Activities concern several aspects of digital film restoration, including the analysis of issues related to the problem, ranging from the kind of different defects, to their causes, and to methods and algorithms for their removal. Particular attention is given to some specific types of defects that can affect digital image sequences and to methodologies adopted for their management, devising new machine learning based algorithms and methodologies for their removal. Defects taken into consideration include dust and dirt and linear scratches.

We have proposed methods for automatic removal of linear scratches in digital image sequences, based on the idea of adopting an image model as simple as possible, evaluate the displacement of such model from the real model, and correct scratch removal through the addition of the computed displacement.

Moreover, we devised a method for the detection and the removal of linear blue scratches that affect also modern color movies, based on specific characteristics of such kind of defect.

We also proposed a new methodology for the solution of classes of problems related to digital film restoration that is well suited for implementation into high-performance parallel and distributed computing environments. The basic idea is to adopt several well settled algorithms for the class of problems at hand, and to combine obtained results through the adoption of suitable image fusion techniques, with the aim of taking advantage of adopted algorithms potentialities and at the same time reducing their disadvantages.

Finally, for dust and blotch removal, a novel approach was envisaged, based on viewing the problem as one of separating overlapping images, and then reformulating it as a Blind Separation problem, approached through Independent Component Analysis techniques. See links to: - GC06BlueScratches : Page created in order to show the images used for testing of the blue scratch detection and removal algorithms presented in **[7]** and **[8]** . -

BlueScratches

: Page created in order to show the images used for testing of the blue scratch detection and removal algorithms presented in **[8]** . -

DataFusionScratches

: Page created in order to show the images used for testing of the scratch detection and removal algorithm presented in **[9]** .

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