

# Description logic view: DOLCE-RL

## Classes

### abstract

abstract  $\sqsubseteq \forall$  has-quality  $\neg$ temporal-location\_q  
abstract  $\sqsubseteq$  particular  
abstract  $\sqsubseteq \forall$  has-quality  $\neg$ spatial-location\_q  
abstract  $\sqsubseteq \neg$  perdurant  
abstract  $\sqsubseteq \neg$  quality  
abstract  $\sqsubseteq \neg$  endurant

### abstract-quality

abstract-quality  $\sqsubseteq$  quality  
abstract-quality  $\sqsubseteq \forall$  q-location abstract-region  
abstract-quality  $\sqsubseteq \forall$  has-quality abstract-quality  
abstract-quality  $\sqsubseteq \neg$  physical-quality  
abstract-quality  $\sqsubseteq \neg$  temporal-quality

### abstract-region

abstract-region  $\sqsubseteq \forall$  part abstract-region  
abstract-region  $\sqsubseteq$  region  
abstract-region  $\sqsubseteq \forall$  q-location-of abstract-quality  
abstract-region  $\sqsubseteq \neg$  temporal-region  
abstract-region  $\sqsubseteq \neg$  physical-region

### accomplishment

accomplishment  $\sqsubseteq$  event

### achievement

achievement  $\sqsubseteq$  event

### amount-of-matter

amount-of-matter  $\sqsubseteq$  physical-endurant  
amount-of-matter  $\sqsubseteq \neg$  feature  
amount-of-matter  $\sqsubseteq \neg$  physical-object

### arbitrary-sum

arbitrary-sum  $\sqsubseteq$  endurant  
arbitrary-sum  $\sqsubseteq \neg$  non-physical-endurant  
arbitrary-sum  $\sqsubseteq \neg$  physical-endurant

## **dependent-place**

dependent-place  $\sqsubseteq$  feature

## **endurant**

endurant  $\sqsubseteq \forall$  part endurant

endurant  $\sqsubseteq$  spatio-temporal-particular

endurant  $\sqsubseteq \forall$  specific-constant-constituent endurant

endurant  $\sqsubseteq \neg$  quality

endurant  $\sqsubseteq \neg$  perdurant

endurant  $\sqsubseteq \neg$  abstract

## **event**

event  $\sqsubseteq$  perdurant

## **feature**

feature  $\sqsubseteq$  physical-endurant

feature  $\sqsubseteq \neg$  amount-of-matter

feature  $\sqsubseteq \neg$  physical-object

## **non-physical-endurant**

non-physical-endurant  $\sqsubseteq \forall$  has-quality abstract-quality

non-physical-endurant  $\sqsubseteq \forall$  part non-physical-endurant

non-physical-endurant  $\sqsubseteq$  endurant

non-physical-endurant  $\sqsubseteq \neg$  physical-endurant

non-physical-endurant  $\sqsubseteq \neg$  arbitrary-sum

## **non-physical-object**

non-physical-object  $\sqsubseteq \forall$  part non-physical-object

non-physical-object  $\sqsubseteq$  non-physical-endurant

## **particular**

### **perdurant**

perdurant  $\sqsubseteq$  spatio-temporal-particular

perdurant  $\sqsubseteq \forall$  has-quality temporal-quality

perdurant  $\sqsubseteq \forall$  specific-constant-constituent perdurant

perdurant  $\sqsubseteq \forall$  part perdurant

perdurant  $\sqsubseteq \neg$  abstract

perdurant  $\sqsubseteq \neg$  endurant

perdurant  $\sqsubseteq \neg$  quality

### **physical-endurant**

physical-endurant  $\sqsubseteq$  endurant  
physical-endurant  $\sqsubseteq \forall$  specific-constant-constituent physical-endurant  
physical-endurant  $\sqsubseteq \forall$  part physical-endurant  
physical-endurant  $\sqsubseteq \neg$  non-physical-endurant  
physical-endurant  $\sqsubseteq \neg$  arbitrary-sum

