REDUCED REFERENCE IMAGE QUALITY ASSESSMENT FOR HIGH DYNAMIC RANGE BASED ON TONE-MAPPING OPERATOR

UNDERGRADUATE THESIS

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FACULTY OF ENGINEERING AND COMPUTER SCIENCE
BAKRIE UNIVERSITY
JAKARTA
2019

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Submitted as a partial fulfillment to obtain Bachelor Degree (S1) in Informatics Study Program, Bakrie University

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STATEMENT OF ORIGINALITY

The material in this Undergraduate Thesis is the final result of my own employment, all sources are quoted and cited properly.

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Jakarta, August 21th, 2019

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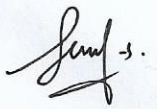

(Salmaa Badriatu Syafa'ah)

REDUCED REFERENCE IMAGE QUALITY ASSESSMENT FOR HIGH DYNAMIC RANGE BASED ON TONE-MAPPING OPERATOR

Salmaa Badriatu Syafaah [1]

Abstract

This thesis propose an objective image quality assessment for High Dynamic Range (HDR) images with reduced reference based on Tone Mapping Operator (TMO). As we know, HDR images can now be displayed on a standard device such as a smartphone. The valuation method here is classified as the Reduce-Reference (RR) method as only partial reference information is available. First, the TMO images and the reference images is extracted. Then, the images quality score is measured with the features extracted. This study use three main models i.e. Quality Assessment 1 (QA1), Quality Assessment 2 (QA2), and Quality Assessment 3 (QA3). To know how well this model, Pearson and Spearman correlation is applied. As the ground thruth data, public subjective score is utilized. The result show that feature combine is the best feature with QA1_Cubed as the highest correlation.

Keywords : Objective Quality Assessment, Tone Mapping Operator (TMO), Reduce-Reference (RR), High Dynamic Range (HDR)

[1]Undergraduate Student of Informatics Study Program, Bakrie University

Contents

List of Figures

List of Tables

List of Abbreviations

3D 3 Dimensional

BSQ Best subjective quality

DMOS Difference Mean Opinion Score

DSCQS Double-Stimulus Continuous Quality Scale

DSIS Double-Stimulus Impairment Scale

FR Full-Reference

FSIM Feature Similarity Index

HDR High Dynamic Range

HDRI High Dynamic Range Imaging

HIGRADE HDR Image GRADient Evaluator

HVS Human Visual System

JPEG Joint Photographic Experts Group

KRCC Kendall's Rank-order Correlation Coefficient

LIVE Laboratory for Image & Video Engineering

MAD Most Apparent Distortion

MEF Multi-Exposure Image Fusion

MOS Mean Opinion Score

MPEG Moving Pictures Experts Group

MS-SSIM Multiscale Structural Similarity Index

MSCN Mean-Subtracted-Contrast

MSE Mean Squared Error

NR No-Reference

NSS Natural Scene Statistics

PU Perceptually Uniform

QoE Quality of Experience

QoS Quality of Service

RR Reduce-Reference

SDR Standard Dynamic Range

SLR Single-Lens Reflects

SRCC Spearman's Rank-order Correlation Coefficient

SRP Scene Reproduction

SSIM Structural Similarity Index

TMO Tone Mapping Operator

TMQI Tone Mapped image Quality Index

UHD Ultra High Definition

VIF Visual Information Fidelity

VSS Visual System Simulator