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Information technology — JPSearch —

Part 2:

**Registration, identification and
management of schema and ontology**

**AMENDMENT 1: JPEG Ontology for
Image Description**

Technologies de l'information — JPSearch —

*Partie 2: Enregistrement, identification et gestion des schémas et
de l'ontologie*

AMENDMENT 1: Ontologie JPEG pour la description d'image

Reference number
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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

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Information technology — JPSearch —

Part 2:

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AMENDMENT 1: JPEG Ontology for Image Description

Page 1, Normative references

Add the following references at the end of Clause 2:

Internationalized Resource Identifiers (IRI), January 2005, Internet RFC 3987, available at <http://www.ietf.org/rfc/rfc3987.txt>

W3C OWL Working Group, OWL 2 Web Ontology Language: Document Overview, W3C Recommendation 27 October 2009, available at <http://www.w3.org/TR/2009/REC-owl2-overview-20091027/>

Resource Description Framework (RDF): Concepts and Abstract Syntax, W3C Recommendation 10 February 2004, available at <http://www.w3.org/TR/2004/REC-rdf-concepts-20040210>

W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes, W3C Recommendation 5 April 2012, available at <http://www.w3.org/TR/2012/REC-xmlschema11-2-20120405/>

Add the following Clauses after 7.10.4:

8 JPEG Ontology for Image Description (JPOno)

8.1 General

This Clause specifies the set of classes, properties, and restrictions that constitute the JPSearch Metadata Ontology (JPOno). This ontology specification provides the foundation to implement applications in different domains that can represent, exchange, and integrate digital image information generated in different systems and under different contexts.

JPOno users may only need to use parts of the entire ontology, depending on their needs and according to how much detail they want to include in their image information. For this, the JPOno terms (classes and properties) are grouped into two sub-vocabularies to provide an incremental introduction to the ontology.

- **JPOno-core:** A core vocabulary that acts as a central component to interconnect all the other sub-vocabularies.
- **JPOno-visual:** A rich set of constructs for semantic visual content description, including, but not limited to, a uniform description of identities, features, aspect, relationships, actions and emotional information of people appearing in the images, as well as description of events, locations and objects.

8.2 JPonto-core

8.2.1 Outline

A core vocabulary named JPonto-core is the basic set of entities and properties which serves as a central component to interconnect all the other sub-vocabularies of the JPEG Ontology for Image Description (JPonto). The following classes provide a basis for the rest of JPonto-core.

- **jponto:Image**: Represents a digital image.
- **jponto:RegionOfInterest**: A certain region within a digital image.
- **jponto:Agent**: An agent (e.g. person, group, software or physical artifact).

The primary classes relate to one another and to themselves using the properties shown in [Figure 1](#).

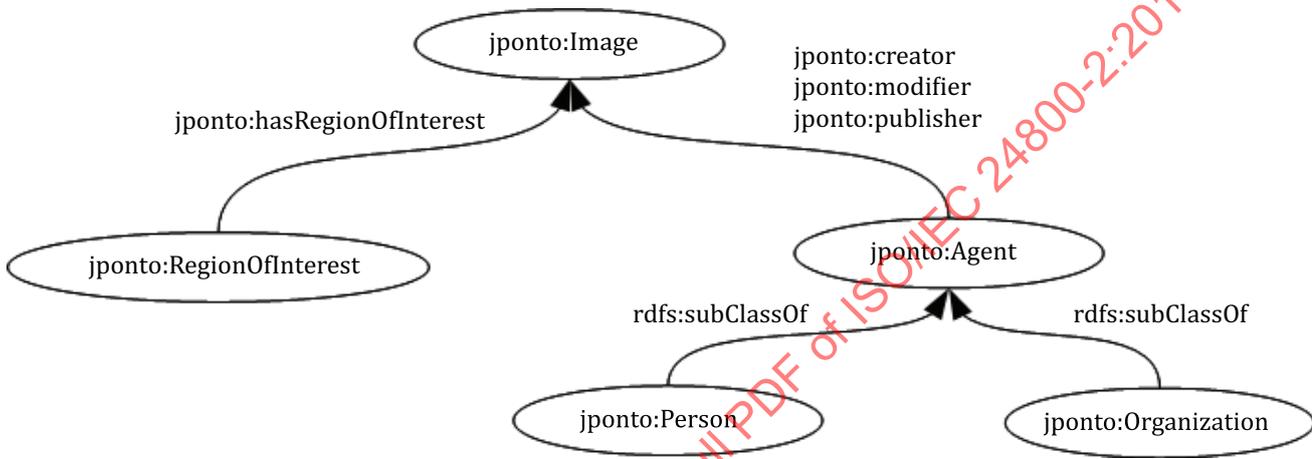


Figure 1 — Outline of JPonto-core

8.2.2 Example

This example shows a complete description of an imaginary image. It has a unique ID, a title and a creator.

```

@base <http://example.org/> .
@prefix jponto: <http://www.jpeg.org/ns/jponto#> .
<#image1> a jponto:Image;
  jponto:title "An example image";
  jponto:keyword "London";
  jponto:keyword "JPEG";
  jponto:creator [
    jponto:givenName "John";
    jponto:familyName "Smith";
    jponto:mbox <mailto:jsmith@example.com> ];
.
    
```

8.2.3 Semantics

8.2.3.1 JPonto-core class definitions (in alphabetical order)

| | |
|-----------------------------------|--|
| Class | jponto:Agent |
| Superclasses | — |
| IRI | http://www.jpeg.org/ns/jponto#Agent |
| Description | An agent (eg. person, group, software or physical artifact). |
| Described with properties: | |
| In range of | jponto:creator, jponto:modifier, jponto:publisher |
| Has subclasses | jponto:Organisation, jponto:Person |
| Syntax | <pre> :Agent a owl:Class; rdfs:comment "An agent (eg. person, group, software or physical artifact)."; </pre> |
| Example | (see examples for subclasses) |

| | |
|-----------------------------------|---|
| Class | jponto:Image |
| Superclasses | — |
| IRI | http://www.jpeg.org/ns/jponto#Image |
| Description | Represents a digital image |
| Described with properties: | jponto:creationDate, jponto:creator, jponto:depicts, jponto:description, jponto:GPSaltitude, jponto:GPSlatitude, jponto:GPSlongitude, jponto:hasRegionOfInterest, jponto:height, jponto:modifiedDate, jponto:modifier, jponto:publisher, jponto:title, jponto:width |
| In range of | — |
| Has subclasses | — |
| Syntax | <pre> :Image a owl:Class; rdfs:comment " Represents a digital image "; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:title "An example image"; . </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Organisation |
| Superclasses | jponto:Agent |
| IRI | http://www.jpeg.org/ns/jponto#Organisation |
| Description | Organisation or moral agent. |
| Described with properties: | jponto:name |
| In range of | jponto:creator, jponto:modifier, jponto:publisher |
| Has subclasses | — |
| Syntax | <pre> :Organisation a owl:Class; rdfs:comment "Organisation or moral agent"; rdfs:subClassOf :Agent ; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:hasCreatorPublisher [a jponto:Organisation; jponto:name "Example Company";]; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Person |
| Superclasses | |
| IRI | http://www.jpeg.org/ns/jponto#Person |
| Description | A physical person. |
| Described with properties: | jponto:familyName, jponto:givenName, jponto:mbox |
| In range of | jponto:creator, jponto:modifier, jponto:publisher, jponto:depicts |
| Has subclasses | — |
| Syntax | <pre> :Person a owl:Class; rdfs:comment "A physical person."; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:hasCreator [a jponto:Person; foaf:givenName "John Smith"; foaf:mbox <mailto:jsmith@example.com>]; </pre> |

