

# Description logic view: GFO-basic-QL

## Classes

### Abstract

Abstract  $\sqsubseteq$  Individual  
Abstract  $\sqsubseteq \neg$  Space\_time  
Abstract  $\sqsubseteq \neg$  Concrete

### Amount\_of\_substrate

Amount\_of\_substrate  $\sqsubseteq$  Presential

### Category

Category  $\sqsubseteq \neg$  Individual

### Change

Change  $\sqsubseteq$  Occurrent  
Change  $\sqsubseteq \neg$  Event  
Change  $\sqsubseteq \neg$  History

### Chronoid

Chronoid  $\sqsubseteq$  Temporal\_region

### Concept

Concept  $\sqsubseteq$  Category  
Concept  $\sqsubseteq \neg$  Universal  
Concept  $\sqsubseteq \neg$  Symbol\_structure

### Concrete

Concrete  $\sqsubseteq$  Individual  
Concrete  $\sqsubseteq \neg$  Space\_time  
Concrete  $\sqsubseteq \neg$  Abstract

### Continuous\_change

Continuous\_change  $\sqsubseteq$  Change  
Continuous\_change  $\sqsubseteq \neg$  Discrete\_change

### Continuous\_process

Continuous\_process  $\sqsubseteq$  Process

### **Discrete<sub>change</sub>**

Discrete\_change  $\sqsubseteq$  Change

Discrete\_change  $\sqsubseteq \neg$  Continuous\_change

### **Discrete<sub>process</sub>**

Discrete\_process  $\sqsubseteq$  Process

### **Entity**

Entity  $\equiv$  Thing

### **Event**

Event  $\sqsubseteq$  Occurrent

Event  $\sqsubseteq \neg$  History

Event  $\sqsubseteq \neg$  Change

### **History**

History  $\sqsubseteq$  Occurrent

History  $\sqsubseteq \neg$  Event

History  $\sqsubseteq \neg$  Change

### **Individual**

Individual  $\sqsubseteq \neg$  Category

### **Left<sub>time</sub>boundary**

Left\_time\_boundary  $\sqsubseteq$  Time\_boundary

Left\_time\_boundary  $\sqsubseteq \neg$  Right\_time\_boundary

### **Line**

Line  $\sqsubseteq$  Spatial\_boundary

### **Material<sub>boundary</sub>**

Material\_boundary  $\sqsubseteq$  Presential

Material\_boundary  $\sqsubseteq \exists$  framed\_by Spatial\_boundary

Material\_boundary  $\sqsubseteq \neg$  Material\_object

### **Material<sub>object</sub>**

Material\_object  $\sqsubseteq \exists$  framed\_by Topoid

Material\_object  $\sqsubseteq$  Presential

Material\_object  $\sqsubseteq \neg$  Material\_boundary

### **Occurrent**

Occurrent  $\sqsubseteq$  Processual\_Structure

Occurrent  $\sqsubseteq$   $\neg$  Process

### **Perpetuant**

Perpetuant  $\sqsubseteq$  Concrete

### **Point**

Point  $\sqsubseteq$  Spatial\_boundary

### **Presential**

Presential  $\sqsubseteq$  Concrete

Presential  $\sqsubseteq$   $\neg$  Processual\_Structure

### **Process**

Process  $\sqsubseteq$  Processual\_Structure

Process  $\sqsubseteq$   $\neg$  Occurrent

### **Processual<sub>s</sub>structure**

Processual\_Structure  $\sqsubseteq$  Concrete

Processual\_Structure  $\sqsubseteq$   $\neg$  Presential

### **Processual<sub>r</sub>ole**

Processual\_role  $\sqsubseteq$  Role

Processual\_role  $\sqsubseteq$  Process

Processual\_role  $\sqsubseteq$   $\neg$  Social\_role

Processual\_role  $\sqsubseteq$   $\neg$  Relational\_role

### **Property**

Property  $\sqsubseteq$  Individual

Property  $\sqsubseteq$   $\neg$  Relator

### **Relational<sub>r</sub>ole**

Relational\_role  $\sqsubseteq$  Property

Relational\_role  $\sqsubseteq$  Role

Relational\_role  $\sqsubseteq$   $\neg$  Social\_role

Relational\_role  $\sqsubseteq$   $\neg$  Processual\_role

## **Relator**

Relator  $\sqsubseteq$  Individual  
Relator  $\sqsubseteq \neg$  Property

## **Right<sub>time</sub>boundary**

Right\_time\_boundary  $\sqsubseteq$  Time\_boundary  
Right\_time\_boundary  $\sqsubseteq \neg$  Left\_time\_boundary

## **Role**

Role  $\sqsubseteq$  Individual

## **Social<sub>role</sub>**

Social\_role  $\sqsubseteq$  Role  
Social\_role  $\sqsubseteq \neg$  Relational\_role  
Social\_role  $\sqsubseteq \neg$  Processual\_role

## **Space**

Space  $\sqsubseteq$  Space\_time  
Space  $\sqsubseteq \neg$  Time

## **Space<sub>time</sub>**

Space\_time  $\sqsubseteq$  Individual  
Space\_time  $\sqsubseteq \neg$  Abstract  
Space\_time  $\sqsubseteq \neg$  Concrete