### **physical-object**

physical-object  $\sqsubseteq$  physical-endurant  
physical-object  $\sqsubseteq \neg$  amount-of-matter  
physical-object  $\sqsubseteq \neg$  feature

### **physical-quality**

physical-quality  $\sqsubseteq$  quality  
physical-quality  $\sqsubseteq \forall$  has-quality physical-quality  
physical-quality  $\sqsubseteq \forall$  q-location physical-region  
physical-quality  $\sqsubseteq \neg$  abstract-quality  
physical-quality  $\sqsubseteq \neg$  temporal-quality

### **physical-region**

physical-region  $\sqsubseteq$  region  
physical-region  $\sqsubseteq \forall$  part physical-region  
physical-region  $\sqsubseteq \forall$  q-location-of physical-quality  
physical-region  $\sqsubseteq \neg$  temporal-region  
physical-region  $\sqsubseteq \neg$  abstract-region

### **process**

process  $\sqsubseteq$  stative

### **proposition**

proposition  $\sqsubseteq$  abstract

### **quale**

#### **quality**

quality  $\sqsubseteq$  spatio-temporal-particular  
quality  $\sqsubseteq \neg$  endurant  
quality  $\sqsubseteq \neg$  abstract  
quality  $\sqsubseteq \neg$  perdurant

## **quality-space**

### **region**

region  $\sqsubseteq \forall$  part region  
region  $\sqsubseteq$  abstract

### **relevant-part**

relevant-part  $\sqsubseteq$  feature

### **set**

set  $\sqsubseteq$  abstract

### **space-region**

space-region  $\sqsubseteq \forall$  q-location-of spatial-location\_q  
space-region  $\sqsubseteq$  physical-region  
space-region  $\sqsubseteq \forall$  part space-region

### **spatial-location<sub>q</sub>**

spatial-location\_q  $\sqsubseteq$  physical-quality

### **spatio-temporal-particular**

#### **spatio-temporal-region**

spatio-temporal-region  $\sqsubseteq$  space-region

### **state**

state  $\sqsubseteq$  stative

### **stative**

stative  $\sqsubseteq$  perdurant

### **temporal-location<sub>q</sub>**

temporal-location\_q  $\sqsubseteq$  temporal-quality

### **temporal-quality**

temporal-quality  $\sqsubseteq$  quality  
temporal-quality  $\sqsubseteq \forall$  has-quality temporal-quality  
temporal-quality  $\sqsubseteq \forall$  q-location temporal-region  
temporal-quality  $\sqsubseteq \neg$  abstract-quality  
temporal-quality  $\sqsubseteq \neg$  physical-quality

### temporal-region

temporal-region  $\sqsubseteq \forall$  q-location-of temporal-quality

temporal-region  $\sqsubseteq \forall$  part temporal-region

temporal-region  $\sqsubseteq$  region

temporal-region  $\sqsubseteq \neg$  physical-region

temporal-region  $\sqsubseteq \neg$  abstract-region

### time-interval

time-interval  $\sqsubseteq$  temporal-region

## Object properties

### abstract-location

$\sqsubseteq$  exact-location

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlabstract-location}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.}$   
 $\text{location-of}_i^-$

$\exists$  abstract-location Thing  $\sqsubseteq$  non-physical-endurant

$\top \sqsubseteq \forall$  abstract-location abstract-region

### abstract-location-of

$\sqsubseteq$  exact-location-of

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlabstract-location}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.}$   
 $\text{location-of}_i^-$

$\exists$  abstract-location-of Thing  $\sqsubseteq$  abstract-region

$\top \sqsubseteq \forall$  abstract-location-of non-physical-endurant

### atomic-part

$\sqsubseteq$  part

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}$   
 $\text{part-of}_i^-$

$\exists$  atomic-part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  atomic-part particular

### atomic-part-of

$\sqsubseteq$  part-of

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlatomic-part}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}$   
 $\text{part-of}_i^-$

$\exists$  atomic-part-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  atomic-part-of particular

