REMOVAL OF FOG FROM IMAGES

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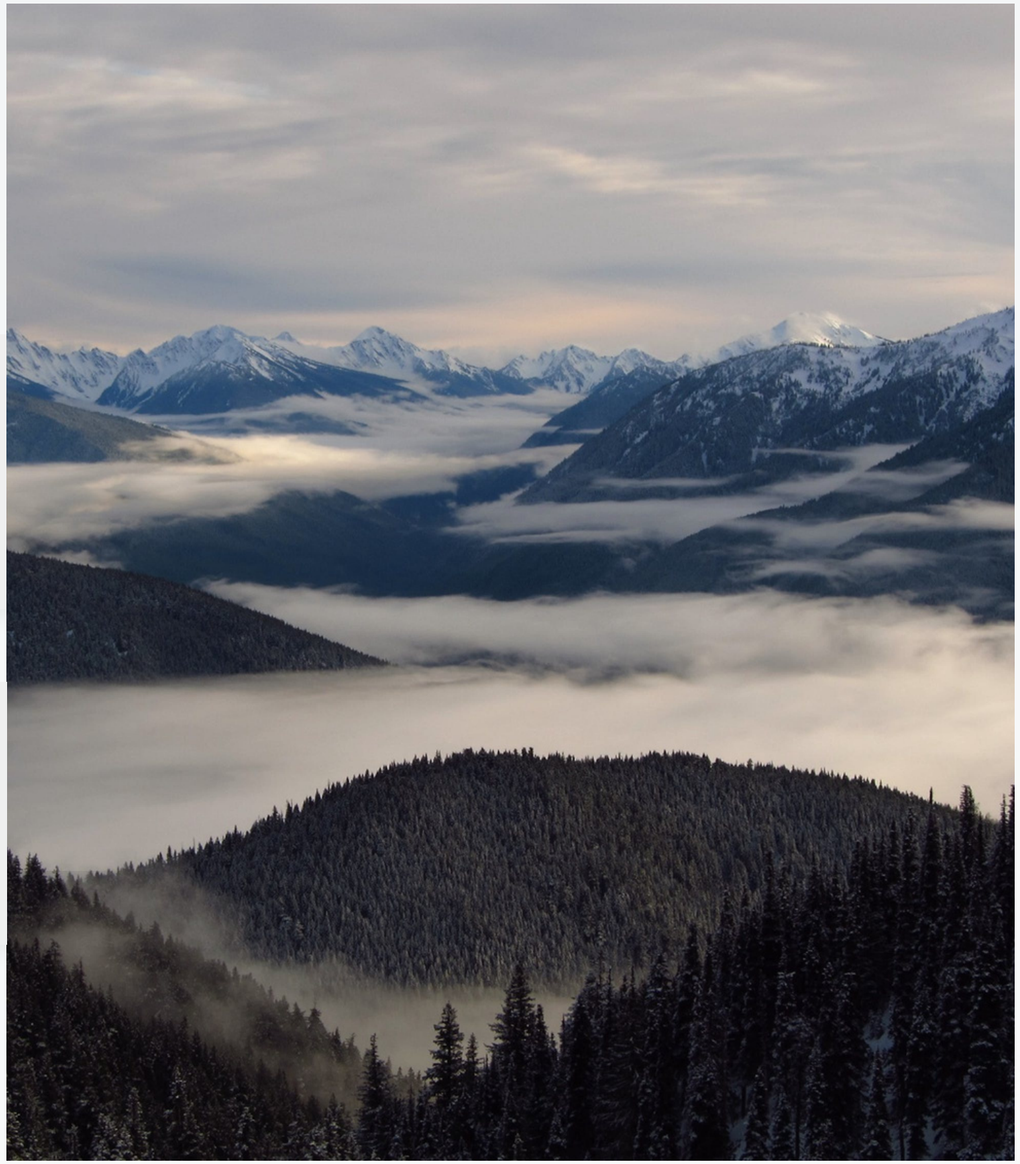
CONTENT

OUTLINE

Poor weather makes it harder to see the atmosphere. Low visibility reduces the effectiveness of image processing algorithms including tracking, surveillance, and navigation as well as the quality of perceptual images.

