AS/NZS 15938.3:2003
ISO/IEC 15938-3:2002

Australian/New Zealand Standard™

Information technology—Multimedia content description interface

Part 3: Visual

Standards Australia

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-001, Information Systems—Interconnection. It was approved on behalf of the Council of Standards Australia on 22 April 2003 and on behalf of the Council of Standards New Zealand on 22 April 2003. It was published on 2 June 2003.

The following are represented on Committee IT-001:

Australian Bureau of Statistics
Australian Communications Industry Forum
Australian Information Industry Association
Australian Telecommunications Users Group
Australian Vice-Chancellors Committee
Electrical Compliance Testing Association
Information Technology Association of New Zealand

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 03036.

Australian/New Zealand Standard™

Information technology—Multimedia content description interface

Part 3: Visual

First published as AS/NZS 15938.3:2003.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 5251 9

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-001, Information Systems—Interconnection. This Standard is identical with and has been reproduced from ISO/IEC 15938-3:2002, *Information technology—Multimedia content description interface,* Part 3: *Visual*.

The objective of this Standard is to provide a standardized set of technologies for describing multimedia content. It addresses a broad spectrum of multimedia applications and requirements by providing a metadata system for describing the features of multimedia content.

This Standard is Part 3 of AS/NZS 15938, *Information technology—Multimedia content description interface*, which, when complete, will consist of the following:

Part 1: Systems
Part 2: Description definition language
Part 3: Visual (this Standard)
Part 4: Audio
Part 5: Multimedia description schemes
Part 6: Reference software
Part 7: Conformance testing
Part 8: Extraction and use of MPEG-7 descriptions

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this part of ISO/IEC 15938’ should read ‘this part of AS/NZS 15938’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

CONTENTS

Page

Page

AUSTRALIAN/NEW ZEALAND STANDARD

Information technology — Multimedia content description interface —

Part 3: Visual

1 Scope

1.1 Organization of the document

The structure of this document is as follows. Clauses **2**-**4** specify the terms, abbreviations, symbols and conventions used throughout the document. Clauses **5**-**11** contain definitions of the description tools standardized by 15938-3 grouped by the visual features they are associated with, starting with basic structures and containers in Clause **5**, through color, texture, shape, motion, localization in Clause **10**. Clause **11** contains the remaining, unclassified items.

Each description tool is described by the following subclauses:

- Syntax: Normative DDL specification of the Ds or DSs.
- Binary Syntax: Normative binary representation of the Ds or DSs.
- Semantic: Normative definition of the semantics of all the components of the corresponding D or DS.

1.2 Overview of Visual Description Tools

This part of ISO/IEC 15938 specifies tools for description of visual content, including still images, video and 3D models. These tools are defined by their syntax in DDL and binary representations and semantics associated with the syntactic elements. They enable description of the visual features of the visual material, such as color, texture, shape and motion, as well as localization of the described objects in the image or video sequence. An overview of the visual description tools is shown in Figure 1.

The basic structure description tools include five supporting tools of visual descriptions defined in clauses **6**–**11**. They are categorized into two groups, descriptor containers and basic supporting tools. The former consists of three datatypes, GridLayout providing efficient representations of visual features on grids, TimeSeries representing temporal arrays of several descriptions, and MultipleView describing a 3D object using several pictures captured from different view angles. The latter contains two tools, Spatial2DCoordinateSystem used to specify the 2D coordinate system and TemporalInterpolation indicating the interpolation method between two samples on a time axis.

The remaining description tools, except for the FaceRecognition descriptor, are associated with visual features and are grouped into five feature categories: Color, Texture, Shape, Motion and Localization.

The color description tools include four color descriptors to represent different aspects of color features: representative colors (DominantColor), color distribution (ScalableColor), spatial distribution of colors (ColorLayout and ColorStructure). It also contains two supporting tools, ColorSpace and ColorQuantization used in DominantColor and an extension of ScalableColor to a group of frames or pictures (GoFGoPColor). All the color descriptors can be extracted from arbitrarily shaped regions.

The texture description tools facilitate browsing (TextureBrowsing) and similarity retrieval (HomogeneousTexture and EdgeHistogram) using the texture of a still or moving image region. All the texture descriptors can be extracted from arbitrarily shaped regions.

The shape description tools include two descriptors that characterize different shape features of a 2D object or region. The RegionShape descriptor captures the distribution of all pixels within a region and the Contour Shape descriptor characterizes the shape properties of the contour of an object. The Shape3D descriptor provides an intrinsic shape characterization of 3D mesh models.

The motion description tools include four descriptors that characterize various aspects of motion. The CameraMotion descriptor specifies a set of basic camera operations such as, for example, panning and tilting. The motion of a key point (pixel) from a moving object or region can be characterized by the MotionTrajectory descriptor. The ParametricMotion descriptor characterizes an evolution of an arbitrarily shaped region over time in terms of a 2D geometric transformation. Finally, the MotionActivity descriptor captures the pace of the motion in the sequence, as perceived by the viewer. All motion descriptors except for CameraMotion can be extracted from arbitrarily shaped regions.

The localization description tools can be used to indicate regions of interest in the spatial (RegionLocator) and spatio-temporal (SpatioTemporalLocator) domains.