Simulation

// Metadata

Name	Simulation
Keywords	Simulation
Creation date	November 22th, 2012
Has contributor	Bernard Gibaud, Germain Forestier
Used ontology engineering methodology	OntoSpec
Is of type	Domain ontology
Natural language	English
Has ontology language	OntoSpec
Has formality level	Semi informal
Has reference	
Resource locator	
Version	1.3
Number of concepts (classes)	21
Number of relations (properties)	8

Note: the document introduces first the relations defined in this ontology, then the concepts (i.e. the classes). Diagrams provide synthetic views of taxonomies. In those diagrams, links represent subsumption links (i.e. « is a » relationships), unless some other meaning is mentioned explicitly (in italics). Lines crossing two or more subsumption links depict a constraint of disjointness between the specialized classes.

// Relations

// Object properties

Derives from
Properties
  [EP/DR & RR] An ENDURANT *derives from* an ENDURANT.
Comment
  An Endurant derives from another Endurant iff the latter was used as a data in some Perdurant (relation *is a data of at*) that resulted in the creation of the former (relation *is a result of at*).

Is used to derive
Properties
  [EP/DR & RR] An ENDURANT *is used to derive* an ENDURANT. [EP/IVL] *Is used to derive* mutually implies *derives from*.
Comment
An Endurant is used to derive another Endurant iff the former was used as a data in some Perdurant (relation *is a data of at*) that resulted in the creation of the latter (relation *is a result of at*).

Derives from model
Properties
  [EP/DR & RR] An ENDURANT *derives from model* a MEDICAL IMAGE SIMULATION OBJECT MODEL. [EP/SL] x *derives from model* y implies that x *derives from* y.
Comment
  An Endurant derives from model a medical image simulation model iff this model was used as a

data in a medical image simulation process to create this endurant.

Is a model used to derive

Properties

[EP/DR & RR] A MEDICAL IMAGE SIMULATION OBJECT MODEL *is a model used to derive* an ENDURANT. [EP/SL] x *is a model used to derive* y implies that x *is used to derive* y. [EP/IVL] *Is a model used to derive* mutually implies *derives from model*.

Comment

A medical image simulation object model is a model used to derive an Endurant iff this model was used as a data in some medical image simulation process (relation *is a data of at*) that resulted in the creation of this Endurant (relation *is a result of at*).

Derives from parameter set

Properties

[EP/DR & RR] An ENDURANT *derives from parameter set* a SIMULATION PARAMETER SET. [EP/SL] x *derives from parameter set* y implies that x *derives from* y.

Comment

An Endurant derives from parameter set a simulation parameter set iff this simulation parameter set was used as a data in a medical image simulation process to create this endurant.

Is a parameter set used to derive

Properties

[EP/DR & RR] A SIMULATION PARAMETER SET *is a parameter set used to derive* an ENDURANT. [EP/SL] x *is a parameter set used to derive* y implies that x *is used to derive* y. [EP/IVL] *Is a parameter set used to derive* mutually implies *derives from parameter set*.

Comment

A simulation parameter set is a parameter set used to derive an Endurant iff this parameter set was used as a data in some medical image simulation process (relation *is a data of at*) that resulted in the creation of this Endurant (relation *is a result of at*).

Derives from parameter value

Properties

[EP/DR & RR] An ENDURANT *derives from parameter value* a SIMULATION PARAMETER. [EP/SL] x *derives from parameter value* y implies that x *derives from* y.

Comment

An Endurant derives from parameter value a simulation parameter iff this simulation parameter was used as a data in a medical image simulation process to create this endurant.

Is a parameter value used to derive

Properties

[EP/DR & RR] A SIMULATION PARAMETER *is a parameter value used to derive* an ENDURANT. [EP/SL] x *is a parameter value used to derive* y implies that x *is used to derive* y. [EP/IVL] *Is a parameter value used to derive* mutually implies *derives from parameter value*.

Comment

A simulation parameter is a parameter value used to derive an Endurant iff this simulation parameter was used as a data in some medical image simulation process (relation *is a data of at*) that resulted in the creation of this Endurant (relation *is a result of at*).