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| | |
|-----------------------------------|---|
| Class | jponto:RegionOfInterest |
| Superclasses | jponto:Image |
| IRI | http://www.jpeg.org/ns/jponto#RegionOfInterest |
| Description | Represents a certain region within a digital image. |
| Described with properties: | jponto:boundingPolygon, jponto:depicts |
| In range of | jponto:hasRegionOfInterest |
| Has subclasses | — |
| Syntax | <pre> :RegionOfInterest a owl:Class; rdfs:comment "Represents a certain region within a digital image."; rdfs:subClassOf :Image; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:hasRegionOfInterest [jponto:boundingPolygon "0 0 100 100".]; . </pre> |

8.2.3.2 JPonto-core property definitions (in alphabetical order)

| | |
|------------------------------|--|
| Property | jponto:boundingPolygon |
| IRI | http://www.jpeg.org/ns/jponto#boundingPolygon |
| Description | Specifies the coordinates of the edges of the polygon enclosing a region in the form "x1,y1, x2,y2, x3,y3, ...". |
| Has super-properties: | — |
| Has domain | jponto:RegionOfInterest |
| Has range | xsd:string |
| Syntax | <pre> :boundingPolygon a owl:DatatypeProperty; rdfs:comment "Specifies the coordinates of the edges of the polygon enclosing a region in the form "x1,y1, x2,y2, x3,y3, ..."; rdfs:domain :Image ; rdfs:range xsd:string ; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . @prefix xsd: <http://www.w3.org/2001/XMLSchema#> . <#image1> a jponto:Image; jponto:creationDate "20 01-10-26T21:32:52"^^xsd:date; jponto:hasRegionOfInterest [jponto:boundingPolygon "0 0 100 100";] . </pre> |

| | |
|------------------------------|--|
| Property | jponto:creatonDate |
| IRI | http://www.jpeg.org/ns/jponto#creationDate |
| Description | Describes the date when the image is created. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:dateTime |
| Syntax | <pre> :creationDate a owl:DatatypeProperty; rdfs:comment "Describes the date when the image is created."; rdfs:domain :Image ; rdfs:range xsd:dateTime; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . @prefix xsd: <http://www.w3.org/2001/XMLSchema#> . <#image1> a jponto:Image; jponto:creationDate "20 01-10-26T21:32:52"^^xsd:date; . </pre> |

| | |
|------------------------------|--|
| Property | jponto:creator |
| IRI | http://www.jpeg.org/ns/jponto#creator |
| Description | Describes the creator of the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | Jponto:Agent |
| Syntax | <pre> :creator a owl:ObjectProperty; rdfs:comment " Describes the creator of the image."; rdfs:domain :Image; rdfs:range:Agent; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:creator [jponto:givenName "John Smith"; jponto:mbox <mailto:jsmith@example.com>]; . </pre> |

| | |
|------------------------------|--|
| Property | jponto:description |
| IRI | http://www.jpeg.org/ns/jponto#description |
| Description | the content of the image in the form of text |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:string |
| Syntax | <pre> :description a owl:DatatypeProperty; rdfs:comment "Specifies the content of the image in the form of text."; rdfs:domain :Image ; rdfs:range xsd:string ; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:description "An example image taken during the MPEG meeting"; . </pre> |

| | |
|------------------------------|--|
| Property | jponto:familyName |
| IRI | http://www.jpeg.org/ns/jponto#familyName |
| Description | A name shared in common to identify the members of a family, as distinguished from each member's given name. |
| Has super-properties: | — |
| Has domain | jponto:Person |
| Has range | xsd:string |
| Syntax | <pre> :familyName a owl:DatatypeProperty; rdfs:comment " Specifies the family name of a person."; rdfs:domain :Person; rdfs:range xsd:string; </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#> <#image1> a jponto:Image; jponto:creator [jponto:givenName "John"; jponto:familyName "Smith"; jponto:mbox <mailto:jsmith@example.com>]; </pre> |

| | |
|------------------------------|--|
| Property | jponto:givenName |
| IRI | http://www.jpeg.org/ns/jponto#givenName |
| Description | Specifies the given name of a person. |
| Has super-properties: | — |
| Has domain | jponto:Person |
| Has range | xsd:string |
| Syntax | <pre> :givenName a owl:DatatypeProperty; rdfs:comment " Specifies the given name of a person."; rdfs:domain :Person; rdfs:range xsd:string; </pre> |
| Example | <pre> @ base <http://example.org/>. @ prefix jponto: <http://www.jpeg.org/ns/jponto#> <#image1> a jponto:Image; jponto:creator [jponto:givenName "John"; jponto:familyName "Smith"; jponto:mbox <mailto:jsmith@example.com>]; </pre> |

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| | |
|------------------------------|--|
| Property | jponto:GPSAltitude |
| IRI | http://www.jpeg.org/ns/jponto#creator |
| Description | Specifies the GPS altitude of the image, in decimal meters. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:double |
| Syntax | <pre> :GPSAltitude a owl:DatatypeProperty; rdfs:comment "Describes the GPS altitude of the image"; rdfs:domain :Image ; rdfs:range xsd:double; </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:GPSAltitude 1000.0; </pre> |

| | |
|------------------------------|---|
| Property | jponto:GPSLatitude |
| IRI | http://www.jpeg.org/ns/jponto#GPSLatitude |
| Description | Specifies the GPS latitude of the image in decimal degrees. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:double |
| Syntax | <pre> :GPSLatitude a owl:DatatypeProperty; rdfs:comment "Describes the GPS latitude of the image"; rdfs:domain :Image; rdfs:range xsd:double; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:GPSLatitude 34.0; </pre> |

| | |
|------------------------------|--|
| Property | jponto:GPSLongitude |
| IRI | http://www.jpeg.org/ns/jponto#GPSLongitude |
| Description | Specifies the GPS longitude of the image in decimal degrees. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:double |
| Syntax | <pre> :GPSLongitude a owl:DatatypeProperty; rdfs:comment "Describes the GPS longitude of the image "; rdfs:domain :Image; rdfs:range xsd:double; </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#>. <#image1> a jponto:Image; jponto:GPSLongitude 34.0; </pre> |

| | |
|------------------------------|--|
| Property | jponto:hasRegionOfInterest |
| IRI | http://www.jpeg.org/ns/jponto#hasRegionOfInterest |
| Description | Describes a region of interest of the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | jponto:RegionOfInterest |
| Syntax | <pre> :hasRegionOfInterest a owl:ObjectProperty; rdfs:comment "Describes a region of interest of the image."; rdfs:domain :Image; rdfs:range :RegionOfInterest; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . @prefix xsd: <http://www.w3.org/2001/XMLSchema#> . <#image1> a jponto:Image; jponto:hasRegionOfInterest [jponto:boundingPolygon "0 0 100 100";] . </pre> |

| | |
|------------------------------|--|
| Property | jponto:height |
| IRI | http://www.jpeg.org/ns/jponto#title |
| Description | Specifies the number of pixel rows of the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:integer |
| Syntax | <pre> :height a owl:DatatypeProperty; rdfs:comment "Specifies the number of pixel rows of the image."; rdfs:domain :Image; rdfs:range xsd:integer; </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#>. <#image1> a jponto:Image; jponto:height 1024; </pre> |

| | |
|------------------------------|---|
| Property | jponto:keyword |
| IRI | http://www.jpeg.org/ns/jponto#keyword |
| Description | Describes a keyword that characterize the image |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:string |
| Syntax | <pre> :keyword a owl:DatatypeProperty; rdfs:comment "Describes a keyword that characterize the image "; rdfs:domain :Image ; rdfs:range xsd:string ; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:keyword "Seoul"; jponto:keyword "MPEG"; jponto:keyword "social event"; . </pre> |

