



IMAGE DEHAZING FOR AUTONOMOUS DRIVING IN INCLEMENT WEATHER CONDITIONS

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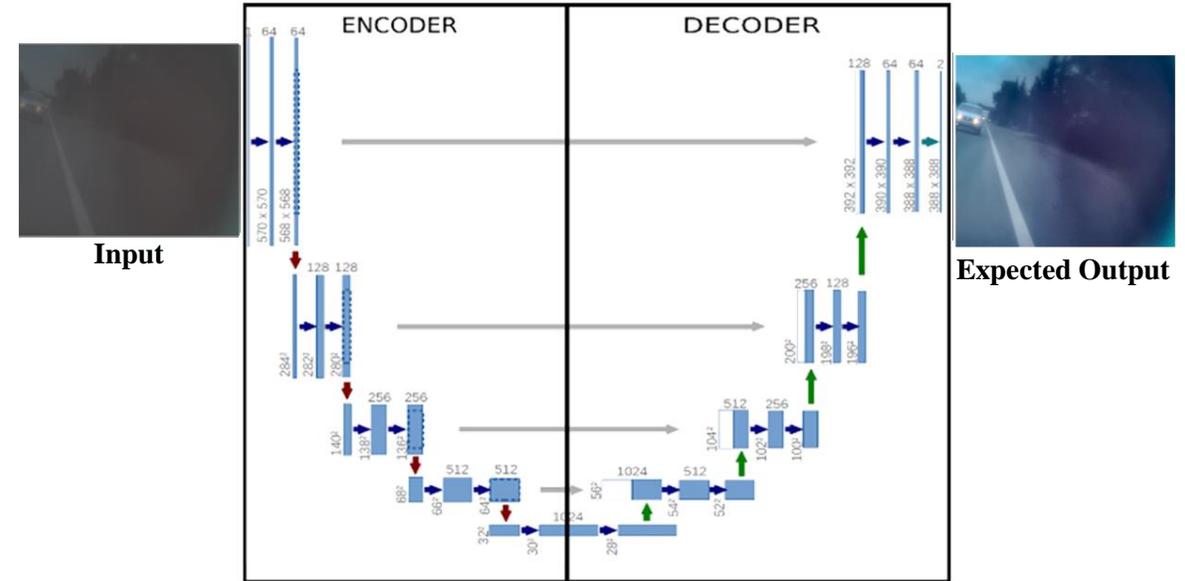
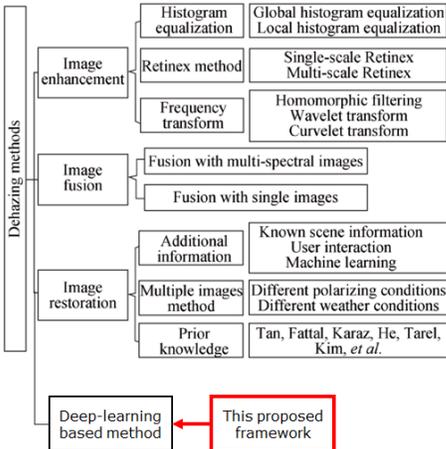
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I. Objectives

According to recent studies and data analysis there have been major road accidents that have taken place around the world causing the loss of human life which list bad weather conditions and low visibility as their root cause. Our method proposes a new framework to de-haze/de-fog a hazy/foggy image by applying the concepts of deep neural networks. The main objective of this proposal is to design and train a model based on our **newly collected dataset**, developing a set of algorithms and techniques to as accurately as possible to dehaze/defog an image. This is a part of our large project dubbed “Image De-Things” which includes image dehazing, image de-fencing, image defogging, image de-glassing. Note that this proposed project is a part of my Master’s thesis.



Above: Differences between hazy and haze free images in different scenes. Below: review of recent advances in the field



Above: A basic model of a U-Net used for image denoising.

II. Significance

In recent years, research into autonomous vehicles has received substantial attention which has accelerated the development and adaptation of these vehicles in our day to day world. However, there are still major pitfalls that need to be solved before these vehicles are to become fully driverless on public streets. These self-driving vehicles use image recognition algorithms that have been trained to detect objects such as streets, stop signs, and people. However, in bad weather conditions, these objects become increasingly difficult to detect. As such, all things bad weather related with object detection and image segmentation are a major focus in research.

Imagine if you are driving in an adverse weather with a lot of snow to lessen your visibility of the surroundings, how do you drive without knowing what’s ahead? Therefore, this proposed work aims to solve these problems to help drive in adverse weather conditions. Image dehazing also plays an important role in climatology, environmental perception wild life monitoring and conservation, surveillance systems, object detection and recognition. The proposed work will provide more opportunities to explore different models in the field of image de-noising.