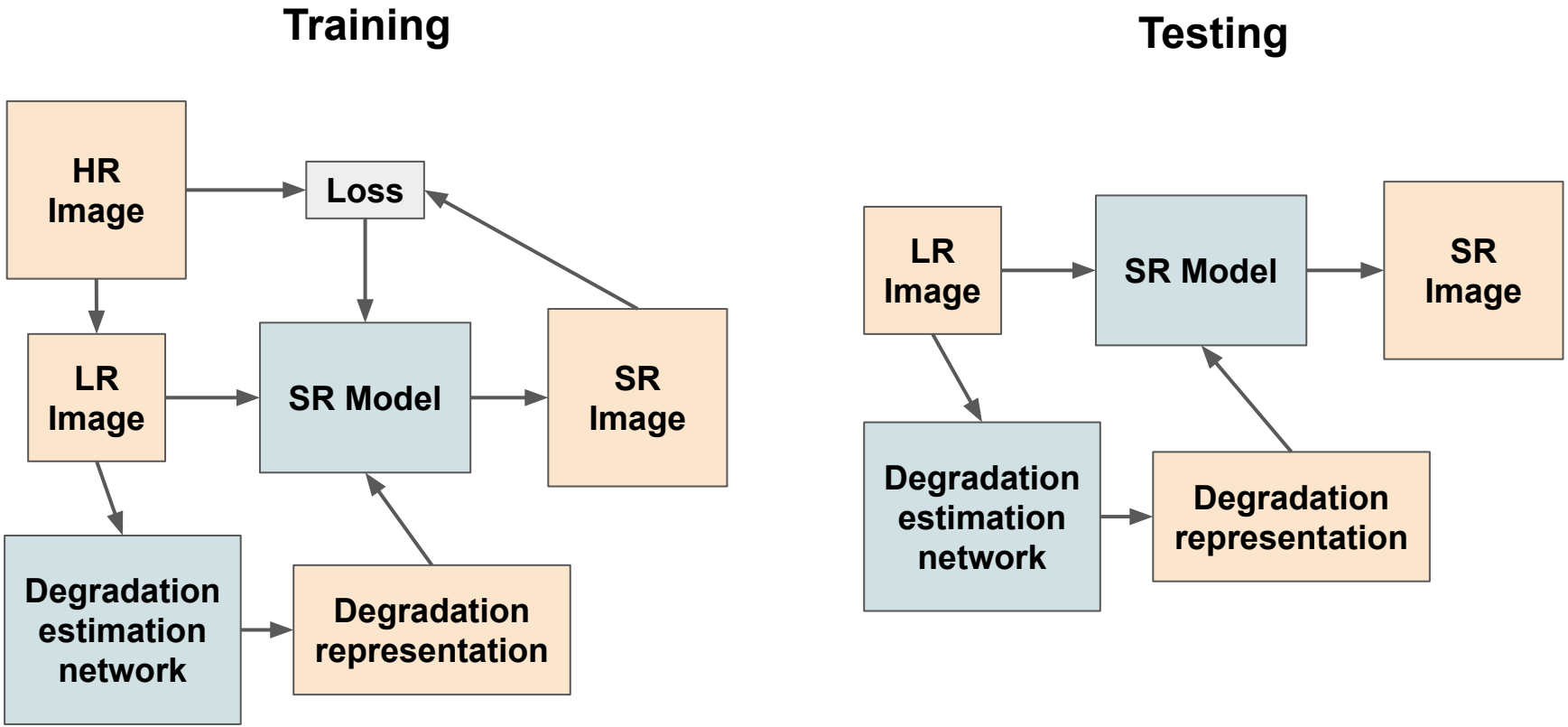
Super Resolution



Problem with SR Models



Blind (degradation aware) SR Models



Enhanced Deep Residual Network SR

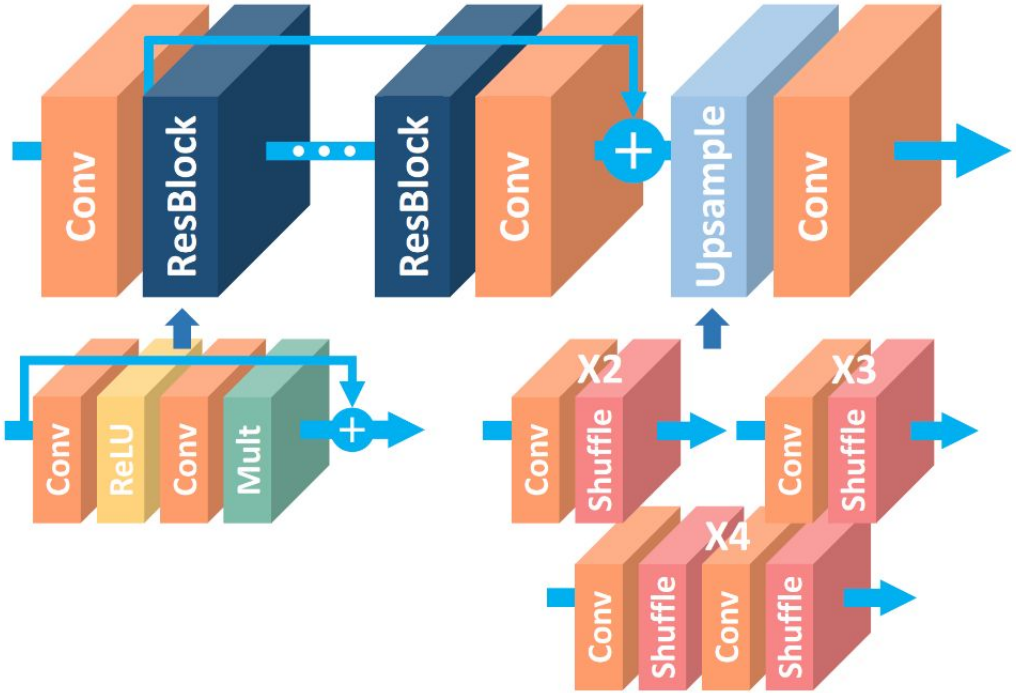


Image Ref: Enhanced Deep Residual Networks for Single Image Super-Resolution Bee Lim, Sanghyun Son, Heewon Kim, Seungjun Nah, Kyoung Mu Lee

Unsupervised Degradation Representation Learning

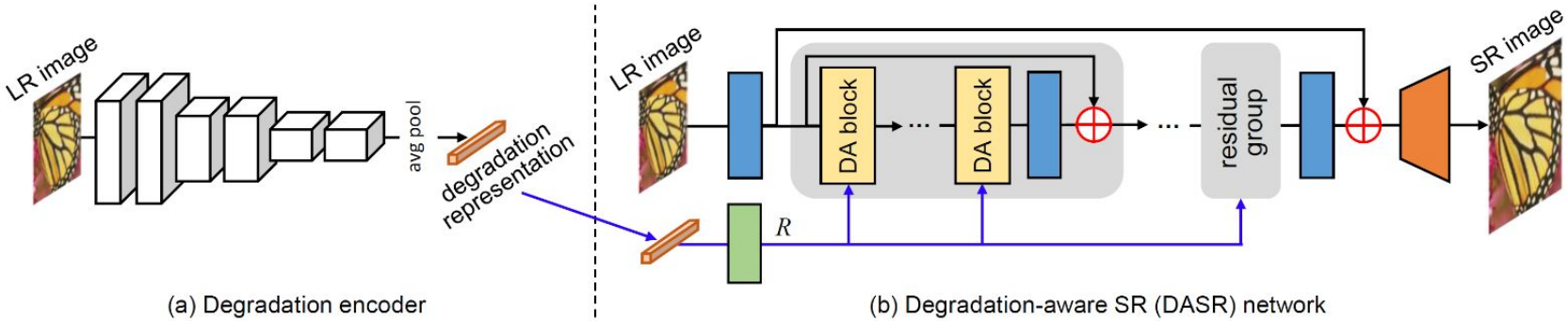


