IMAGE DEHAZING

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Saturday 19th November, 2022

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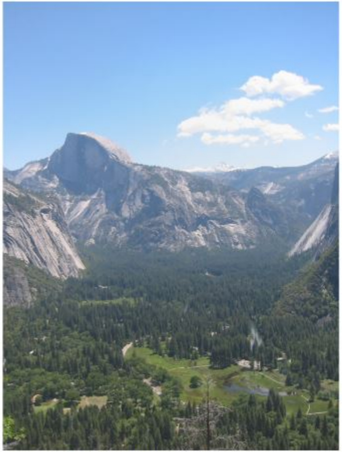
Area Of Work



Original Hazy Image

Haze Removed Image

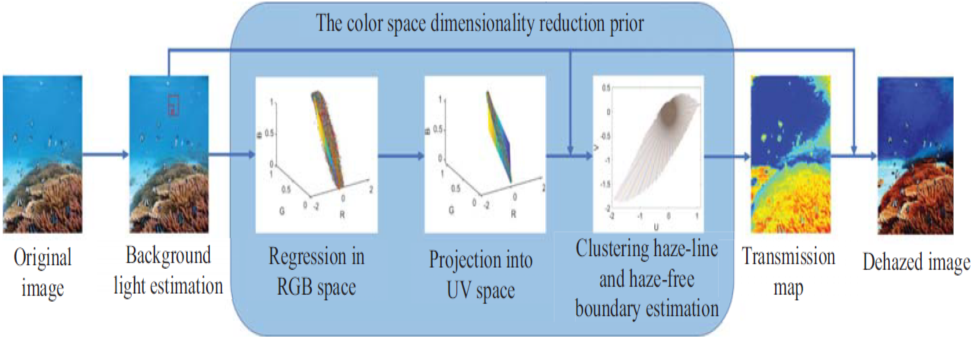
Area Of Work (Cont..)

- Process of visually improving the degraded visibility caused by atmospheric conditions.
- Remove the haze or fog in the image completely without degradation.
- Image dehazing is an increasingly widespread approach to address the degradation of images of the natural environment by low-visibility weather, dust and other phenomena.
- Haze is a common atmospheric phenomenon caused by small particles in the air, leading to degradation of image clarity.
- Applications of this technique include video surveillance, underwater imaging, image composting, image editing,interactive photomontage etc.

Area Of Work (Cont..)

- Dehazing methods based on deep learning.
- Divided into supervised ID and unsupervised ID.
- Supervised methods require pairs of hazy images and haze-free images/transmission maps.
- The unsupervised methods often take unpaired images as the training set.

UNDERWATER IMAGE DEHAZING USING THE COLOR SPACE DIMENSIONALITY REDUCTION PRIOR



UNDERWATER IMAGE DEHAZING USING THE COLOR SPACE DIMENSIONALITY REDUCTION PRIOR

- Propose a novel dehaze model is “colour space dimensionality reduction prior”.
- Projecting all pixels from RGB colour space to UV space without causing any excessive colour shift.
- Get an haze free boundary in the UV space
- Using UIEB Dataset

UNDERWATER IMAGE DEHAZING USING THE COLOR SPACE DIMENSIONALITY REDUCTION PRIOR

- Background light estimation
- Estimate the transmission map(CSDRP)
- RGB space to UV space
- The PSNR of the projected images, compared to the original ones, range from 36.82dB to 56.33dB and share an average of 46.57dB
- Means the process of projection does not lead to any unacceptable error.

COLOR TRANSFER FOR UNDERWATER DEHAZING AND DEPTH ESTIMATION

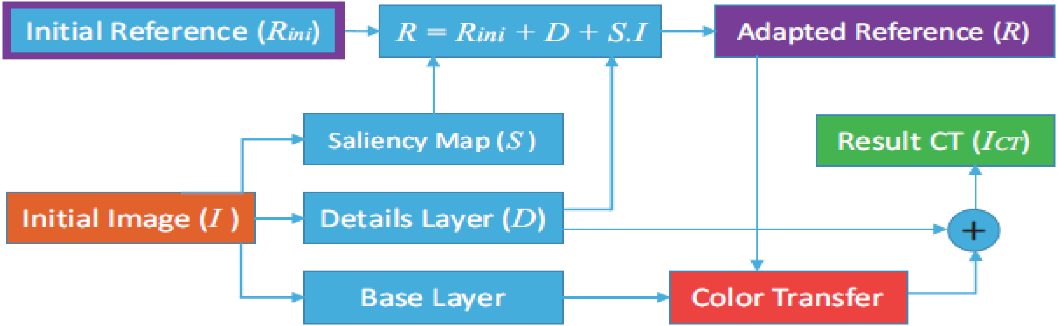
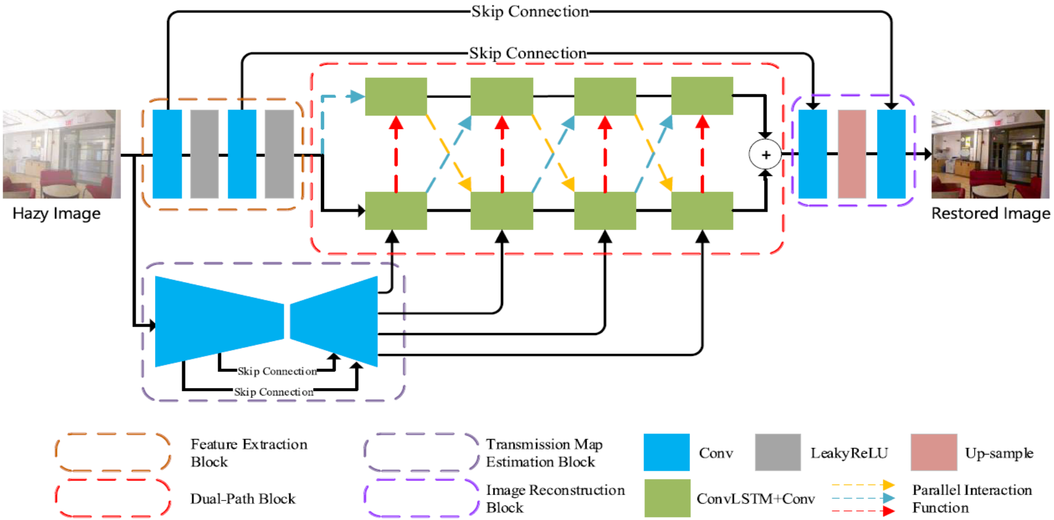