| | |
|------------------------------|---|
| Property | jponto:mbox |
| IRI | http://www.jpeg.org/ns/jponto#mbox |
| Description | An email address as defined in RFC 5321 |
| Has super-properties: | — |
| Has domain | jponto:Person |
| Has range | xsd:string |
| Syntax | <pre> :mbox a owl:DatatypeProperty; rdfs:comment " Specifies the mbox of a person."; rdfs:domain :Person; rdfs:range xsd:string; . </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#>. <#image1> a jponto:Image; jponto:creator [jponto:givenName "John"; jponto:familyName "Smith"; jponto:mbox <mailto:jsmith@example.com>]; . </pre> |

| | |
|------------------------------|---|
| Property | jponto:modifiedDate |
| IRI | http://www.jpeg.org/ns/jponto#modifiedDate |
| Description | Describes the date when the image is modified. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:dateTime |
| Syntax | <pre> :modifiedDate a owl:DatatypeProperty; rdfs:comment "Describes the date when the image is modified."; rdfs:domain :Image ; rdfs:range xsd:dateTime ; . </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . @prefix xsd: <http://www.w3.org/2001/XMLSchema#> . <#image1> a jponto:Image; jponto:modifiedDate "2001-10-26T21:32:52"^^xsd:date; </pre> |

| | |
|------------------------------|--|
| Property | jponto:modifier |
| IRI | http://www.jpeg.org/ns/jponto#modifier |
| Description | Describes an agent who changed the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | jponto:Agent |
| Syntax | <pre> :creator a owl:ObjectProperty; rdfs:comment "Describes an agent who changed the image."; rdfs:domain :Image; rdfs:range :Agent; . </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:modifier [jponto:givenName "John Smith"; jponto:mbox <mailto:jsmith@example.com>]; . </pre> |

| | |
|------------------------------|---|
| Property | jponto:publisher |
| IRI | http://www.jpeg.org/ns/jponto#publisher |
| Description | Describes information about the publishing people or organization of the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | jponto:Agent |
| Syntax | <pre> :publisher a owl:ObjectProperty; rdfs:comment " Describes the publisher of the image."; rdfs:domain :Image; rdfs:range :Agent; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> . <#image1> a jponto:Image; jponto:publisher [jponto:givenName "John Smith"; jponto:mbox <mailto:jsmith@example.com>]; </pre> |

| | |
|------------------------------|---|
| Property | jponto:title |
| IRI | http://www.jpeg.org/ns/jponto#title |
| Description | Specifies the title or name given to the image. |
| Has super-properties: | — |
| Has domain | jponto:Image |
| Has range | xsd:string |
| Syntax | <pre> :title a owl:DatatypeProperty; rdfs:comment "Describes the title of the image "; rdfs:domain :Image; rdfs:range xsd:string; </pre> |
| Example | <pre> @base <http://example.org/>. @prefix jponto: <http://www.jpeg.org/ns/jponto#>. <#image1> a jponto:Image; jponto:title "An example image"; </pre> |

| | |
|-----------------------------|---|
| Property | jponto:width |
| IRI | http://www.jpeg.org/ns/jponto#title |
| Description | Specifies the number of pixel columns of the image. |
| Has super-properties | — |
| Has domain | jponto:Image |
| Has range | xsd:integer |
| Syntax | <pre> :width a owl:DatatypeProperty; rdfs:comment "Specifies the number of pixel columns of the image."; rdfs:domain :Image; rdfs:range xsd:integer; </pre> |
| Example | <pre> @base <http://example.org/> . @prefix jponto: <http://www.jpeg.org/ns/jponto#> <#image1> a jponto:Image; jponto:width 1024; </pre> |

8.2.4 Turtle representation of JPOnto-core

The following is the Turtle (Terse RDF Triple Language) representation of the JPOnto-core sub-vocabulary.

```
#Target namespace
@prefix : <http://www.jpeg.org/ns/jponto#> .

#Basic constructors by W3C (RDF, RDFS, OWL)
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix jponto: <http://www.jpeg.org/ns/jponto#> .

#Datatype properties
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

:Agent a owl:Class;
  rdfs:comment "An agent (eg. person, group, software or physical artifact).";
.

:Image a owl:Class;
  rdfs:comment "Represents a digital image ";
.

:Organisation a owl:Class;
  rdfs:comment "Organisation or moral agent";
  rdfs:subClassOf :Agent ;
.

:Person a owl:Class;
  rdfs:comment "A physical person.";
.

:RegionOfInterest a owl:Class;
  rdfs:comment "Represents a certain region within a digital image.";
  rdfs:subClassOf :Image;
.

:boundingPolygon a owl:DatatypeProperty;
  rdfs:comment "Specifies the coordinates of the edges of the polygon enclosing a region in the form "x1,y1,
x2,y2, x3,y3, ...";
  rdfs:domain :Image ;
  rdfs:range xsd:string ;
.

:creationDate a owl:DatatypeProperty;
  rdfs:comment "Describes the date when the image is created.";
  rdfs:domain :Image ;
  rdfs:range xsd:dateTime;
.

:creator a owl:ObjectProperty;
  rdfs:comment " Describes the author of the image.";
  rdfs:domain :Image;
  rdfs:range :Agent;
```

```

:description a owl:DatatypeProperty;
  rdfs:comment "Specifies the content of the image in the form of text.";
  rdfs:domain :Image ;
  rdfs:range xsd:string ;
.

:familyName a owl:DatatypeProperty;
  rdfs:comment " Specifies the family name of a person.";
  rdfs:domain :Person;
  rdfs:range xsd:string;
.

:givenName a owl:DatatypeProperty;
  rdfs:comment " Specifies the given name of a person.";
  rdfs:domain :Person;
  rdfs:range xsd:string;
.

:GPSAltitude a owl:DatatypeProperty;
  rdfs:comment "Describes the GPS altitude of the image ";
  rdfs:domain :Image;
  rdfs:range xsd:double;
.

:GPSLatitude a owl:DatatypeProperty;
  rdfs:comment "Describes the GPS latitude of the image ";
  rdfs:domain :Image;
  rdfs:range xsd:double;
.

:GPSLongitude a owl:DatatypeProperty;
  rdfs:comment "Describes the GPS longitude of the image ";
  rdfs:domain :Image;
  rdfs:range xsd:double;
.

:hasRegionOfInterest a owl:ObjectProperty;
  rdfs:comment "Describes a region of interest of the image.";
  rdfs:domain :Image;
  rdfs:range :RegionOfInterest;
.

:height a owl:DatatypeProperty;
  rdfs:comment "Specifies the height of the image.";
  rdfs:domain :Image;
  rdfs:range xsd:integer;
.

:keyword a owl:DatatypeProperty;
  rdfs:comment "Describes a keyword that characterize the image ";
  rdfs:domain :Image ;
  rdfs:range xsd:string ;
.

:mbox a owl:DatatypeProperty;
  rdfs:comment " Specifies the mbox of a person.";
  rdfs:domain :Person;
  rdfs:range xsd:string;
.

:modifiedDate a owl:DatatypeProperty;
  rdfs:comment "Describes the date when the image is modified.";
  rdfs:domain :Image ;
  rdfs:range xsd:dateTime ;
.

:creator a owl:ObjectProperty;
  rdfs:comment "Describes an agent who changed the image.";

```

```

rdfs:domain :Image;
rdfs:range :Agent;
.
:publisher a owl:ObjectProperty;
  rdfs:comment " Describes the publisher of the image.";
  rdfs:domain :Image;
  rdfs:range :Agent;
.
:title a owl:DatatypeProperty;
  rdfs:comment "Describes the title of the image ";
  rdfs:domain :Image;
  rdfs:range xsd:string;
.
:width a owl:DatatypeProperty;
  rdfs:comment "Describes the title of the image ";
  rdfs:domain :Image;
  rdfs:range xsd:integer;
.

