LEARNING DEFECTS IN OLD MOVIES FROM MANUALLY ASSISTED RESTORATION

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1. CONTEXT

The detection of defects in old movies is taking part into a bigger framework including video inpainting [2] for movie restoration.



The detection of these defects is proceeded from a specific dataset, which is a movie restored by an expert of the Cinémathèque de Toulouse, with the help of the specialized software DIAMANT-Film.



3. NETWORK ARCHITECTURE

The architecture of our network is based on the U-net model developed in [3], with 3 frames as input and 7 layers.



The loss function we used for the training of the network is the opposite of the Dice coefficient [1]:

$$\text{Loss}\left(y_{_{C}},y_{_{U}}\right) = -\frac{2\sum_{i,j}y_{_{C}}(i,j)y_{_{U}}(i,j)}{\sum_{i,j}y_{_{C}}(i,j) + y_{_{U}}(i,j)} \in [-1,0]$$

2. MASK CREATION

The masks of the localization of the defects are often inaccessible because they are intermediate variables hidden in the restoration software, so a first estimation of them had to be made.



REFERENCES

[1] L. R. DICE, Measures of the Amount of Ecologic Association between Species, Ecology, 26 (1945).

- [2] A. RENAUDEAU, F. LAUZE, F. PIERRE, J.-F. AUJOL, AND J.-D. DUROU, Alternate Structural-Textural Video Inpainting for Spot Defects Correction in Movies, in Proceedings of SSVM 2019.
- [3] O. RONNEBERGER, P. FISCHER, AND T. BROX, U-net: Convolutional Networks for Biomedical Image Segmentation, in Proceedings of MICCAI 2015, vol. 9351 of LNCS.