Image Ref: Unsupervised Degradation Representation Learning for Blind Super-Resolution Longguang Wang, Yingqian Wang, Xiaoyu Dong, Qingyu Xu, Jungang Yang, Wei An, Yulan Guo

Unsupervised Degradation Representation Learning

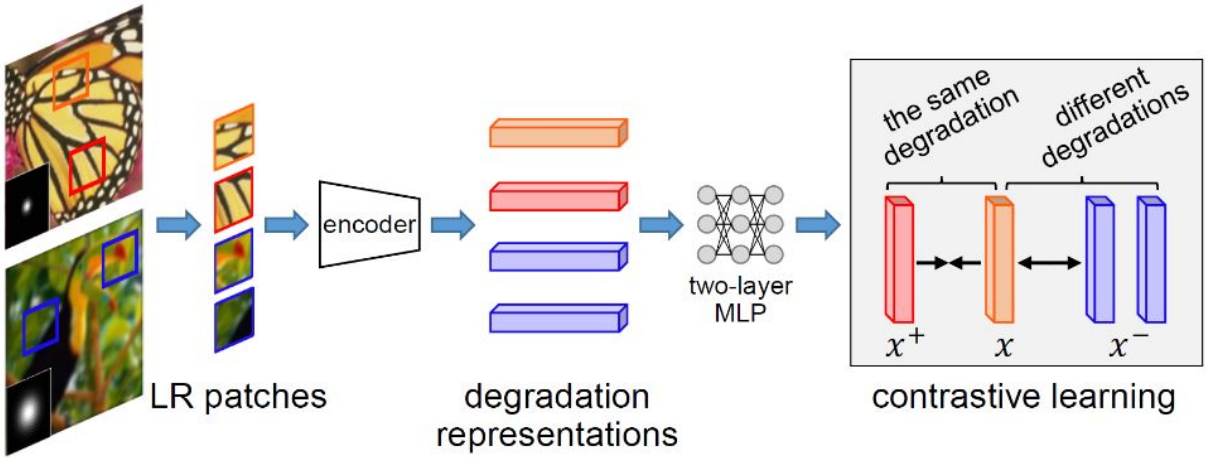


Image Ref: Unsupervised Degradation Representation Learning for Blind Super-Resolution Longguang Wang, Yingqian Wang, Xiaoyu Dong, Qingyu Xu, Jungang Yang, Wei An, Yulan Guo