```

8.3 JPonto-visual

8.3.1 Outline

The JPonto-Visual sub-vocabulary provides a core set of classes and properties facilitating the semantic description of the contents of the image. The *jponto:depicts* property is the core component of JPonto-visual. The *jponto:depicts* property allows binding an image with the real-world objects and events that it represents. Defining the *RegionOfInterest* as a subclass of *Image*, allows to also use the *depicts* predicate to bind ROIs with real-world objects and events.

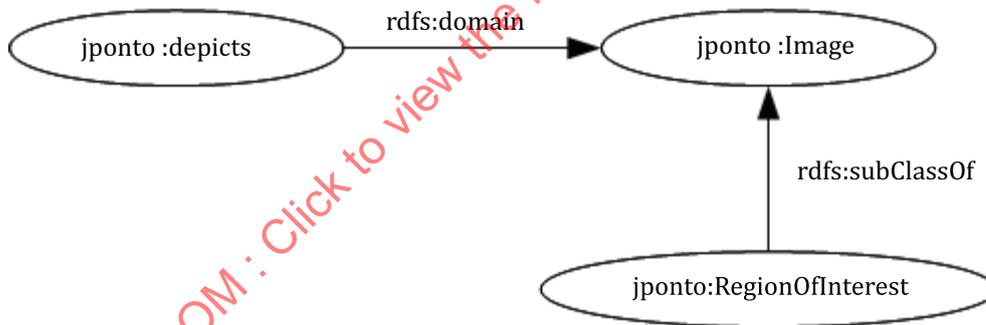


Figure 2 — The *jponto:depicts* property allows binding an image with the real-world objects and events that it represents

8.3.2 Example

This Clause provides three examples of semantic description of images.

8.3.2.1 Example 1

This example shows the semantic description of the contents of an imaginary image.

```

@base <http://example.org/> .
@prefix jponto: <http://www.jpeg.org/ns/jponto#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

<#image1> a jponto:Image;
  jponto:depicts <#person1>;
  jponto:depicts <#building1>;
.

<#person1> a jponto:Person;
  jponto:givenName "John smith";
  jponto:mbox <mailto:jsmith@example.com>;
  jponto:hasAge jponto:Youngness;
  jponto:hasFeeling jponto:Happiness;
  jponto:hasGender jponto:Male;
.

<#building1> a jponto:Building;
  jponto:givenName "Namdaemun gate";
  jponto:wikipedia https://en.wikipedia.org/wiki/Sungnyemun;
.

```

8.3.2.2 Example 2

This example shows the semantic description of the content of an image showing a boy and his grandfather.

```

@base <http://example.org/> .
@prefix jponto: <http://www.jpeg.org/ns/jponto#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

<#image1> a jponto:Image;
  jponto:depicts <#person1>;
  jponto:depicts <#person2>;
.

<#person1> a jponto:Person;
  jponto:hasAge jponto:Youngness;
  jponto:hasFeeling jponto:Happiness;
  jponto:hasGender jponto:Male;
.

<#person2> a jponto:Person;
  jponto:hasAge jponto:Oldness;
  jponto:hasGender jponto:Male;
.

<#relationship1> a jponto:Parentage;
  jponto:involves <#person1>;
  jponto:involves <#person1>;
.

```

8.3.2.3 Example 3

This example shows the semantic description of the content of an image showing a man carrying a hat in his hand and talking with a woman.

```

@base <http://example.org/> .
@prefix jponto: <http://www.jpeg.org/ns/jponto#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

<#image1> a jponto:Image;
jponto:depicts <#person1>;
jponto:depicts <#person2>;
jponto:depicts <#action1>;
jponto:depicts <#action2>;
.
<#person1> a jponto:Person;
jponto:hasGender :Male;
.
<#person2> a jponto:Person;
jponto:hasGender jponto:Female;
.
<#action1> a jponto:Carrying;
jponto:subject <#person1>;
jponto:object [
  rdf:type jponto:Hat;
];
.
<#action2> a jponto:Communication;
jponto:subject <#person1>;
jponto:subject <#person1>;
.
    
```

8.3.3 Taxonomy of classes of JPonto-visual

The root classes of JPonto-Visual (connected by *rdfs:subClassOf* edges) are shown in [Figure 3](#).

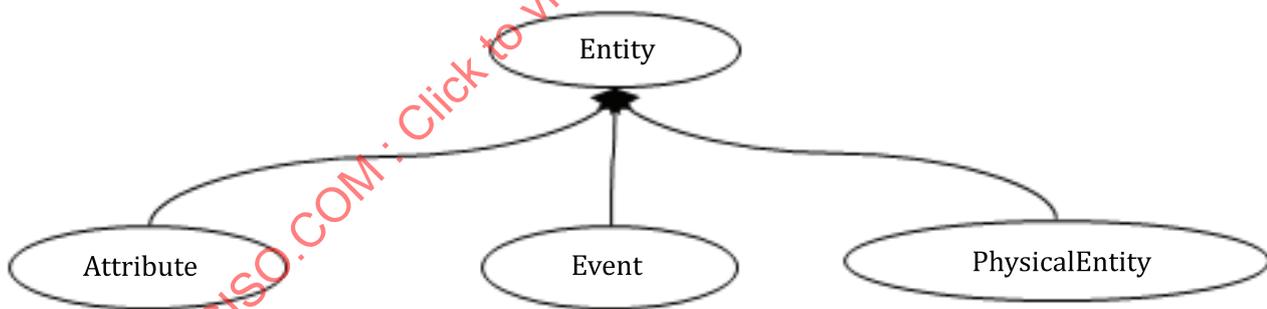


Figure 3 – Root classes of JPonto-visual (arrows represent *rdfs:subClassOf* relationships)

(informative) Design principle: Selection of classes and properties from WordNet

*JPonto-Visual does not attempt to model all possible entities depicted by the images, it just provides a taxonomy of root classes and properties, a small set of specific classes and properties and an extensibility mechanism. The classes and properties included in JPonto-Visual, along with their definitions and *rdfs:subClassOf*/*rdfs:subPropertyOf* relationships, have been selected from the WordNet lexical database for the English language.*

8.3.3.1 Subclasses of *jponto:PhysicalEntity*

Subclasses of *jponto:PhysicalEntity* (connected by *rdfs:subClassOf* edges) are shown in Figure 4. A set of specific subclasses are also defined (*jponto:Rain*, *jponto:Combustion*, *jponto:Face*, *jponto:Mountain*, *jponto:Water*, *jponto:Car*, etc.) but not shown in Figure 4.

