

Information technology - Lossless and near-lossless compression of continuous-tone still images - Extensions

CONTENTS		<i>Page</i>
1	Scope	1
2	Normative references	1
2.1	Identical Recommendations International Standards	1
2.2	Additional references	1
3	Definitions, abbreviations, symbols and conventions	2
3.1	Definitions.....	2
3.2	Abbreviations.....	2
3.3	Symbols.....	2
4	General	3
4.1	Extensions specified by this Recommendation International Standard	4
4.1.1	Encoding with arithmetic coding	4
4.1.2	Extension of near-lossless coding	4
4.1.3	Extension of prediction	5
4.1.4	Extension of Golomb coding	5
4.1.5	Fixed length coding.....	5
4.1.6	Sample transformation for inverse colour transforms	5
4.2	Descriptions of extended functions	5
5	Interchange format requirements.....	6
6	Encoder requirements.....	6
7	Decoder requirements.....	6
8	Conformance testing for extensions	7
8.1	Purpose.....	7
8.2	Encoder conformance tests.....	7
8.3	Decoder conformance tests	7
Annex A – Encoding procedures with arithmetic coding for a single component.....		10
A.1	Coding parameters and compressed image data.....	10
A.2	Initializations and conventions.....	10
A.2.1	Initializations.....	10
A.2.2	Conventions for figures.....	12
A.3	Context determination.....	12
A.3.1	Local gradient computation.....	12
A.3.2	Flat region detection.....	13
A.3.3	Local gradient quantization.....	13
A.3.4	Quantized gradient merging	14
A.3.5	Adjustment of error tolerance for near-lossless coding with visual quantization.....	14
A.4	Prediction	14
A.4.1	Edge-detecting predictor	14
A.4.2	Prediction correction.....	14
A.4.3	Computation of prediction error.....	15
A.4.4	Error quantization for near-lossless coding, and reconstructed value computation	16
A.4.5	Modulo reduction of the prediction error	16
A.5	Prediction error encoding	16
A.5.1	Error mapping	17
A.5.2	Binarization of MErrval with the Golomb code tree.....	17
A.5.3	Mapped-error encoding	18
A.6	Update variables.....	18
A.6.1	Update	18
A.6.2	Bias computation.....	21
A.7	Flow of encoding procedures	22

	<i>Page</i>
Annex B – Arithmetic coding	24
B.1 Arithmetic encoding procedures	24
B.1.1 Binary arithmetic encoding principles	24
B.1.2 Procedures of arithmetic coding	25
B.2 Arithmetic decoding procedures	28
B.2.1 Binary arithmetic decoding principles	28
B.2.2 Procedures of arithmetic decoding	28
Annex C – Encoding with arithmetic coding for multiple component images	30
C.1 Introduction	30
C.2 Line interleaved mode	30
C.2.1 Description	30
C.2.2 Process flow	30
C.3 Sample interleaved mode	30
C.3.1 Description	30
C.3.2 Process flow	31
C.4 Minimum coded unit (MCU)	31
Annex D – Extended functions for the baseline coding model	32
D.1 Extensions of near-lossless coding	32
D.1.1 Near-lossless coding with visual quantizaion	32
D.1.2 Near-lossless coding with NEAR value re-specification	32
D.2 Extensions of prediction on baseline coding model	33
D.2.1 Initializations	33
D.2.2 Prediction correction	33
D.2.3 Symbol packing	33
D.2.4 Update variables	34
D.2.5 Run interruption sample encoding	35
D.2.6 Flow of encoding procedures	35
D.3 Extension of Golomb coding	35
D.3.1 Golomb code completion	36
D.3.2 Run interruption handling for qbpp=1	36
Annex E – Fixed length coding	37
E.1 Introduction	37
E.2 Fixed length coding	37
Annex F – Sample transformation for inverse colour transform	38
F.1 Inverse colour transform	38
F.2 Example and guideline (Informative)	39
Annex G – Compressed data format	41
G.1 General aspects of the compressed data format specification	41
G.1.1 Marker assignments	41
G.1.2 JPEG-LS preset parameters specification syntax	41
Annex H – Control procedures for extensions	48
H.1 Control procedure for encoding a restart interval	48
H.2 Control procedure for encoding a minimum coded unit (MCU) with fixed length code (FLC)	48
Annex I – Conformance tests	51
I.1 Test images	51
I.1.1 Source images	51
I.1.2 Compressed image data	51
I.1.3 Test image formats	51
Annex J – Patents	53
J.1 List of patents	53
Annex K – Bibliography	55