// Concepts
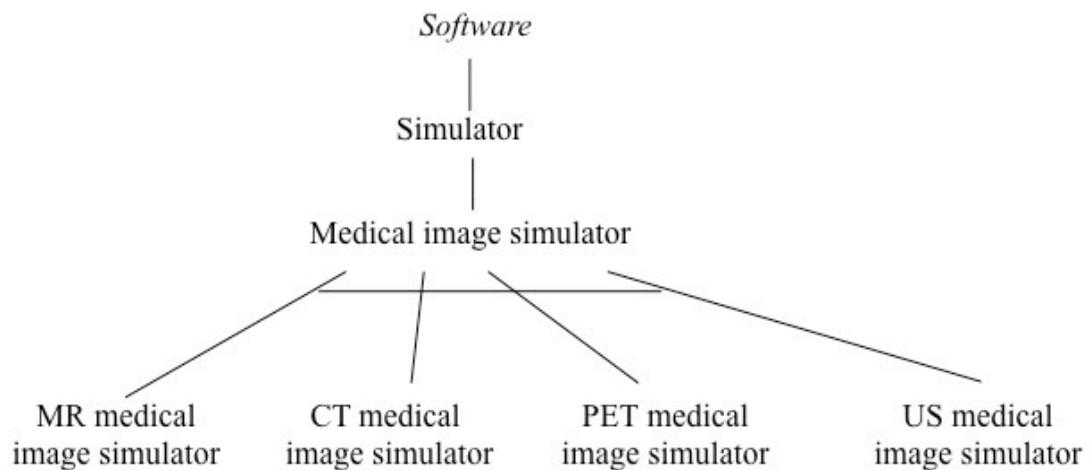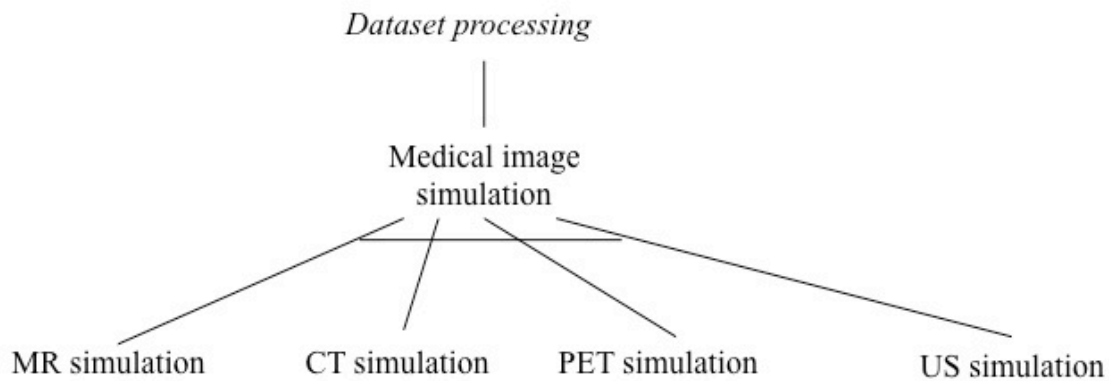
Medical image simulation, simulation

Meta Properties

MR SIMULATION, CT SIMULATION, PET SIMULATION and US SIMULATION and *is a disjunctive sub-division of* MEDICAL IMAGE SIMULATION.

Properties

[EP/SL] A MEDICAL IMAGE SIMULATION is a DATASET PROCESSING. [EP/ER] A MEDICAL IMAGE SIMULATION *has for data* exactly one MEDICAL IMAGE SIMULATION OBJECT MODEL *at* a TIME INTERVAL. [EP/ER] A MEDICAL IMAGE SIMULATION *has for result* some SIMULATED DATA *at* a TIME INTERVAL. A MEDICAL IMAGE SIMULATION *has for instrument* some MEDICAL IMAGE SIMULATOR *at* a TIME INTERVAL.

Comment

[DEF] A medical image simulation is a dataset processing consisting in calculating medical images representing an object (usually a biological object, but it can also be a geometric phantom) from a model of this object. The calculations involved in this process include the simulation of the physical phenomena that occur during a real image image acquisition using an imaging equipment (e.g. emission of photons and interactions with the imaged object and the detector).

MR simulation

Meta Properties

Properties

[EP/SL] An MR SIMULATION is a MEDICAL IMAGE SIMULATION. [EP/ER] A MR SIMULATION *has for result* some MR SIMULATED DATA *at* a TIME INTERVAL. A MR SIMULATION *has for instrument* some MR MEDICAL IMAGE SIMULATOR *at* a TIME INTERVAL.