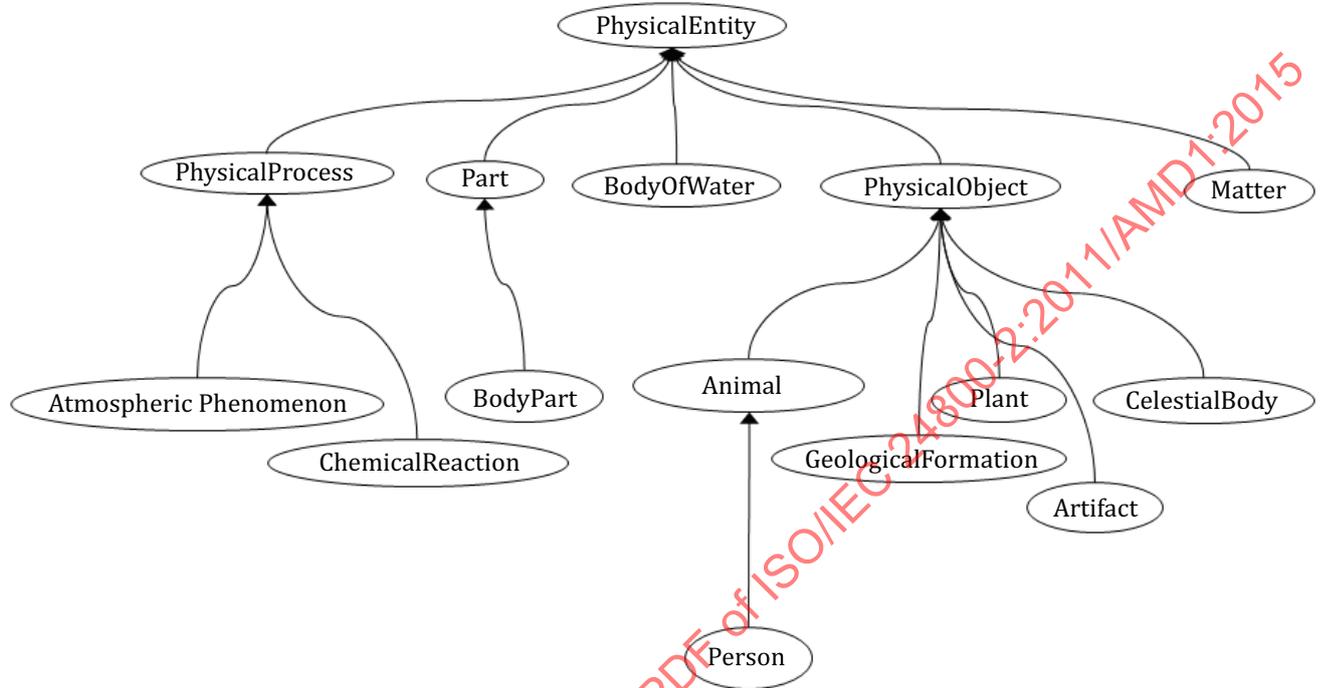


Figure 4 — Subclasses of *jponto:PhysicalEntity*

Table 1 shows all specific subclasses of *jponto:PhysicalEntity* defined within this part of ISO/IEC 24800.

Table 1 — Subclasses of *jponto:PhysicalEntity*

| | |
|-------------------------------------|---|
| Subclasses of AtmosphericPhenomenon | Aurora, Cloud, Storm, Meteor, Sunset, Wind, Snow, Rain |
| Subclasses of ChemicalReaction | Fire |
| Subclasses of BodyPart | Head, Hand, Face, Lip, Shoulder, Thorax, Venter, Toe, Finger, Back |
| Subclasses of BodyOfWater | River, Lake, Sea, Ocean, Channel, Bay, Waterfall, Stream, Gulf |
| Subclasses of Animal | Person, Dog, Cat, Mouse |
| Subclasses of GeographicalFormation | Mountain, Hill, Ridge, Delta, Cave, Beach, Crater |
| Subclasses of Artifact | Car, Bicycle, House, Gun, Hat, Shoe, Ball |
| Subclasses of Plant | Oak, Pine, Grass, Flower |
| Subclasses of CelestialBody | Sun, Moon |
| Subclasses of Matter | Water, Plastic, Food, Crystal, Coal, Wood, Quartz, Dust, Foam, Paper, Earth |

8.3.3.2 Subclasses of *jponto:Event*

Subclasses of *jponto:Event* (connected by *rdfs:subClassOf* edges) are shown in [Figure 5](#).

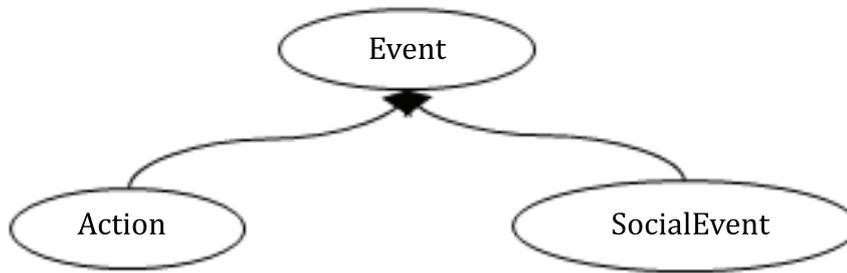


Figure 5 — Subclasses of *jponto:Event*

[Table 2](#) shows all specific subclasses of *jponto:Event* defined within this part of ISO/IEC 24800.

Table 2 — Subclasses of *jponto:Event*

| | |
|---------------------------|---|
| Subclasses of Action | Playing, Wearing, Aggression, Aggression, Touching, Carrying, Communication |
| Subclasses of SocialEvent | Wedding, BirthdayParty, Circus, Demonstration, Carnival, Play, Funeral |

(informative) Design principle: Minimization of description choices

When multiple WordNet terms may be used to describe the same facts, only the ones with more descriptive power have been included. For instance, activities such as Work, Game, etc. have been discarded as they can be described with more detail with subclasses of *jponto:Action*.

8.3.3.3 Subclasses of *jponto:Attribute*

Subclasses of *jponto:Attribute* (connected by *rdfs:subClassOf* edges) are shown in [Figure 6](#).

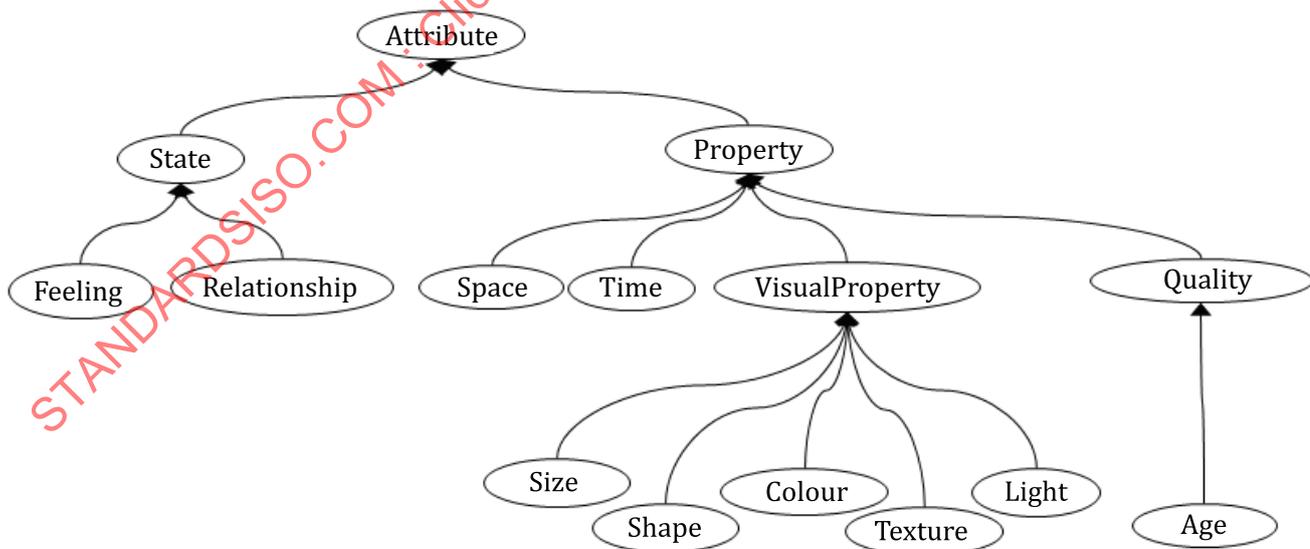


Figure 6 — Subclasses of *jponto:Attribute*

[Table 3](#) shows all specific subclasses of *jponto:Attribute* defined within this part of ISO/IEC 24800.

Table 3 — Subclasses of *jponto:Attribute*

| | |
|----------------------------|--|
| Subclasses of Feeling | Pain, Pleasure, Astonishment, Fear, Desire, Anger, Anger Sadness, Happiness, Dislike, Love |
| Subclasses of Relationship | Parentage, MaritalRelationship |
| Subclasses of Size | Big, Small, Huge |
| Subclasses of Shape | Round, Circle, Line, Square |
| Subclasses of Color | Red, Green, Blue, Pink, Olive, Black, White, Yellow, Grey, Orange, Purple, White |
| Subclasses of Texture | Smoothness, Roughness |
| Subclasses of Light | Night, Sunlight, Moonlight, Shadow, Darkness, Twilight, Incandescence |
| Subclasses of Age | Youngness, Oldness |

8.3.4 Properties of JPonto-visual

Figure 7 shows the generic properties of JPonto-Visual (connected by *rdfs:subPOf* edges).

