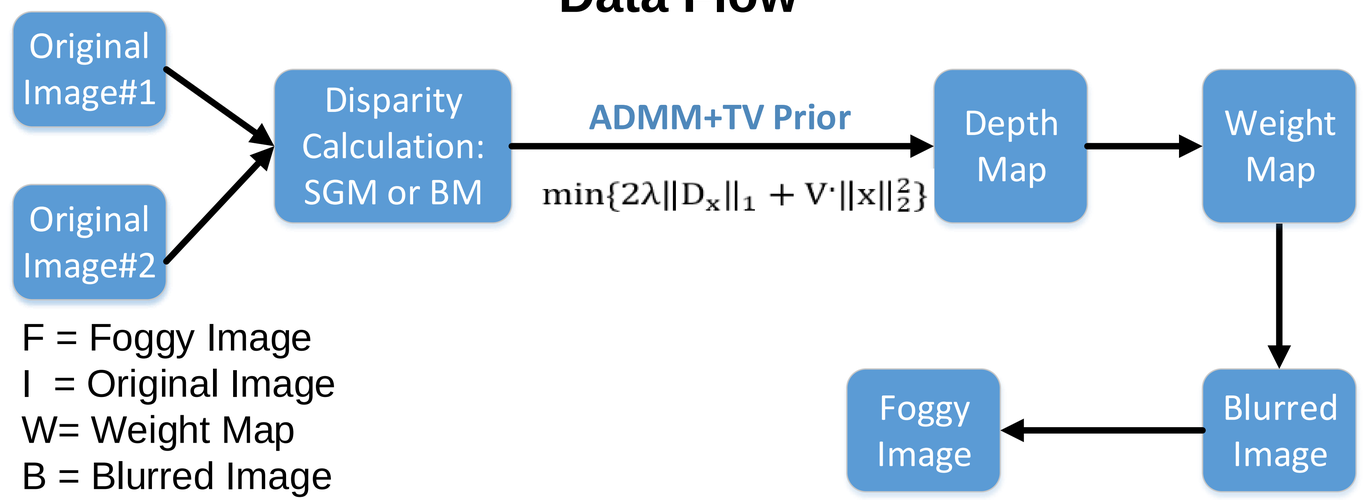
Depth Estimation and disruption Simulation

Hilel Polak
Stanford University

Motivation

One of the most important aspects of computer vision is depth estimation.
It gains more importance since more applications need this ability.
One aspect of this is simulation of fog or smoke. Realistic fog simulation depends on the depth of objects in the scene, among other factors. In this project, I construct a pipeline to estimate depth, blur and brighten the target image, and use this to construct a foggy version.

Data Flow



F = Foggy Image
I = Original Image
W= Weight Map
B = Blurred Image
C = Fog Constant

$$F(x) = W(x)\cdot\{C\cdot(1-\alpha) + \alpha\cdot B(x)\} + I(x)\cdot\{1 - W(x)\}$$

Related Work

- Depth estimation based on multiple images or a video
- Fog simulation and rendering
- Dehazing based on single image

References

[1] Sun Kong He Tian, An Algorithm of imaging simulation of fog with different visibility, 2015
[2] Guo Tang Xiao, Foggy Scene Rendering Based on Transmission Map Estimate, 2014
[3] Wahlberg Bo, An ADMM algorithm for a class of total variation regularized estimation problems, 2012

Experimental Results