Computational methods of restoration quality assessment

Image quality assessments are part of the quality of experience measures and are a hot topic in image enhancement and image processing techniques. Image quality metrics are useful for the evaluation of the error introduced by a specific process, or the enhancement of an algorithm. Image luminance, contrast, colour distribution, smoothness, presence of noise or of geometric distortions are some examples of low level cues usually contributing to image quality. Aesthetic canons and trends, displacement of the objects in the scene, significance and message of the imaged visual content are instances of the high level (i.e. semantic) concepts that may be involved in image quality assessment

To this aim, low-level IQ metrics aim to compute difference from a reference and a distorted image, but high-level metrics must include in their computation a model of Human Visual System (HVS). In this context, different metrics try to simulate some behaviour of the HVS and try to give a definition of quality based on some specific vision features, but until today no one metric can include all the complexities of the vision.

An application of particular interest for image quality is film restoration where filo-logical constraints and lack of reference aim are a difficult challenge for automatic evaluation. However, the world of film restoration is subject to a fast-technical growth that makes the application of image quality metrics mandatory.

Aiming to provide a overview of the existing image quality metrics assessments, in our work we want to analyse the limits and the challenges of the use of different image quality metrics on restored film frames. In this presentation we describe the main methods used in film restoration to assess the quality of a frame/film enhancement and the most used methods to quantify the quality of an image. Different results will be reported, and the first solutions of our research will be presented.

Outilne

1. **What is quality?**
2. **Image Quality Metrics**
3. **Quality assessment in film restoration**
4. **Application:**

   Application of IQ objective assessments in film frames restored through a classic restoration workflow and through SCAs.
5. **Presentation of the results**
6. **Discussion**
7. **Future Work**

Biography

Alice Plutino
Alice Plutino is a PhD student in Computer Science at the University of Milan. She received her Bachelor and her Master degree in Conservation and Diagnostic of Cultural Heritage. Her current field of research is colorimetry for cultural heritage and digital movie restoration. She's also interested in image quality metrics, digital color and algorithms for image enhancement.