

CONCLUSION

This report has shown how reconstruction is being used in the removal of degradations from images, more particularly in the removal of defects like line scratches, semi-transparent blotches, cracks, spots, blotches or even unwanted objects from images. All the methods that were implemented required manual defect detection but the actual restoration process is fully automatic for semi-transparent blotch and line restorations. For the image noise removal technique, the restoration process is semi-automatic, in the sense that the user needs to provide some hints for correcting the defects but it allows some flexibility to the user in providing those hints.

Concerning implementation, all three techniques were implemented so as to reduce execution time as much as possible, especially in the case of the image noise removal method, without affecting the robustness of the methods. However, these optimizations in coding has led to additional image processing, thus leaving less time to consider other methods that could remove more degradations from images.

All techniques presented in this report can be improved by integrating an automatic detection of the defect(s). This will further reduce user involvement - this advantage can be used in the restoration of movie frames where it would be tedious for a user to identify defects on each frame since a movie can consist of thousands of frames. This would also mean that the user would not need to select which method to apply on a defect since the defect would automatically be recognized and the appropriate restoration method would thus be applied automatically.

Much effort has been invested in designing a graphical interface that enables the user to select the defects or to provide hints for correction directly on the screen itself. This interface can be further improved through additional features. These include the selection of subimages of any size when choosing repair and sample subimages, and not restricted to powers of two as it is the case in this project. Furthermore, the possibility of choosing subimages of different shapes according to the information available would be an advantage in cases where the background is structured.

All three techniques have used only color in the restoration process, but the use of other image descriptors like texture or shape is also possible and may help to improve results in cases where the techniques presented in this report do not perform well. The use of more complex mathematical models to model the degradation and restoration can also help in these cases.