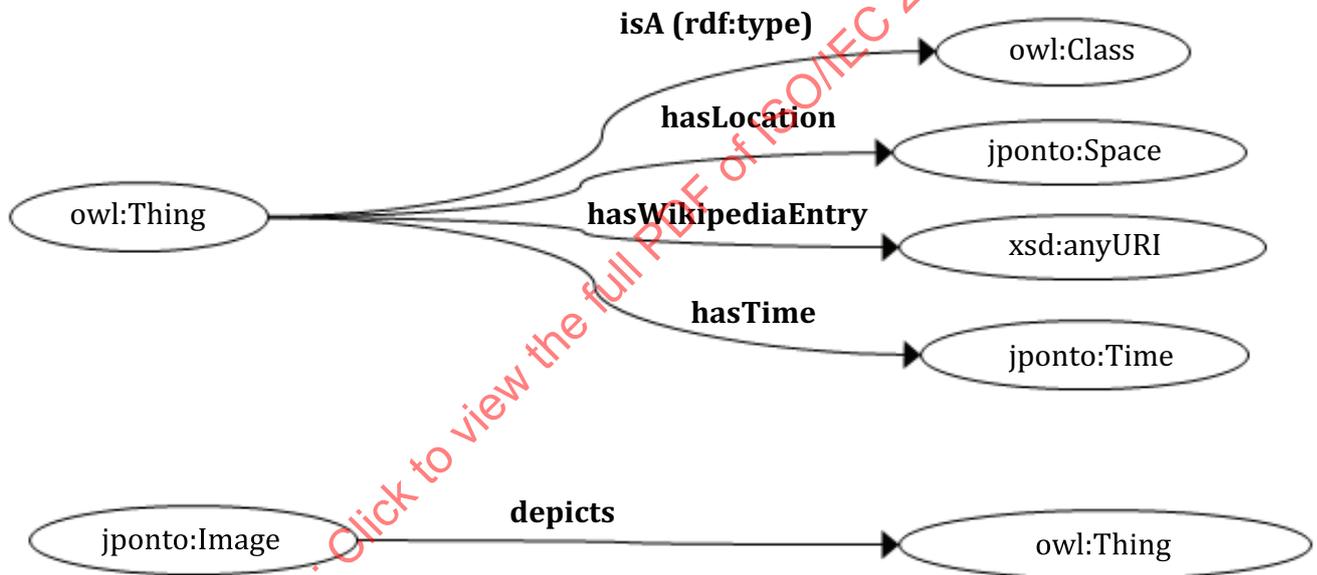


Figure 7 — Generic properties of JPonto-visual (arrows show the domain and range of the property)

Specific properties of JPonto-Visual (connected by *rdfs:subPOf* edges) are shown in Figure 8.

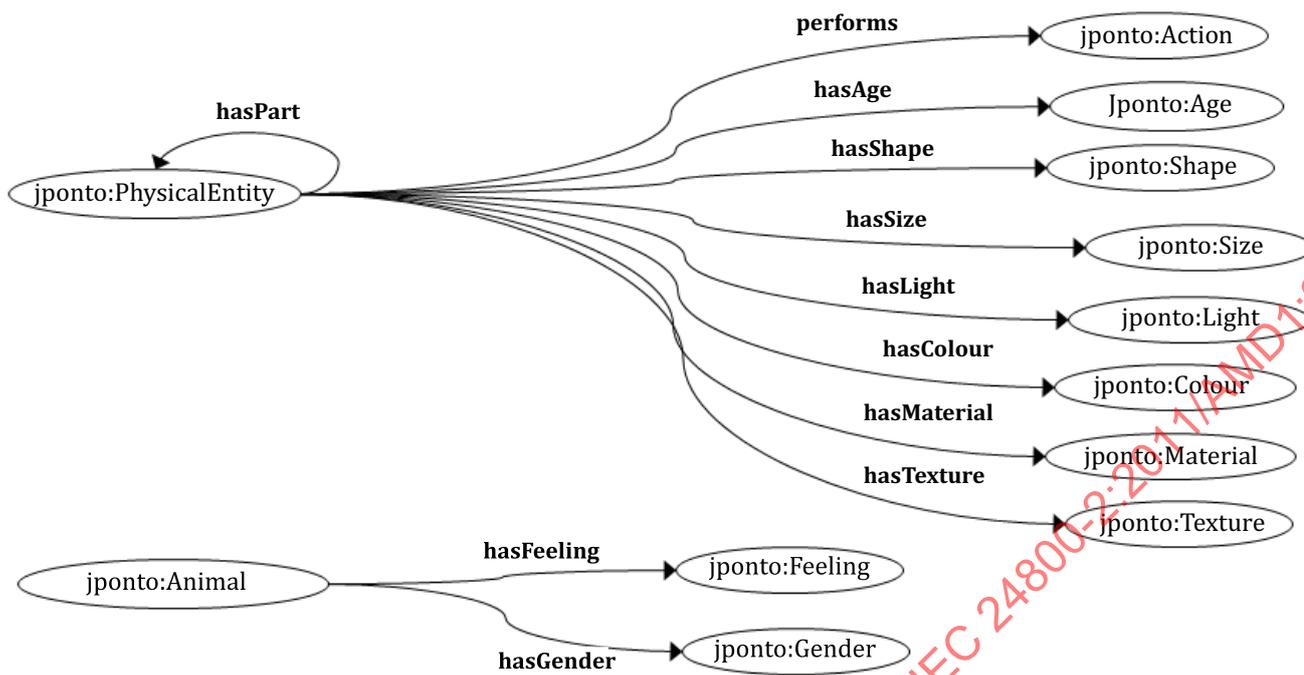


Figure 8 — Specific properties of JPOnto-visual (arrows show the domain and range of the property)

8.3.5 Semantics

8.3.5.1 JPOnto-visual class definitions (in alphabetical order)

| | |
|-----------------------------------|--|
| Class | jponto:Action |
| Superclasses | jponto:Event |
| IRI | http://www.jpeg.org/ns/jponto#Action |
| Description | Something that people do or cause to happen. |
| Described with properties: | |
| In range of | jponto:performs |
| Has subclasses | |
| Syntax | <pre> :Action a owl:Class; rdfs:comment "Something that people do or cause to happen."; rdfs:subClassOf :Event; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Age |
| Superclasses | jponto:Quality |
| IRI | http://www.jpeg.org/ns/jponto#Age |
| Description | How long something has existed. |
| Described with properties: | |
| In range of | jponto:hasAge |
| Has subclasses | |
| Syntax | <pre> :Age a owl:Class; rdfs:comment "How long something has existed."; rdfs:subClassOf :Quality; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Animal |
| Superclasses | jponto:PhysicalObject |
| IRI | http://www.jpeg.org/ns/jponto#Animal |
| Description | A living organism characterized by voluntary movement. |
| Described with properties: | jponto:hasFeeling |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Animal a owl:Class ; rdfs:comment "A living organism characterized by voluntary movement."; rdfs:subClassOf:PhysicalObject; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Artifact |
| Superclasses | jponto:PhysicalObject |
| IRI | http://www.jpeg.org/ns/jponto#Artifact |
| Description | A man-made object taken as a whole. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Artifact a owl:Class; rdfs:comment "A man-made object taken as a whole."; rdfs:subClassOf:PhysicalObject; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:AtmosphericPhenomenon |
| Superclasses | jponto:PhysicalProcess |
| IRI | http://www.jpeg.org/ns/jponto#AtmosphericPhenomenon |
| Description | A physical phenomenon associated with the atmosphere. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :AtmosphericPhenomenon a owl:Class; rdfs:comment " A physical phenomenon associated with the atmosphere."; rdfs:subClassOf :PhysicalProcess; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Attribute |
| Superclasses | jponto:Entity |
| IRI | http://www.jpeg.org/ns/jponto#Attribute |
| Description | An abstraction belonging to or characteristic of an entity. |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:State, jponto:Property |
| Syntax | <pre> :Attribute a owl:Class; rdfs:comment " An abstraction belonging to or characteristic of an entity."; rdfs:subClassOf :Entity; </pre> |
| Example | (see examples for subclasses) |