### **boundary**

$\sqsubseteq$  proper-part

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary-of}_i^-$

$\exists$  boundary Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  boundary particular

### **boundary-of**

$\sqsubseteq$  proper-part-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlboundary-of}_i^-$

$\exists$  boundary-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  boundary-of particular

### **constant-participant**

$\sqsubseteq$  participant

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant}_i^-$

$\exists$  constant-participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  constant-participant endurant

### **constant-participant-in**

$\sqsubseteq$  participant-in

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant-in}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlconstant-participant}_i^-$

$\exists$  constant-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  constant-participant-in perdurant

### **exact-location**

$\sqsubseteq$  generic-location

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location-of}_i^-$

$\exists$  exact-location Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  exact-location region

### **exact-location-of**

$\sqsubseteq$  generic-location-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlexact-location-of}_i^-$

$\exists$  exact-location-of Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  exact-location-of particular

### **generic-constituent**

⊆ immediate-relation

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-constituent-of<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>constituent<sub>i</sub>⌋<sup>-</sup>

∃ generic-constituent Thing ⊆ particular

⊤ ⊆ ∀ generic-constituent particular

### **generic-constituent-of**

⊆ immediate-relation-i

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-constituent-of<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>constituent<sub>i</sub>⌋<sup>-</sup>

∃ generic-constituent-of Thing ⊆ particular

⊤ ⊆ ∀ generic-constituent-of particular

### **generic-dependent**

⊆ immediate-relation

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-dependent<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>dependent-on<sub>i</sub>⌋<sup>-</sup>

∃ generic-dependent Thing ⊆ particular

⊤ ⊆ ∀ generic-dependent particular

### **generic-location**

⊆ mediated-relation

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-location-of<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>location<sub>i</sub>⌋<sup>-</sup>

∃ generic-location Thing ⊆ particular

⊤ ⊆ ∀ generic-location particular

### **generic-location-of**

⊆ mediated-relation-i

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-location-of<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>location<sub>i</sub>⌋<sup>-</sup>

∃ generic-location-of Thing ⊆ particular

⊤ ⊆ ∀ generic-location-of particular

### **generically-dependent-on**

⊆ immediate-relation-i

⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>generic-dependent<sub>i</sub> ≡ ⌈<http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl>dependent-on<sub>i</sub>⌋<sup>-</sup>

∃ generically-dependent-on Thing ⊆ particular

⊤ ⊆ ∀ generically-dependent-on particular

### has-qualè

⊆ q-location

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhas-qualè}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlqualè}_i^-$

$\exists \text{ has-qualè Thing } \sqsubseteq \text{ quality}$

$\top \sqsubseteq \forall \text{ has-qualè qualè}$

### has-quality

⊆ immediate-relation-i

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlinherent-in}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlquality}_i^-$

$\exists \text{ has-quality Thing } \sqsubseteq \text{ particular}$

$\top \sqsubseteq \forall \text{ has-quality quality}$

### has-t-quality

⊆ has-quality

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlt-inherent-in}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlquality}_i^-$

$\exists \text{ has-t-quality Thing } \sqsubseteq \text{ particular}$

$\top \sqsubseteq \forall \text{ has-t-quality quality}$

### host

⊆ specifically-constantly-dependent-on

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlphysical-endurant}_i^-$

$\exists \text{ host Thing } \sqsubseteq \text{ feature}$

$\top \sqsubseteq \forall \text{ host physical-endurant}$

### host-of

⊆ specific-constant-dependent

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhost-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlfeature}_i^-$

$\exists \text{ host-of Thing } \sqsubseteq \text{ physical-endurant}$

$\top \sqsubseteq \forall \text{ host-of feature}$

### identity-c

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-c}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-c}_i^-$

$\exists \text{ identity-c Thing } \sqsubseteq \text{ particular}$

$\top \sqsubseteq \forall \text{ identity-c particular}$

### identity-n

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-n}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlidentity-n}_i^-$



$\exists$  identity-n Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  identity-n particular

### immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{immediate-relation-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{immediate-relation-}i_i^-$   
 $\exists$  immediate-relation Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  immediate-relation particular

### immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{immediate-relation-i-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{immediate-relation-i-}i_i^-$   
 $\exists$  immediate-relation-i Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  immediate-relation-i particular

### inherent-in

$\sqsubseteq$  immediate-relation  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{inherent-in-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{inherent-in-}i_i^-$   
 $\exists$  inherent-in Thing  $\sqsubseteq$  quality  
 $\top \sqsubseteq \forall$  inherent-in particular

### life

$\sqsubseteq$  constant-participant-in  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{life-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{life-of-}i_i^-$   
 $\exists$  life Thing  $\sqsubseteq$  endurant  
 $\top \sqsubseteq \forall$  life perdurant

### life-of

$\sqsubseteq$  constant-participant  
 $\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{life-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{life-of-}i_i^-$   
 $\exists$  life-of Thing  $\sqsubseteq$  perdurant  
 $\top \sqsubseteq \forall$  life-of endurant

### mediated-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{mediated-relation-}i_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}\text{mediated-relation-}i_i^-$   
 $\exists$  mediated-relation Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  mediated-relation particular

### mediated-relation-i

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmediated-relation-i]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmediated-relation-i]}^{-}$

$\exists \text{ mediated-relation-i Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{ mediated-relation-i particular}$

### mereologically-coincides

$\sqsubseteq \text{temporary-part}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmereologically-coincides]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlmereologically-coincides]}^{-}$

$\exists \text{ mereologically-coincides Thing} \sqsubseteq \text{endurant}$

$\top \sqsubseteq \forall \text{ mereologically-coincides endurant}$

### overlaps

$\sqsubseteq \text{mediated-relation}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owloverlaps]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owloverlaps]}^{-}$

$\exists \text{ overlaps Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{ overlaps particular}$

### part

$\exists \text{ part Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{ part particular}$

### part-of

$\sqsubseteq \text{immediate-relation-i}$

$\exists \text{ part-of Thing} \sqsubseteq \text{particular}$

$\top \sqsubseteq \forall \text{ part-of particular}$

### participant

$\sqsubseteq \text{immediate-relation}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant]}^{-}$

$\exists \text{ participant Thing} \sqsubseteq \text{perdurant}$

$\top \sqsubseteq \forall \text{ participant endurant}$

### participant-in

$\sqsubseteq \text{immediate-relation-i}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant-in]} \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant-in]}^{-}$

$\exists \text{ participant-in Thing} \sqsubseteq \text{endurant}$

$\top \sqsubseteq \forall \text{ participant-in perdurant}$

### **partly-compresent**

$\sqsubseteq$  mediated-relation

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpartly-compresent}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-compresent}_i^-$

$\exists$  partly-compresent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  partly-compresent particular

### **physical-location**

$\sqsubseteq$  exact-location

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlphysical-location}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-location-of}_i^-$

$\exists$  physical-location Thing  $\sqsubseteq$  physical-endurant

$\top \sqsubseteq \forall$  physical-location physical-region

### **physical-location-of**

$\sqsubseteq$  exact-location-of

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlphysical-location}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite-location-of}_i^-$

$\exists$  physical-location-of Thing  $\sqsubseteq$  physical-region

$\top \sqsubseteq \forall$  physical-location-of physical-endurant

### **proper-part**

$\exists$  proper-part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  proper-part particular

### **proper-part-of**

$\exists$  proper-part-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  proper-part-of particular

### **q-location**

$\sqsubseteq$  immediate-relation

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location-of}_i^-$

$\exists$  q-location Thing  $\sqsubseteq$  quality

$\top \sqsubseteq \forall$  q-location region

### **q-location-of**

$\sqsubseteq$  immediate-relation-i

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location}_i \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlq-location-of}_i^-$

$\exists$  q-location-of Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  q-location-of quality

### **q-present-at**

$\sqsubseteq$  mediated-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltime-of-q-presence-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpresent-at}_i^-$