Comment

[DEF] MR simulations are Medical image simulations aiming at creating MR simulated data.

CT simulation

Meta Properties

Properties

[EP/SL] A CT SIMULATION is a MEDICAL IMAGE SIMULATION. [EP/ER] A CT SIMULATION *has for result* some CT SIMULATED DATA *at* a TIME INTERVAL. A CT SIMULATION *has for instrument* some CT MEDICAL IMAGE SIMULATOR *at* a TIME INTERVAL.

Comment

[DEF] CT simulations are Medical image simulations aiming at creating CT simulated data.

PET simulation

Meta Properties

Properties

[EP/SL] A PET SIMULATION is a MEDICAL IMAGE SIMULATION. [EP/ER] A PET SIMULATION *has for result* some PET SIMULATED DATA *at* a TIME INTERVAL. A PET SIMULATION *has for instrument* some PET MEDICAL IMAGE SIMULATOR *at* a TIME INTERVAL.

Comment

[DEF] PET simulations are Medical image simulations aiming at creating PET simulated data.

US simulation

Meta Properties

Properties

[EP/SL] An US SIMULATION is a MEDICAL IMAGE SIMULATION. [EP/ER] An US SIMULATION *has for result* some US SIMULATED DATA *at* a TIME INTERVAL. An US SIMULATION *has for instrument* some US MEDICAL IMAGE SIMULATOR *at* a TIME INTERVAL.

Comment

[DEF] US simulations are Medical image simulations aiming at creating US simulated data.

Simulator

Meta Properties

Properties

[EP/SL] A SIMULATOR is a SOFTWARE.

Comment

[DEF] A simulator is a software dedicated to simulation.

Medical image simulator

Meta Properties

MR MEDICAL IMAGE SIMULATOR, CT MEDICAL IMAGE SIMULATOR, PET MEDICAL IMAGE SIMULATOR and US MEDICAL IMAGE SIMULATOR and *is a disjunctive sub-division of* MEDICAL IMAGE SIMULATOR.

Properties

[EP/SL] A MEDICAL IMAGE SIMULATOR is a SIMULATOR.

Comment

[DEF] A medical image simulator is a simulator dedicated to the simulation of Medical images.

MR Medical image simulator

Meta Properties

Properties

[EP/SL] An MR MEDICAL IMAGE SIMULATOR is a MEDICAL IMAGE SIMULATOR.

Comment

[DEF] An MR medical image simulator is a simulator dedicated to the simulation of MR simulated data.

CT Medical image simulator

Meta Properties

Properties

[EP/SL] A CT MEDICAL IMAGE SIMULATOR is a MEDICAL IMAGE SIMULATOR.

Comment

[DEF] A CT medical image simulator is a simulator dedicated to the simulation of CT simulated data.

PET Medical image simulator

Meta Properties

Properties

[EP/SL] A PET MEDICAL IMAGE SIMULATOR is a MEDICAL IMAGE SIMULATOR.

Comment

[DEF] A PET medical image simulator is a simulator dedicated to the simulation of PET simulated data.

US Medical image simulator

Meta Properties

Properties

[EP/SL] An US MEDICAL IMAGE SIMULATOR is a MEDICAL IMAGE SIMULATOR.