This process aims to restore details, colors, and contrast that may be obscured by the presence of fog



MOTIVATIONS

motivation n° 1

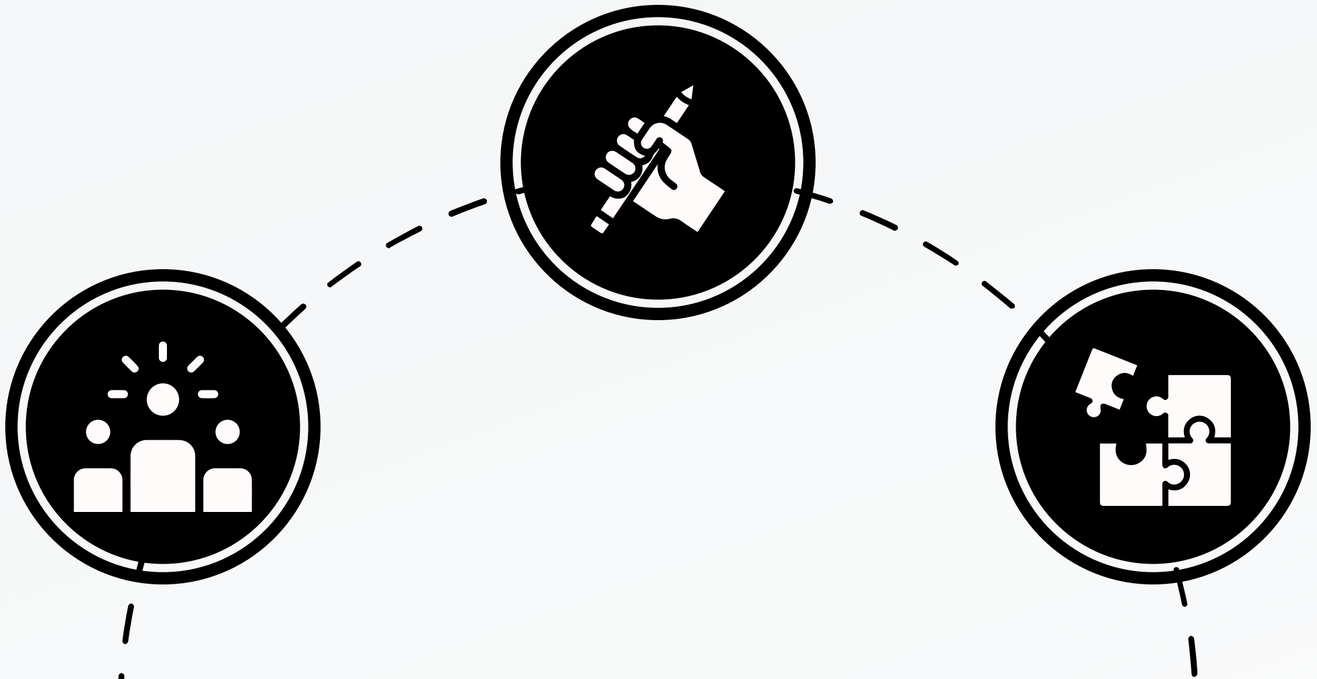
Enhanced Visibility and Clarity.

motivation n° 2

Improved Safety

motivation n° 3

Security and Surveillance



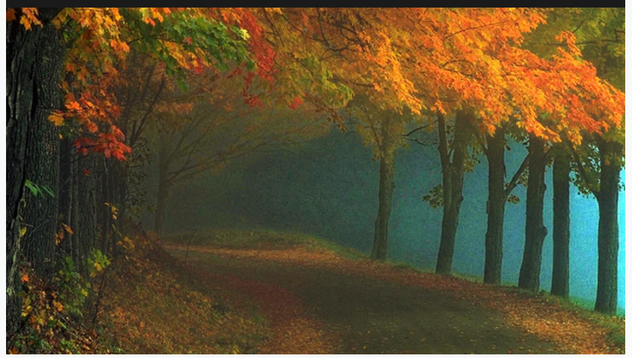
OBJECTIVE

BEFORE

- To enhance the safety of various applications, such as autonomous driving, aviation, and maritime navigation, by providing clearer and unobstructed views of the environment.
- To restore obscured details, objects, and scenes, making them more visible and discernible in the presence of fog. This is especially important in applications like surveillance, transportation, and outdoor photography.

- To improve the effectiveness of surveillance and security systems by providing clear and unobstructed views, making it easier to detect and identify objects and individuals.
- To develop efficient fog removal methods suitable for real-time and dynamic scenarios, such as in self-driving cars, where quick decision-making based on clear vision is essential.