| | |
|-----------------------------------|--|
| Class | jponto:BodyOfWater |
| Superclasses | jponto:PhysicalEntity |
| IRI | http://www.jpeg.org/ns/jponto#BodyOfWater |
| Description | The part of the earth's surface covered with water (such as a river or lake or ocean). |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :BodyOfWater a owl:Class; rdfs:comment "The part of the earth's surface covered with water (such as a river or lake or ocean)."; rdfs:subClassOf :PhysicalEntity; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:BodyPart |
| Superclasses | jponto:Part |
| IRI | http://www.jpeg.org/ns/jponto#BodyPart |
| Description | Any part of an organism such as an organ or extremity. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :BodyPart a owl:Class; rdfs:comment "Any part of an organism such as an organ or extremity."; rdfs:subClassOf :Part; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:CelestialBody |
| Superclasses | jponto:PhysicalObject |
| IRI | http://www.jpeg.org/ns/jponto#CelestialBody |
| Description | Natural objects visible in the sky. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :CelestialBody a owl:Class; rdfs:comment " Natural objects visible in the sky."; rdfs:subClassOf :PhysicalObject; </pre> |

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| | |
|-----------------------------------|--|
| Class | jponto:ChemicalReaction |
| Superclasses | jponto:PhysicalProcess |
| IRI | http://www.jpeg.org/ns/jponto#ChemicalReaction |
| Description | A process in which one or more substances are changed into others. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :ChemicalReaction a owl:Class; rdfs:comment "A process in which one or more substances are changed into others."; rdfs:subClassOf :PhysicalProcess; </pre> |

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| | |
|-----------------------------------|--|
| Class | jponto:Color |
| Superclasses | jponto:VisualProperty |
| IRI | http://www.jpeg.org/ns/jponto#Color |
| Description | A visual attribute of things that results from the light they emit or transmit or reflect. |
| Described with properties: | |
| In range of | jponto:hasColor |
| Has subclasses | |
| Syntax | <pre> :Color a owl:Class; rdfs:comment "Any A visual attribute of things that results from the light they emit or transmit or reflect."; rdfs:subClassOf :VisualProperty; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Entity |
| Superclasses | — |
| IRI | http://www.jpeg.org/ns/jponto#Entity |
| Description | That which is perceived or known or inferred to have its own distinct existence (living or nonliving). |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:Attribute, jponto:Event, jponto:PhysicalEntity |
| Syntax | <pre> :Entity a owl:Class; rdfs:comment "That which is perceived or known or inferred to have its own distinct existence (living or nonliving)."; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Event |
| Superclasses | jponto:Entity |
| IRI | http://www.jpeg.org/ns/jponto#Event |
| Description | Something that happens at a given place and time. |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:PhysicalProcess, jponto:Part, jponto:BodyOfWater, jponto:PhysicalObject, Matter |
| Syntax | <pre> :Event a owl:Class; rdfs:comment "Something that happens at a given place and time."; rdfs:subClassOf :Entity; </pre> |

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| | |
|-----------------------------------|--|
| Class | jponto:Feeling |
| Superclasses | jponto:State |
| IRI | http://www.jpeg.org/ns/jponto#Feeling |
| Description | The experiencing of affective and emotional states. |
| Described with properties: | |
| In range of | jponto:hasFeeling |
| Has subclasses | |
| Syntax | <pre> :Feeling a owl:Class; rdfs:comment "The experiencing of affective and emotional states."; rdfs:subClassOf :State; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Gender |
| Superclasses | jponto:Attribute |
| IRI | http://www.jpeg.org/ns/jponto#Gender |
| Description | The state of being male or female. |
| Described with properties: | |
| In range of | jponto:hasGender |
| Has subclasses | |
| Syntax | <pre> :Gender a owl:Class; rdfs:comment "The state of being male or female.."; rdfs:subClassOf :Attribute; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:GeologicalFormation |
| Superclasses | jponto:PhysicalObject |
| IRI | http://www.jpeg.org/ns/jponto#GeologicalFormation |
| Description | The geological features of the earth. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :GeologicalFormation a owl:Class; rdfs:comment "The geological features of the earth."; rdfs:subClassOf :PhysicalObject; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Light |
| Superclasses | jponto:VisualProperty |
| IRI | http://www.jpeg.org/ns/jponto#Light |
| Description | The visual effect of illumination on objects or scenes as created in pictures. |
| Described with properties: | |
| In range of | jponto:hasLight |
| Has subclasses | |
| Syntax | <pre> :Light a owl:Class; rdfs:comment "The visual effect of illumination on objects or scenes as created in pictures."; rdfs:subClassOf :VisualProperty; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Matter |
| Superclasses | jponto:PhysicalEntity |
| IRI | http://www.jpeg.org/ns/jponto#Matter |
| Description | That which has mass and occupies space. |
| Described with properties: | |
| In range of | jponto:hasMaterial |
| Has subclasses | |
| Syntax | <pre> :Matter a owl:Class; rdfs:comment " That which has mass and occupies space "; rdfs:subClassOf :PhysicalEntity; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Part |
| Superclasses | jponto:PhysicalEntity |
| IRI | http://www.jpeg.org/ns/jponto#Part |
| Description | Something determined in relation to something that includes it. |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:BodyPart |
| Syntax | <pre> :Part a owl:Class; rdfs:comment " Something determined in relation to something that includes it."; rdfs:subClassOf :PhysicalEntity; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Person |
| Superclasses | jponto:Animal |
| IRI | http://www.jpeg.org/ns/jponto#Person |
| Description | Any living or extinct member of the family Hominidae characterized by superior intelligence, articulate speech, and erect carriage. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Person a owl:Class; rdfs:comment "Any living or ex tinct member of the family Hominidae characterized by superior intelligence, articulate speech, and erect carriage."; rdfs:subClassOf :Animal; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:PhysicalEntity |
| Superclasses | jponto:Entity |
| IRI | http://www.jpeg.org/ns/jponto#PhysicalEntity |
| Description | An entity that has physical existence. |
| Described with properties: | jponto:performs, jponto:hasAge, jponto:hasShape, jponto:hasSize, jponto:hasLight, jponto:hasColor, jponto:hasMaterial, jponto:hasTexture |
| In range of | |
| Has subclasses | jponto:PhysicalProcess, jponto: Part, jponto:BodyOfWater, jponto:PhysicalObject, Matter |
| Syntax | <pre> :Entity a owl:Class; rdfs:comment " An entity that has physical existence."; rdfs:subClassOf :Entity; </pre> |