Comment

[DEF] An US medical image simulator is a simulator dedicated to the simulation of US simulated data.
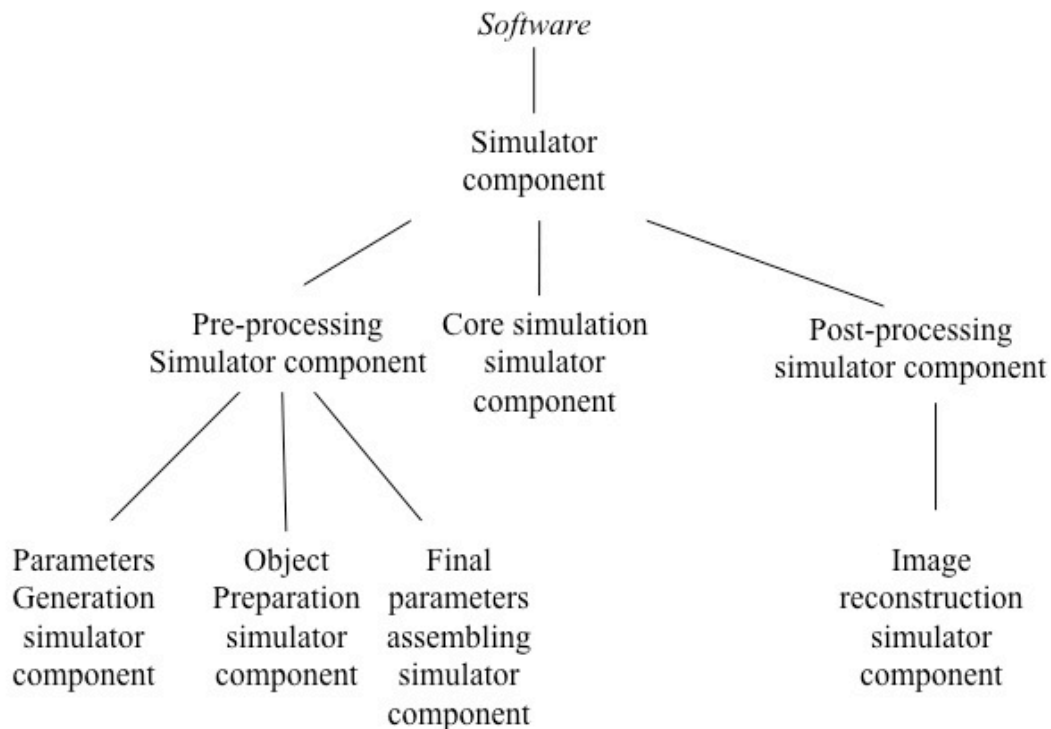
Simulator component
Meta Properties
Properties
[EP/SL] A SIMULATOR COMPONENT is a SOFTWARE. [EP/ER] A SIMULATOR COMPONENT *is a part of* some SIMULATOR *during* a TIME INTERVAL.
Comment
[DEF] A simulator component is a software achieving some of the processing involved in simulation.

Pre-processing simulator component
Meta Properties
Properties
[EP/SL] A PRE-PROCESSING SIMULATOR COMPONENT is a SIMULATOR COMPONENT.
Comment
[DEF] A pre-processing simulator component is a simulator component achieving some pre-processing of simulation.

Core simulation simulator component
Meta Properties
Properties
[EP/SL] A CORE SIMULATION SIMULATOR COMPONENT is a SIMULATOR COMPONENT.
Comment
[DEF] A core simulation simulator component is a simulator component achieving some core

simulation.

Post-processing simulator component
Meta Properties
Properties
[EP/SL] A POST-PROCESSING SIMULATOR COMPONENT is a SIMULATOR COMPONENT.
Comment
[DEF] A post-processing simulator component is a simulator component achieving some post-processing of simulation.

Parameters generation simulator component
Meta Properties
Properties
[EP/SL] A PARAMETERS GENERATION SIMULATOR COMPONENT is a PRE-PROCESSING SIMULATOR COMPONENT.
Comment
[DEF] A parameters generation simulator component is a pre-processing simulator component achieving some generation of simulation parameters.

Object preparation simulator component
Meta Properties
Properties
[EP/SL] An OBJECT PREPARATION SIMULATOR COMPONENT is a PRE-PROCESSING SIMULATOR COMPONENT.
Comment
[DEF] An object preparation simulator component is a pre-processing simulator component achieving some object preparation.

Final parameters assembling simulator component
Meta Properties
Properties
[EP/SL] A FINAL PARAMETERS ASSEMBLING SIMULATOR COMPONENT is a PRE-PROCESSING SIMULATOR COMPONENT.
Comment
[DEF] A final parameters assembling simulator component is a pre-processing simulator component achieving some final assembling of simulation parameters.

Image reconstruction simulator component
Meta Properties
Properties
[EP/SL] An IMAGE RECONSTRUCTION SIMULATOR COMPONENT is a POST-PROCESSING SIMULATOR COMPONENT.
Comment
[DEF] An image reconstruction simulator component is a post-processing simulator component achieving some image reconstruction.

Simulation parameter
Meta Properties
Properties
[EP/SL] A SIMULATION PARAMETER is an INFORMATION.

Comment

[DEF] A simulation parameter is an information used as a data in a medical image simulation process.

Simulation parameter set

Meta Properties

Properties

[EP/SL] A SIMULATION PARAMETER SET is a PROTOCOL.

Comment

[DEF] A simulation parameter set is a protocol that specifies many parameters to be used or used in a medical image simulation process.