AFTER



INTRODUCTION

In image processing, fog reduction is a game-changing technique that cuts through the haze and mist that obscures the image. It uses sophisticated algorithms to improve visibility, bring back colours, and bring out details in photos that are obscured. This innovation makes sure that the beauty of the world is never obscured by fog in a variety of disciplines, including photography and transportation safety.

01

02

03

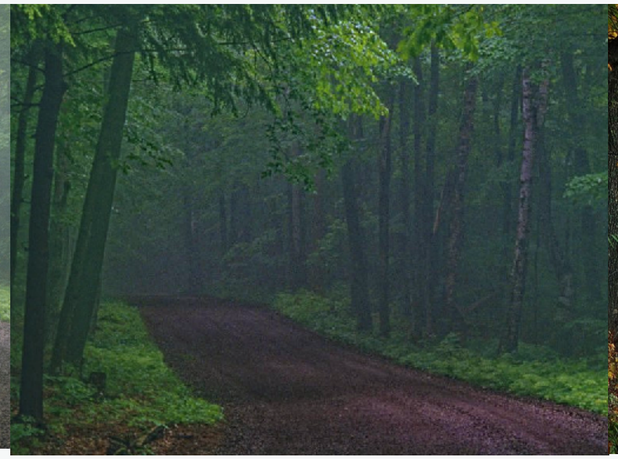
04

WORKDONE 1

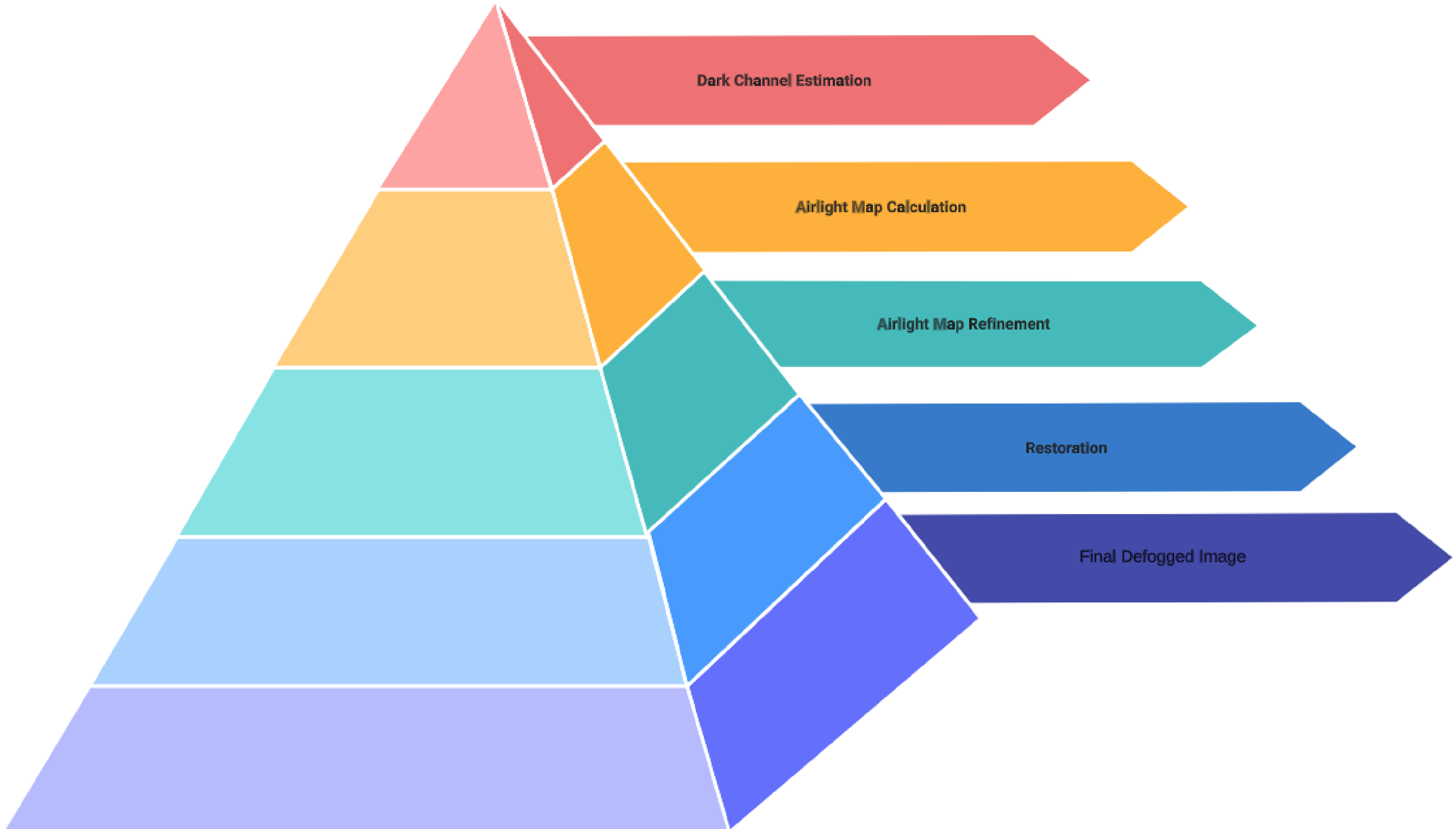
W1

WORKDONE2

W2



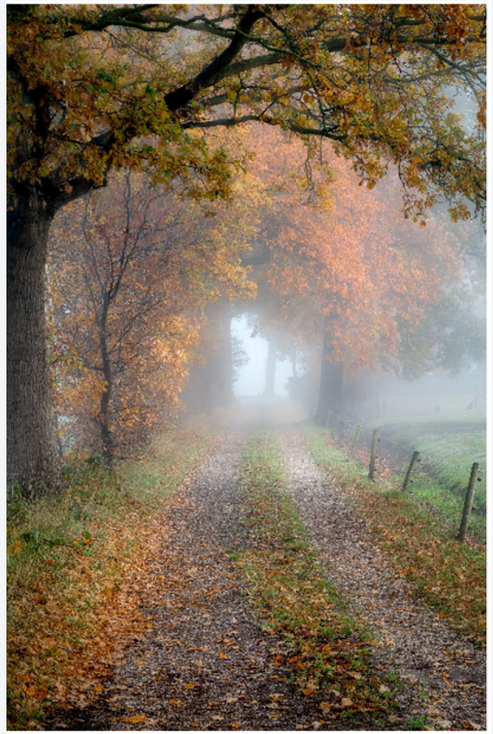
FLOWCHART


Dark Channel Estimation
Airlight Map Calculation
Airlight Map Refinement
Restoration
Final Defogged Image

WORKDONE

- Dark Channel Estimation: The pixels that represent the non-sky region of an image have low intensities in at least one color component. The channel formed by these low intensities is called the dark channel. In a normalized, fog-free image, the intensity of dark channel pixels is very low, nearly zero. In a foggy image, the intensity of dark channel pixels is high, because they are corrupted by fog. So, the fog removal algorithm uses the dark channel pixel intensities to estimate the amount of fog.
- Estimating the transmission map that represents the degree of haze in different parts of the image is another significant computational task. Various algorithms, such as dark channel prior and guided filter, are used for this purpose
- Restoration: To reduce over-smoothing effects, this stage corrects the filtered image using these equations. The constant, , represents the mid-line of changing the dark regions of the airlight map from dark to bright values