$\exists$  q-present-at Thing  $\sqsubseteq$  physical-quality

$\top \sqsubseteq \forall$  q-present-at time-interval

### **quale-of**

$\sqsubseteq$  q-location-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlhas-quale}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlquale-of}_i^-$

$\exists$  quale-of Thing  $\sqsubseteq$  quale

$\top \sqsubseteq \forall$  quale-of quality

### **r-location**

$\sqsubseteq$  immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlr-location}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlr-location-of}_i^-$

$\exists$  r-location Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  r-location region

### **r-location-of**

$\sqsubseteq$  immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlr-location}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlr-location-of}_i^-$

$\exists$  r-location-of Thing  $\sqsubseteq$  region

$\top \sqsubseteq \forall$  r-location-of region

### **sibling-part**

$\sqsubseteq$  mediated-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl sibling-part}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl sibling-part}_i^-$

$\exists$  sibling-part Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  sibling-part particular

### **spatio-temporal-presence-of**

$\sqsubseteq$  exact-location-of

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspatio-temporal-presence-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspatio-temporally-present-at}_i^-$

$\exists$  spatio-temporal-presence-of Thing  $\sqsubseteq$  spatio-temporal-region  
 $\top \sqsubseteq \forall$  spatio-temporal-presence-of particular

### **spatio-temporally-present-at**

$\sqsubseteq$  exact-location

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspatio-temporal-presence-of}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspatio-temporally-present-at}_i^-$

$\exists$  spatio-temporally-present-at Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  spatio-temporally-present-at spatio-temporal-region

### **specific-constant-constituent**

$\sqsubseteq$  immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-constituent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-constituent-of}_i^-$

$\exists$  specific-constant-constituent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  specific-constant-constituent particular

### **specific-constant-constituent-of**

$\sqsubseteq$  immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-constituent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-constituent-of}_i^-$

$\exists$  specific-constant-constituent-of Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  specific-constant-constituent-of particular

### **specific-constant-dependent**

$\sqsubseteq$  immediate-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-dependent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecifically-constantly-dependent-on}_i^-$

$\exists$  specific-constant-dependent Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  specific-constant-dependent particular

### **specifically-constantly-dependent-on**

$\sqsubseteq$  immediate-relation-i

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecific-constant-dependent}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlspecifically-constantly-dependent-on}_i^-$

$\exists$  specifically-constantly-dependent-on Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  specifically-constantly-dependent-on particular

### **strong-connection**

$\sqsubseteq$  mediated-relation

$\text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlstrong-connection}_i \equiv \text{!http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlstrong-connection}_i^-$

$\exists$  strong-connection Thing  $\sqsubseteq$  particular  
 $\top \sqsubseteq \forall$  strong-connection particular

### **t-inherent-in**

$\sqsubseteq$  inherent-in  
 $\text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlt-inherent-in}_i \equiv \text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owl}$   
 $\text{t-quality}_i^-$   
 $\exists$  t-inherent-in Thing  $\sqsubseteq$  quality  
 $\top \sqsubseteq \forall$  t-inherent-in particular

### **temporary-atomic-part**

$\sqsubseteq$  temporary-proper-part  
 $\text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-atomic-part-of}_i \equiv \text{¡http://www.loa-cnr.it/ontologies/DOL}$   
 $\text{Lite.owltemporary-atomic-part}_i^-$   
 $\exists$  temporary-atomic-part Thing  $\sqsubseteq$  endurant  
 $\top \sqsubseteq \forall$  temporary-atomic-part endurant

### **temporary-atomic-part-of**

$\sqsubseteq$  temporary-proper-part-of  
 $\text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-atomic-part-of}_i \equiv \text{¡http://www.loa-cnr.it/ontologies/DOL}$   
 $\text{Lite.owltemporary-atomic-part}_i^-$   
 $\exists$  temporary-atomic-part-of Thing  $\sqsubseteq$  endurant  
 $\top \sqsubseteq \forall$  temporary-atomic-part-of endurant