Fig. 3. *Overview of our color transfer strategy.*

COLOR TRANSFER FOR UNDERWATER DEHAZING AND DEPTH ESTIMATION

- Mcglamery under water image formation model
- Using the conventional dark channel prior to estimate the transmission map and the back scattered light parameter involved in the model
- The transmission and back scattered light are accurately estimated by employing the dark channel prior on the color transferred image.
- A reference image using transmission occuring
- DCP are generally using outdoor scenes.

Single Image Dehazing via Dual-Path Recurrent Network



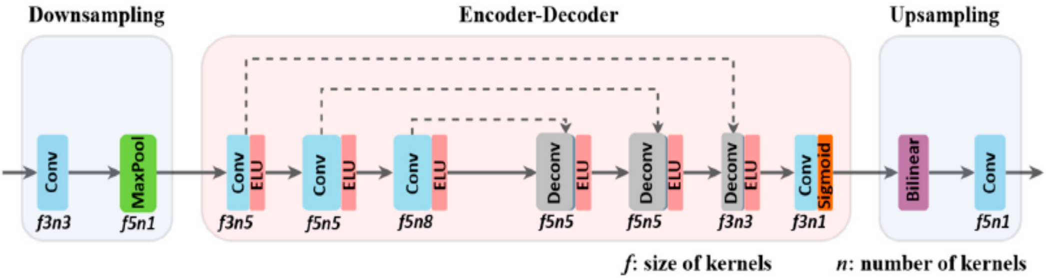
Single Image Dehazing via Dual-Path Recurrent Network

- An image can be decomposed into two parts: the basic content and details
- Its correspond to the low-frequency and high-frequency information of the image.
- The core structure of DPRN is a dual-path block, which uses two parallel branches to learn the characteristics of the basic content and details of hazy images.
- Each branch consists of several Convolutional LSTM blocks and convolution layers.

Single Image Dehazing via Dual-Path Recurrent Network

- FEB : first 3×3 convolution layer increases the width of the feature maps to 16.
- The second 4×4 convolution layer reduces the resolution of the feature maps by half and increases the width to 32.
- Leaky ReLU with a negative slope of 0.1 is added.
- TMEB : it contain 14 components.
- The output features of the transmission map estimation block and feature extraction block are fed into the dual-path block.
- DPB: Basic details basic contents are restored by dual path.
- It have occuring process parallel interaction function.
- image resconstruction block

Lightweight and Efficient Image Dehazing Network Guided by Transmission Estimation from Real-World Hazy Scenes



Lightweight and Efficient Image Dehazing Network Guided by Transmission Estimation from Real-World Hazy Scenes

- Transmission-guided lightweight neural network called TGL-Net is proposed for efficient image dehazing.
- Both natural images and synthetic datasets are used for training the TGL-Net to make the model more applicable to real-world image dehazing and to achieve more rapid convergence during the training process.
- based on Residual encoder-decoder network.
- divided into 3 phases.
- downsampling, encoder–decoder, and upsampling.

Lightweight and Efficient Image Dehazing Network Guided by Transmission Estimation from Real-World Hazy Scenes

- Down sampling : image features extracted from the convolutional layer, and a maximum pooling operation
- encoder–decoder connection with three pairs of convolutional and deconvolutional layers as the main phase of the proposed TGL-Net for feature extraction and transmission estimation.
- In the encoder, convolutional layers are used to extract image features and eliminate noise simultaneously.
- In the decoder, deconvolutional layers are used to recover the details of transmission maps.
- Upsampling:The purpose of upsampling is to enlarge the transmission map to the same size as that of the input image.

Problem Definition

- Design and develop a GAN-based single Image dehazing model

Objective

- Design and develop a GAN based model for image dehazing
- Evaluate the model using various existing datasets

References

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Thank You