KOALAnet: Kernel-Oriented Adaptive Local Adjustment Network

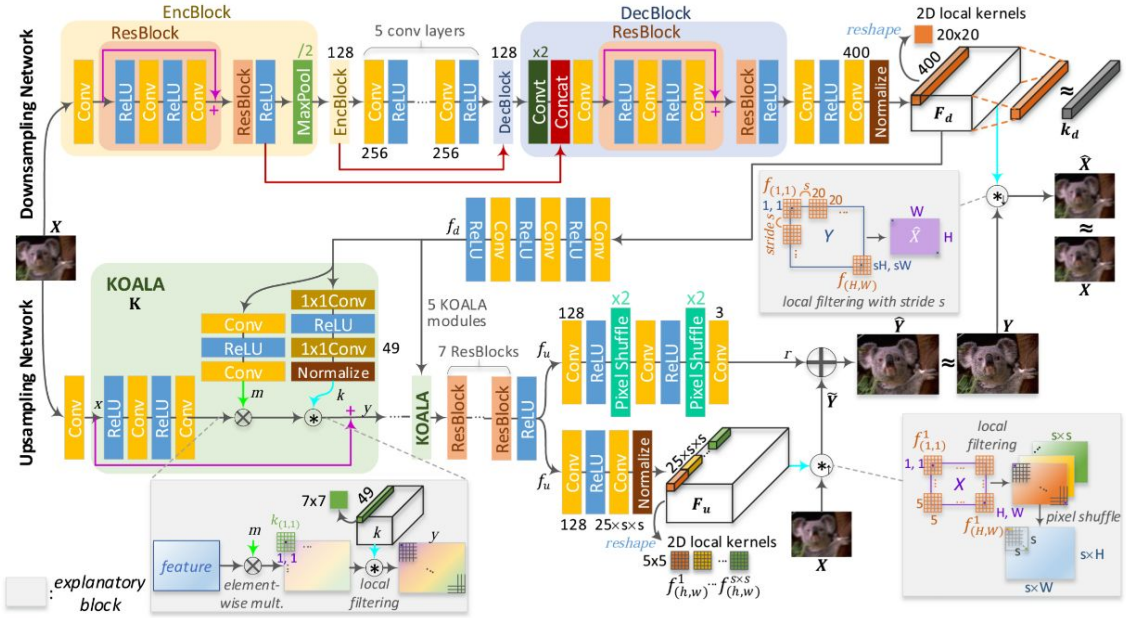


Image Ref: KOALAnet: Blind Super-Resolution using Kernel-Oriented Adaptive Local Adjustment

Benchmark

Pre-trained models released by Authors

Scale x4	Set 5	Set 14	BSD 100	Urban 100	Manga 109	Div2K Val 100
Bicubic	24.86/0.7105	23.20/0.6240	23.86/0.6030	20.67/0.5774	22.09/0.7183	25.71/0.7184
EDSR	25.04/0.7239	23.49/0.6343	24.08/0.6116	21.06/0.6014	22.76/0.7407	26.10/ 0.7301
UDRL	27.34/0.7999	24.78/0.6922	25.02/0.6711	22.37/0.6815	25.43/0.8236	27.20/0.7756
KOALAnet	**28.23/0.8337**	**25.31/0.7105**	**25.54/0.6873**	**23.17/0.7137**	**26.52/0.8488**	**27.96/0.7939**

Benchmark

Models trained from scratch

Scale x4	No Params	No Epochs	Set 5	Set 14	BSD 100	Urban 100	Manga 109	Div2K Val
Bicubic	NA	NA	24.86/0.7105	23.20/0.6240	23.86/0.6030	20.67/0.5774	22.09/0.7183	25.71/0.7184
EDSR	~ 48 Mn	unknown	25.04/0.7239	23.49/0.6343	24.08/0.6116	21.06/0.6014	22.76/0.7407	26.10/ 0.7301
EDSR+	5,487,433	300	25.68/0.7393	23.02/0.6347	23.82/0.6287	20.94/0.6041	22.64/0.7303	25.74/0.73060
UDRL	5,969,283	100+200	20.70/0.5381	19.99/0.4913	21.50/0.5007	19.22/0.4654	18.26/0.5337	22.65/0.5980
KOALAnet	6,545,416	**50+50+110**	**25.72/0.7752**	**23.88/0.6721**	**24.39/0.6529**	**21.60/0.6515**	**23.40/0.7839**	**26.22/0.7592**

Thank You!

Questions?