## **Spatial<sub>boundary</sub>**

Spatial\_boundary  $\sqsubseteq$  Space  
Spatial\_boundary  $\sqsubseteq \neg$  Spatial\_region

## **Spatial<sub>region</sub>**

Spatial\_region  $\sqsubseteq$  Space  
Spatial\_region  $\sqsubseteq \neg$  Spatial\_boundary

## **State**

State  $\sqsubseteq$  Process

## **Surface**

Surface  $\sqsubseteq$  Spatial\_boundary

### **Symbol**<sub>structure</sub>

Symbol\_structure  $\sqsubseteq$  Category  
Symbol\_structure  $\sqsubseteq$   $\neg$  Concept  
Symbol\_structure  $\sqsubseteq$   $\neg$  Universal

### **Temporal**<sub>region</sub>

Temporal\_region  $\sqsubseteq$  Time  
Temporal\_region  $\sqsubseteq$   $\neg$  Time\_boundary

### **Thing**

Thing  $\equiv$  Entity

### **Time**

Time  $\sqsubseteq$  Space\_time  
Time  $\sqsubseteq$   $\neg$  Space

### **Time**<sub>boundary</sub>

Time\_boundary  $\sqsubseteq$  Time  
Time\_boundary  $\sqsubseteq$   $\neg$  Temporal\_region

### **Topoid**

Topoid  $\sqsubseteq$  Spatial\_region

### **Universal**

Universal  $\sqsubseteq$  Category  
Universal  $\sqsubseteq$   $\neg$  Concept  
Universal  $\sqsubseteq$   $\neg$  Symbol\_structure

## **Object properties**

**abstract**<sub>haspart</sub>

**coincides**<sub>with</sub>

coincides\_with  $\equiv$  coincides\_with<sup>-</sup>

**exhibits**

$\exists$  exhibits Thing  $\sqsubseteq$  Perpetuant  
 $\top$   $\sqsubseteq$   $\forall$  exhibits Presential

### **framed<sub>by</sub>**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlframes}_i \equiv \{ \text{http://www.onto-med.de/ontologies/gfo.owlframed}_by >^-$   
 $\exists \text{ framed\_by Thing} \sqsubseteq \text{Presential}$   
 $\top \sqsubseteq \forall \text{ framed\_by Space}$

### **frames**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlframes}_i \equiv \{ \text{http://www.onto-med.de/ontologies/gfo.owlframed}_by >^-$   
 $\exists \text{ frames Thing} \sqsubseteq \text{Space}$   
 $\top \sqsubseteq \forall \text{ frames Presential}$

### **has<sub>p</sub>participant**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlhas}_p\text{participant} > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owlpart}$   
 $\exists \text{ has\_participant Thing} \sqsubseteq \text{Processual\_Structure}$   
 $\top \sqsubseteq \forall \text{ has\_participant } \neg \text{Processual\_Structure}$   
 $\top \sqsubseteq \forall \text{ has\_participant } \neg \text{Space\_time}$

### **has<sub>r</sub>ole**

$\sqsubseteq \text{abstract\_has\_part}$   
 $\exists \text{ has\_role Thing} \sqsubseteq \text{Entity}$   
 $\top \sqsubseteq \forall \text{ has\_role Role}$

### **has<sub>t</sub>oken**

$\sqsubseteq \text{instantiated\_by}$   
 $\{ \text{http://www.onto-med.de/ontologies/gfo.owlhas}_t\text{oken} > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owltoken}_of$   
 $\exists \text{ has\_token Thing} \sqsubseteq \text{Symbol\_structure}$   
 $\top \sqsubseteq \forall \text{ has\_token Concrete}$

### **instance<sub>of</sub>**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlinstantiated}_by > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owlins}$   
 $\exists \text{ instance\_of Thing} \sqsubseteq \text{Entity}$   
 $\top \sqsubseteq \forall \text{ instance\_of Category}$

### **instantiated<sub>by</sub>**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlinstantiated}_by > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owlins}$   
 $\exists \text{ instantiated\_by Thing} \sqsubseteq \text{Category}$   
 $\top \sqsubseteq \forall \text{ instantiated\_by Entity}$

### **participates<sub>in</sub>**

$\{ \text{http://www.onto-med.de/ontologies/gfo.owlhas}_p\text{participant} > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owlpart}$   
 $\exists \text{ participates\_in Thing} \sqsubseteq \neg \text{Space\_time}$

$\exists$  participates\_in Thing  $\sqsubseteq$   $\neg$ Processual\_Structure  
 $\top \sqsubseteq \forall$  participates\_in Processual\_Structure

### **token\_of**

$\sqsubseteq$  instance\_of  
 $\{ \text{http://www.onto-med.de/ontologies/gfo.owlhas\_token} > \equiv < \text{http://www.onto-med.de/ontologies/gfo.owltoken\_of} \}$   
 $\exists$  token\_of Thing  $\sqsubseteq$  Concrete  
 $\top \sqsubseteq \forall$  token\_of Symbol\_structure

## **Data properties**

### **Individuals**

### **Datatypes**

PlainLiteral

string