### **temporary-part**

$\sqsubseteq$  part  
 $\sqsubseteq$  partly-compresent  
 $\text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-part-of}_i \equiv \text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite}$   
 $\text{part}_i^-$   
 $\exists$  temporary-part Thing  $\sqsubseteq$  endurant  
 $\top \sqsubseteq \forall$  temporary-part endurant

### **temporary-part-of**

$\sqsubseteq$  partly-compresent  
 $\sqsubseteq$  part-of  
 $\text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-part-of}_i \equiv \text{¡http://www.loa-cnr.it/ontologies/DOLCE-Lite}$   
 $\text{part}_i^-$   
 $\exists$  temporary-part-of Thing  $\sqsubseteq$  endurant  
 $\top \sqsubseteq \forall$  temporary-part-of endurant

### **temporary-participant**

$\sqsubseteq$  participant

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant-in}_i^-$

$\exists \text{ temporary-participant Thing } \sqsubseteq \text{ perdurant}$

$\top \sqsubseteq \forall \text{ temporary-participant } \text{endurant}$

### **temporary-participant-in**

$\sqsubseteq \text{ participant-in}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-participant}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlparticipant-in}_i^-$

$\exists \text{ temporary-participant-in Thing } \sqsubseteq \text{ endurant}$

$\top \sqsubseteq \forall \text{ temporary-participant-in } \text{perdurant}$

### **temporary-proper-part**

$\sqsubseteq \text{ temporary-part}$

$\sqsubseteq \text{ proper-part}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlproper-part-of}_i^-$

$\exists \text{ temporary-proper-part Thing } \sqsubseteq \text{ endurant}$

$\top \sqsubseteq \forall \text{ temporary-proper-part } \text{endurant}$

### **temporary-proper-part-of**

$\sqsubseteq \text{ temporary-part-of}$

$\sqsubseteq \text{ proper-part-of}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltemporary-proper-part}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlproper-part-of}_i^-$

$\exists \text{ temporary-proper-part-of Thing } \sqsubseteq \text{ endurant}$

$\top \sqsubseteq \forall \text{ temporary-proper-part-of } \text{endurant}$

### **time-of-q-presence-of**

$\sqsubseteq \text{ mediated-relation-i}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltime-of-q-presence-of}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlpresent-at}_i^-$

$\exists \text{ time-of-q-presence-of Thing } \sqsubseteq \text{ time-interval}$

$\top \sqsubseteq \forall \text{ time-of-q-presence-of } \text{physical-quality}$

### **total-constant-participant**

$\sqsubseteq \text{ constant-participant}$

$\text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant}_i \equiv \text{[http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in}_i^-$

$\exists \text{ total-constant-participant Thing } \sqsubseteq \text{ perdurant}$

$\top \sqsubseteq \forall \text{ total-constant-participant } \text{endurant}$

### **total-constant-participant-in**

$\sqsubseteq$  constant-participant-in

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-constant-participant-in} \}^{-}$

$\exists$  total-constant-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  total-constant-participant-in perdurant

### **total-temporary-participant**

$\sqsubseteq$  temporary-participant

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \}^{-}$

$\exists$  total-temporary-participant Thing  $\sqsubseteq$  perdurant

$\top \sqsubseteq \forall$  total-temporary-participant endurant

### **total-temporary-participant-in**

$\sqsubseteq$  temporary-participant-in

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owltotal-temporary-participant-in} \}^{-}$

$\exists$  total-temporary-participant-in Thing  $\sqsubseteq$  endurant

$\top \sqsubseteq \forall$  total-temporary-participant-in perdurant

### **weak-connection**

$\sqsubseteq$  immediate-relation

$\{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlweak-connection} \} \equiv \{ \text{http://www.loa-cnr.it/ontologies/DOLCE-Lite.owlweak-connection} \}^{-}$

$\exists$  weak-connection Thing  $\sqsubseteq$  particular

$\top \sqsubseteq \forall$  weak-connection particular

## **Data properties**

### **Individuals**

### **Datatypes**

**string**