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CSCI3401: Senior Seminar

Presentation Outline

1. Overview
   1. Why? (1 minute) – why is digital art restoration done
   2. Outline (30 seconds) – summary of contents of presentation
2. Edge Detection
   1. Criteria (30 seconds) – discuss accuracy, localization, and uniqueness
   2. Process (2 minutes) – briefly describe functionality of Canny algorithm (Gaussian filter, gradient, and thresholds)
3. Morphological Operations
   1. Terminology and Basic Functionality (2 minutes) – explain input and structuring element
   2. Erosion (2 minutes) – explain erosion
   3. Dilation (2 minutes) – explain dilation
   4. Opening (1 minute) – explain opening
   5. Closing (1 minute) – explain closing
4. Methods of Crack Detection
   1. Top-Hat Transform (3 minutes) – discuss black, white, and multiscale top-hat transforms (note that black and white top-hat will be condensed, and multiscale may be cut entirely, as there is no quantitative data available and time is limited)
   2. Alternative Method (3 minutes) – discuss alternative (crack mask, edge mask, and loss of edge information of union by erosion)
5. Inpainting (2 minutes) – briefly describe functionality if inpainting (division of painting into neighborhoods and regions, select defective pixel, determine context, comparison of context to other neighborhoods by sum of squared differences, and replacement of defective pixels)
6. Results
   1. Terminology (2 minutes) – explain true positives, false positives, true negatives, false negatives, false positive rate, true positive rate/recall, and precision
   2. Comparison on Performance of Top-Hat Transform and Alternative (2 minutes) – compare the results of the two methods
7. Conclusions
   1. Summarize (30 seconds) – summary of contents of presentation and specifically results
   2. Further Study (1 minute) – areas of further study in the area of digital art restoration