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Part 5: Gesture Interface Markup Language (GIML)

Technologies de l'information — Interface utilisateur — Interfaces fondées sur la gestuelle entre dispositifs et méthodes —

Partie 5: Langage de balisage de l'interface gestuelle (GIML)

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Foreword

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

A list of all parts in the ISO/IEC 30113 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides definition, syntax, structure and explanation of GIML (Gesture Interface Markup Language) which is used to formally describe gestures for gesture-based interfaces of ICT products, systems and services. The gestures are recognized by the gesture software for the gesture-based interfaces and translated into corresponding gesture commands of the ICT products, systems and services. Some examples of the gestures are defined in international standards such as ISO/IEC 30113-1 and ISO/IEC 30113-11.

GIML is defined in terms of XML (Extensible Markup Language) which is a special subset of SGML (Standard Generalized Markup Language). It is useful in exchanging data in various ICT products and services and used to describe syntax and features of the standard gestures.

GIML is designed to achieve the following goals:

— The standard gestures are formally and consistently defined in a well-formed format.

— The standard gestures are concretely expressed as both human-readable and machine-readable.

— The information of the standard gestures is exchanged and shared among ICT products, systems and services.

This document focuses on the syntax and the structure of GIML. The XML schema of GIML is presented in Annex A. Some examples of GIML are listed in Annex B.

Information technology — User interface — Gesture-based interfaces across devices and methods —

Part 5:
Gesture Interface Markup Language(GIML)

1 Scope

This document defines GIML (Gesture Interface Markup Language). The syntax and the structure of GIML are described in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 30113-1, *Information technology — User interface — Gesture-based interfaces across devices and methods — Part 1: Framework*

ISO/IEC 30113-11, *Information technology — Gesture-based interfaces across devices and methods — Part 11: Single-point gestures for common system actions*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 General

GIML is used to describe syntax and features of gestures which support interactions between human users and gesture interfaces of ICT product, systems and services. The gesture interfaces provide information and controls for the users to accomplish specific tasks as defined in ISO/IEC 30113-1. They include mice, touch screens, 3D mice, joysticks, game controllers, wired gloves, depth-aware cameras, stereo cameras, etc.

The gestures of the users are translated into gesture commands for the ICT product, systems and services. According to ISO/IEC 30113-1, gesture software implements functionalities of the gesture interfaces including gesture recognition, command processing and feedback generation. Some of the standard gestures are single-point gestures for common system actions as defined in ISO/IEC 30113-11.

Since GIML is used to describe syntax, structure and schema (as specified in Annex A) of the standard gestures in a well-formed format, the GIML-based descriptions are used in developing gestures, gesture interfaces, gesture software, etc. The GIML-based descriptions of the standard gestures can be understood by human and machines. Also, the description of the standard gestures can be utilized in exchanging and sharing information about the gestures.

5 Syntax and structure

5.1 General

The syntax and the structure of GIML are defined in this Clause. The GIML elements and the GIML attributes are defined. The elements are used to define gestures in a formal way. The attribute is used to present additional and more detailed information of its associated element.

5.2 Elements

5.2.1 General

The GIML element shall be defined using a start tag, an end tag and its content.

A start tag shall be defined as a string which is a concatenation of the symbol "<", the name of the element, optional attributes of the element, and the symbol ">".

An end tag shall be defined as a string which is a concatenation of the symbol "</", the name of the element, and the symbol ">". Every element with a start tag should end with an end tag.

The content of the element shall be located between a start tag and an end tag.

A GIML element with no content is termed as an empty element. An empty element can be represented in two ways as follows:

EXAMPLE 1 A start tag is immediately followed by an end tag.

```
<GIML> </GIML>
```

EXAMPLE 2 A complete empty tag is expressed without an end tag.


```
<GIML />
```

The following elements are defined in this document: <GIML>, <gesture>, <description>, <alternative>, <keyboard>, <mouse>, <range>, <minMovement>, <maxAngle>, <classification>, <xMovement>, <yMovement>, <zMovement>, and <commandInstance>.

5.2.2 The <GIML> element

The root element of GIML is annotated as "<GIML>". The <GIML> element holds a single type of a child element, i.e. the <gesture> element. The root element, <GIML>, shall not need any attribute. It shall not be a child of any other elements.

Annotation	GIML
Definition	The root element of a GIML document
Children	<gesture>
Attributes	None
Occurrence	1 This is the root element

EXAMPLE The root element, <GIML>, in the example contains the <gesture> element.

```
<GIML>
    <gesture> </gesture>
</GIML>
```


5.2.3 The <gesture> element.

The <gesture> element defines a specific gesture and contains one or more children elements, i.e., <description>, <alternative>, <range>, <classification>, and <commandInstance>.