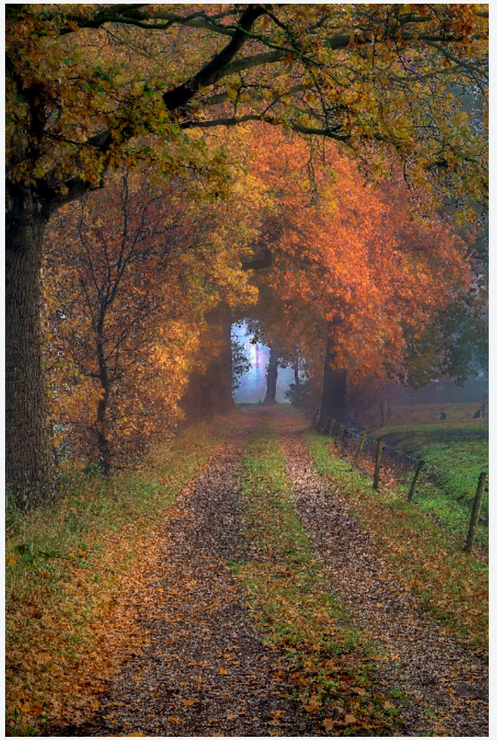
input image



Constraint Bounded Dark Channel Prior Image

Transmission Map

Final Defogged Image



RESULT

FOGGY IMAGE

DEFOGGED IMAGE

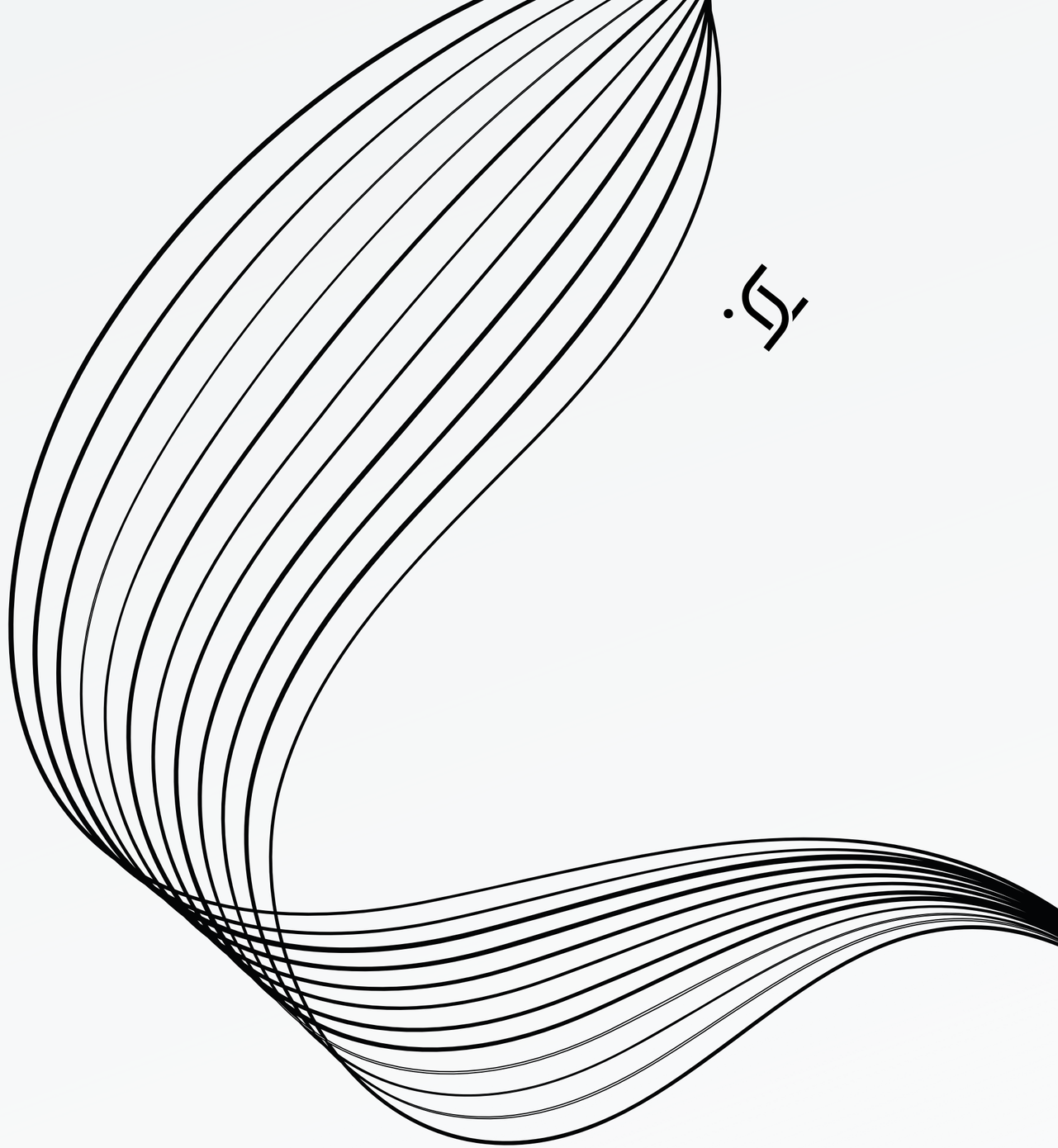
CONCLUSION

- There are many uses for a fog removal algorithm in consumer electronics, entertainment, and tracking and navigation.
- Fog removers are essential for enhancing visibility in various settings, such as on windshields, eyewear, camera lenses, and security cameras. They help prevent accidents and ensure safety.
- We also use the algorithm of a fog remover in addition to estimating the dark channel and calculating the air light map.

REFERENCES

- Abhishek Kumar Tripathi & Sudipta Mukhopadhyay (2012) Removal of Fog from Images: A Review, IETE Technical Review, 29:2, 148-156
- Matlab Fog Rectification https://in.mathworks.com/help/visionhdl/ug/fog-rectification.html

THANK YOU



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