



Introduction

 CNN models exhibit a major flaw: they are biased towards learning low-frequency signals. This bias becomes more problematic for the image SR task which targets reconstructing all fine details and image textures. Below is a visual comparison (×4) on "image 024" from Urban100. Existing methods suffer from blurring artifacts.



Below is a comparison of distributions for a sample of sequential pixels sampled from the patches shown above. Existing methods produce an overly smooth distribution. We aim to address this problem via two proposed modules: dynamic high pass filtering and matrix multi-spectral channel attention.



• The two proposed modules added to the standard residual block in RCAN (a) and ours (b).



Dynamic High-Pass Filtering and Multi-Spectral Attention for Image Super-Resolution

Salma Abdel Magid¹, Yulun Zhang², Donglai Wei³, Won-Dong Jang¹, Zudi Lin¹, Yun Fu², Hanspeter Pfister¹ ¹Harvard University ²Northeastern University ³Boston College

Ours







- essential details and textures.

Dynamic High Pass Filtering (HPF)

Weight generation (G(X)) and application in the dynamic filtering layer



Qualitative Results

• Visual comparison for ×4 SR on Urban100 dataset. Most compared methods suffer from blurring artifacts. Our method is able to reconstruct high-frequency details better than existing methods.