Annotation	gesture
Definition	Specific gesture
Children	<description>, <alternative>, <range>, <classification>, <commandInstance>
Attributes	Required: "id", "name"
Occurrence	1 or more in the <GIML> element

EXAMPLE The “Left” gesture is specified using the <gesture> element. As defined in ISO/IEC 30113-11, its name is "Left" and its "id" is "G11-1".

```
<gesture id="G11-1" name="Left">
</gesture>
```

5.2.4 The <description> element

The <description> element explains the characteristics of the gesture. The element shall not have any child element. It has two attributes: the “desc” attribute and the “figure” attribute.

Annotation	description
Definition	Explanation of the characteristics of the gesture
Children	None
Attributes	Required: "desc" Optional: "figure"
Occurrence	1 or more in the <gesture> element

EXAMPLE The <description> element is used to explain feature of the “Left” gesture. It is explained in the “desc” attribute of the <description> element. The term, "POI" in the example, stands for a "point of interest" as defined in ISO/IEC 30113-11. The "figure" attribute is optional and specifies that the "Left" gesture is illustrated using a figure in the file named “left.png” as shown in Figure 1.

```
<gesture id="G11-1 " name="Left">
        <description desc ="a gesture of moving a POI horizontally along a left distance."
                figure="left.png" />
</gesture>
```

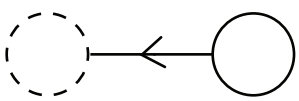

Figure 1 — "Left" gesture stored in a file named as "left.png"

5.2.5 The <alternative> element

Most standard gestures are naturally performed using a touch screen, a pen, a finger or a hand. There exist alternative ways to formulate the gestures using a different input device and/or a different method. A gesture command which is associated with a standard gesture shall be as same as the gesture command which is associated with the gesture generated by the alternative way. The <alternative> element describes the alternative way of performing a gesture using conventional input devices such as a mouse or a keyboard. The element should contain the <mouse> element or the <keyboard> element.

Annotation	Alternative
Definition	Alternative way of generating the gesture using a mouse or a keyboard
Children	<mouse>, <keyboard>
Attributes	None
Occurrence	1 or more in the <gesture> element

EXAMPLE The “Left” gesture is alternatively performed using a “left arrow key” of a keyboard.

```
<gesture id="G11-1 " name="Left">
    <alternative>
        <keyboard> left arrow key </keyboard>
    </alternative>
</gesture>
```


5.2.6 The <keyboard> element

The <keyboard> element describes an alternative way of creating a standard gesture using a keyboard which is regarded as a correspondence of the standard gesture.

Annotation	Keyboard
Definition	Alternative activity of generating the standard gesture using a keyboard
Children	None
Attributes	None
Occurrence	0 or more in the <alternative> element

EXAMPLE The “Up” gesture is alternatively performed by pressing an “up arrow” key of a keyboard.

```
<gesture id="G11-3 " name="Up">
    <alternative>
        <keyboard> up arrow key </keyboard>
    </alternative>
</gesture>
```


5.2.7 The <mouse> element

The <mouse> element describes an alternative action using a mouse.

Annotation	Mouse
Definition	Alternative activity of generating a gesture using a mouse
Children	None
Attributes	None
Occurrence	0 or more in the <alternative> element

EXAMPLE The “Backward” gesture can be alternatively performed by rotating a wheel of a mouse backward.

```
<gesture id="G11-6 " name="Backward">
    <alternative>
        <mouse> rotate a wheel of the mouse along a backward direction </mouse>
    </alternative>
</gesture>
```

5.2.8 The <range> element

The <range> element describes a range within which the movement is recognized as a specific gesture. The element may contain different child elements according to the gesture. The <range> element has several elements including the <minMovement> element and the <maxAngle> element.

Annotation	Range
Definition	Range of the allowed movement for the specific gesture
Children	<minMovement>, <maxAngle>
Attributes	None
Occurrence	1 or more in the <gesture> element

EXAMPLE The “Left” gesture would allow its POI movement of more than 30 pixels from the starting point of the gesture within the maximum angle of 30 degrees from the x-axis of the Cartesian coordinate system to be recognized as the standard “Left” gesture.

```
<gesture id="G11-1" name="Left">
        <range>
            <minMovement> 30 </minMovement>
            <maxAngle> 30 </maxAngle>
        </range>
</gesture>
```