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| | |
|-----------------------------------|--|
| Class | jponto:PhysicalObject |
| Superclasses | jponto:PhysicalEntity |
| IRI | http://www.jpeg.org/ns/jponto#PhysicalObject |
| Description | A tangible and visible entity; an entity that can cast a shadow. |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:Animal, jponto:GeologicalFormation, jponto:Plant, jponto:Artificat, jponto:CelestialBody |
| Syntax | <pre> :AnimatedThing a owl:Class; rdfs:comment "A tangible and visible entity; an entity that can cast a shadow "; rdfs:subClassOf :PhysicalEntity; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:PhysicalProcess |
| Superclasses | jponto:PhysicalEntity |
| IRI | http://www.jpeg.org/ns/jponto#PhysicalProcess |
| Description | A sustained phenomenon or one marked by gradual changes through a series of states. |
| Described with properties: | |
| In range of | |
| Has subclasses | jponto:AtmosphericPhenomenon, jponto:ChemicalReaction |
| Syntax | <pre> :PhysicalProcess a owl:Class; rdfs:comment "A sustained phenomenon or one marked by gradual changes through a series of states."; rdfs:subClassOf :PhysicalEntity; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Plant |
| Superclasses | jponto:PhysicalObject |
| IRI | http://www.jpeg.org/ns/jponto#Plant |
| Description | A living organism lacking the power of locomotion. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Plant a owl:Class; rdfs:comment " A living organism lacking the power of locomotion."; rdfs:subClassOf :PhysicalObject; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Property |
| Superclasses | jponto:Attribute |
| IRI | http://www.jpeg.org/ns/jponto#Property |
| Description | A construct whereby objects or individuals can be distinguished. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Property a owl:Class; rdfs:comment "A construct whereby objects or individuals can be distinguished."; rdfs:subClassOf :Attribute; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Quality |
| Superclasses | jponto:Property |
| IRI | http://www.jpeg.org/ns/jponto#Quality |
| Description | An essential and distinguishing attribute of something or someone. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Quality a owl:Class; rdfs:comment "An essential and distinguishing attribute of something or someone."; rdfs:subClassOf :Property; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Relationship |
| Superclasses | jponto:State |
| IRI | http://www.jpeg.org/ns/jponto#Relationship |
| Description | A relation between people. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :Relationship a owl:Class; rdfs:comment "A relation between people."; rdfs:subClassOf :State; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Shape |
| Superclasses | jponto:VisualProperty |
| IRI | http://www.jpeg.org/ns/jponto#Shape |
| Description | Any spatial attributes (especially as defined by outline). |
| Described with properties: | |
| In range of | jponto:hasShape |
| Has subclasses | |
| Syntax | <pre> :Shape a owl:Class; rdfs:comment "Any spatial attributes (especially as defined by outline)."; rdfs:subClassOf :VisualProperty; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Size |
| Superclasses | jponto:VisualProperty |
| IRI | http://www.jpeg.org/ns/jponto#Size |
| Description | The physical magnitude of something (how big it is). |
| Described with properties: | |
| In range of | jponto:hasSize |
| Has subclasses | |
| Syntax | <pre> :Size a owl:Class; rdfs:comment "The physical magnitude of something (how big it is)."; rdfs:subClassOf :VisualProperty; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:SocialEvent |
| Superclasses | jponto:Event |
| IRI | http://www.jpeg.org/ns/jponto#SocialEvent |
| Description | An event characteristic of persons forming groups. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :SocialEvent a owl:Class; rdfs:comment "An event characteristic of persons forming groups."; rdfs:subClassOf :Event; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Space |
| Superclasses | jponto:Property |
| IRI | http://www.jpeg.org/ns/jponto#Space |
| Description | A determination of the place where something is. |
| Described with properties: | |
| In range of | jponto:hasLocation |
| Has subclasses | |
| Syntax | <pre> :Space a owl:Class; rdfs:comment "A determination of the place where something is."; rdfs:subClassOf :Property; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:State |
| Superclasses | jponto:Attribute |
| IRI | http://www.jpeg.org/ns/jponto#State |
| Description | The way something is with respect to its main attributes. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :State a owl:Class; rdfs:comment "The way something is with respect to its main attributes."; rdfs:subClassOf :Attribute; </pre> |

| | |
|-----------------------------------|---|
| Class | jponto:Texture |
| Superclasses | jponto:VisualProperty |
| IRI | http://www.jpeg.org/ns/jponto#Texture |
| Description | The characteristic appearance of a surface having a tactile quality. |
| Described with properties: | |
| In range of | jponto:hasTexture |
| Has subclasses | |
| Syntax | <pre> :Texture a owl:Class; rdfs:comment "The characteristic appearance of a surface having a tactile quality)."; rdfs:subClassOf :VisualProperty; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:Time |
| Superclasses | jponto:Property |
| IRI | http://www.jpeg.org/ns/jponto#Space |
| Description | The fourth coordinate that is required (along with three spatial dimensions) to specify a physical event. |
| Described with properties: | |
| In range of | jponto:hasTime |
| Has subclasses | |
| Syntax | <pre> :Time a owl:Class; rdfs:comment "The fourth coordinate that is required (along with three spatial dimensions) to specify a physical event."; rdfs:subClassOf :Property; </pre> |

| | |
|-----------------------------------|--|
| Class | jponto:VisualProperty |
| Superclasses | jponto:Property |
| IRI | http://www.jpeg.org/ns/jponto#VisualProperty |
| Description | The visual percept of a region. |
| Described with properties: | |
| In range of | |
| Has subclasses | |
| Syntax | <pre> :VisualProperty a owl:Class; rdfs:comment "The visual percept of a region."; rdfs:subClassOf :Property; </pre> |

8.3.5.2 JPonto-visual property definitions (in alphabetical order)

| | |
|------------------------------|---|
| Property | jponto:depicts |
| IRI | http://www.jpeg.org/ns/jponto#depicts |
| Description | Describes the real world people, things or phenomena depicted in the image. |
| Has super-properties: | — |
| Has domain | jponto:Image, jponto:RegionOfInterest |
| Has range | — |
| Syntax | <pre> :depicts a owl:ObjectProperty; rdfs:comment "Describes the real world people, things or phenomena depicted in the image."; rdfs:domain :Image; </pre> |

| | |
|------------------------------|--|
| Property | jponto:hasAge |
| IRI | http://www.jpeg.org/ns/jponto#hasAge |
| Description | How long something has existed. |
| Has super-properties: | — |
| Has domain | jponto:PhysicalEntity |
| Has range | jponto:Age |
| Syntax | <pre> :hasAge a owl:ObjectProperty; rdfs:comment "How long something has existed."; rdfs:domain :PhysicalEntity; rdfs:range :Age; </pre> |

| | |
|------------------------------|--|
| Property | jponto:hasColor |
| IRI | http://www.jpeg.org/ns/jponto#hasColor |
| Description | A visual attribute of things that results from the light they emit or transmit or reflect. |
| Has super-properties: | — |
| Has domain | jponto:PhysicalEntity |
| Has range | jponto:Color |
| Syntax | <pre> :hasColor a owl:ObjectProperty; rdfs:comment "A visual attribute of things that results from the light they emit or transmit or reflect."; rdfs:domain :PhysicalEntity; rdfs:range :Color; </pre> |

| | |
|------------------------------|--|
| Property | jponto:hasFeeling |
| IRI | http://www.jpeg.org/ns/jponto#hasFeeling |
| Description | To have a physical or emotional sensation of (something). |
| Has super-properties: | — |
| Has domain | jponto:Animal |
| Has range | jponto:Feeling |
| Syntax | <pre> :hasFeeling a owl:ObjectProperty; rdfs:comment "To have a physical or emotional sensation of (something)."; rdfs:domain :Animal; rdfs:domain :Feeling; </pre> |

| | |
|------------------------------|---|
| Property | jponto:hasGender |
| IRI | http://www.jpeg.org/ns/jponto#hasGender |
| Description | The state of being male or female. |
| Has super-properties: | — |
| Has domain | jponto:Animal |
| Has range | jponto:Gender |
| Syntax | <pre> :hasGender a owl:ObjectProperty; rdfs:comment "To have a physical or emotional sensation of (something)."; rdfs:domain :Animal; rdfs:domain :Gender; </pre> |