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Nota di contenuto	Digital Video Quality; Contents; About the Author; Acknowledgements; Acronyms; 1 Introduction; 1.1 Motivation; 1.2 Outline; 2 Vision; 2.1 Eye; 2.1.1 Physical Principles; 2.1.2 Optics of the Eye; 2.1.3 Optical Quality; 2.1.4 Eye Movements; 2.2 Retina; 2.2.1 Photoreceptors; 2.2.2 Retinal Neurons; 2.3 Visual Pathways; 2.3.1 Lateral Geniculate Nucleus; 2.3.2 Visual Cortex; 2.4 Sensitivity to Light; 2.4.1 Light Adaptation; 2.4.2 Contrast Sensitivity; 2.5 Color Perception; 2.5.1 Color Matching; 2.5.2 Opponent Colors; 2.6 Masking and Adaptation; 2.6.1 Spatial Masking; 2.6.2 Temporal Masking 2.6.3 Pattern Adaptation2.7 Multi-channel Organization; 2.7.1 Spatial Mechanisms; 2.7.2 Temporal Mechanisms; 2.8 Summary; 3 Video Quality; 3.1 Video Coding and Compression; 3.1.1 Color Coding; 3.1.2 Interlacing; 3.1.3 Compression Methods; 3.1.4 Standards; 3.2 Artifacts;

3.2.1 Compression Artifacts; 3.2.2 Transmission Errors; 3.2.3 Other Impairments; 3.3 Visual Quality; 3.3.1 Viewing Distance; 3.3.2 Subjective Quality Factors; 3.3.3 Testing Procedures; 3.4 Quality Metrics; 3.4.1 Pixel-based Metrics; 3.4.2 Single-channel Models; 3.4.3 Multi-channel Models; 3.4.4 Specialized Metrics
 3.5 Metric Evaluation3.5.1 Performance Attributes; 3.5.2 Metric Comparisons; 3.5.3 Video Quality Experts Group; 3.5.4 Limits of Prediction Performance; 3.6 Summary; 4 Models and Metrics; 4.1 Isotropic Contrast; 4.1.1 Contrast Definitions; 4.1.2 In-phase and Quadrature Mechanisms; 4.1.3 Isotropic Local Contrast; 4.1.4 Filter Design; 4.2 Perceptual Distortion Metric; 4.2.1 Metric Design; 4.2.2 Color Space Conversion; 4.2.3 Perceptual Decomposition; 4.2.4 Contrast Gain Control; 4.2.5 Detection and Pooling; 4.2.6 Parameter Fitting; 4.2.7 Demonstration; 4.3 Summary; 5 Metric Evaluation
 5.1 Still Images5.1.1 Test Images; 5.1.2 Subjective Experiments; 5.1.3 Prediction Performance; 5.2 Video; 5.2.1 Test Sequences; 5.2.2 Subjective Experiments; 5.2.3 Prediction Performance; 5.2.4 Discussion; 5.3 Component Analysis; 5.3.1 Dissecting the PDM; 5.3.2 Color Space; 5.3.3 Decomposition Filters; 5.3.4 Pooling Algorithm; 5.4 Summary; 6 Metric Extensions; 6.1 Blocking Artifacts; 6.1.1 Perceptual Blocking Distortion Metric; 6.1.2 Test Sequences; 6.1.3 Subjective Experiments; 6.1.4 Prediction Performance; 6.2 Object Segmentation; 6.2.1 Test Sequences; 6.2.2 Prediction Performance
 6.3 Image Appeal6.3.1 Background; 6.3.2 Quantifying Image Appeal; 6.3.3 Results with VQEG Data; 6.3.4 Test Sequences; 6.3.5 Subjective Experiments; 6.3.6 PDM Prediction Performance; 6.3.7 Performance with Image Appeal Attributes; 6.4 Summary; 7 Closing Remarks; 7.1 Summary; 7.2 Perspectives; Appendix: Color Space Conversions; References; Index

Sommario/riassunto

Visual quality assessment is an interdisciplinary topic that links image/video processing, psychology and physiology. Many engineers are familiar with the image/video processing; transmission networks side of things but not with the perceptual aspects pertaining to quality. Digital Video Quality first introduces the concepts of human vision and visual quality. Based on these, specific video quality metrics are developed and their design is presented. These metrics are then evaluated and used in a number of applications, including image/video compression, transmission and watermarking.<u
