

Онтология на основните стилове в изобразителното изкуство и техните отличителни картини

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Атомарни концепти

- **Artwork** - произведение на изкуството
- **Age** - епоха в човешкото развитие
- **Style** - стил в изобразителното изкуство
- **Artist** - художник, нарисувал картината
- **Region** - регион на света, където е работил художникът
- **Medium** - средство за изобразяване
- **Depiction** - какво изобразява картината
- **Museum** - музей, в който се помещава картината днес

Атомарни подконцепти

Paint \sqsubseteq Medium
Landscape \sqsubseteq Depiction

Неатомарни концепти

Painting \doteq [AND Artwork, [EXISTS 1 :depicts], [EXISTS 1 :hasMedium]]
OilPainting \doteq [AND Painting, [FILLS :hasMedium, OilPaint]]
AcrylicPainting \doteq [AND Painting, [FILLS :hasMedium, AcrylicPaint]]
HistoricalEventPainting \doteq [AND Painting, [FILLS :depicts, HistoricalEvent]]
PortraitPainting \doteq [AND Painting, [FILLS :depicts, Portrait]]
LandscapePainting \doteq [AND Painting, [ALL :depicts, Landscape]]
PortraitOilPainting \doteq [AND OilPainting, PortraitPainting]

Роли

belongsTo : Style \rightarrow Age
represents : Artwork \rightarrow Style
createdBy : Artwork \rightarrow Artist
housedIn : Artwork \rightarrow Museum
locatedIn : Museum \rightarrow Region
negativeReactionTo : Style \rightarrow Style
positiveReactionTo : Style \rightarrow Style
 depicts : Painting \rightarrow Depiction
usesMedium : Painting \rightarrow Medium
 livedIn : Artist \rightarrow Region
precededBy : Age \rightarrow Age
succeededBy : Age \rightarrow Age.

belongsTo(*Paleolithic, PrehistoricAge*)

belongsTo(*Neolithic, PrehistoricAge*)

belongsTo(*AncientEgyptian, Antiquity*)

belongsTo(*AncientGreek, Antiquity*)

positiveReactionTo(*AncientGreek, AncientEgyptian*)

belongsTo(*Roman, Antiquity*)

positiveReactionTo(*Roman, AncientGreek*)

belongsTo(*Byzantine, MiddleAges*)

belongsTo(*Romanesque, MiddleAges*)

belongsTo(*Gothic, GothicAge*)

positiveReactionTo(*Gothic, Romanesque*)

belongsTo(*ItalianRenaissance, Renaissance*)

negativeReactionTo(*ItalianRenaissance, Gothic*)

belongsTo(*NordicRenaissance, Renaissance*)

belongsTo(*Baroque, NewAge*)

negativeReactionTo(*Baroque, Renaissance*)

belongsTo(*Rococo, NewAge*)

negativeReactionTo(*Rococo, Baroque*)

belongsTo(*Classicism, NewAge*)

negativeReactionTo(*Classicism, Rococo*)

belongsTo(*Romanticism, NewAge*)

belongsTo(*Realism, ModernAge*)

negativeReactionTo(*Realism, Romanticism*)

belongsTo(*Impressionism, ModernAge*)

negativeReactionTo(*Impressionism, Realism*)

belongsTo(*PostImpressionism, ModernAge*)

positiveReactionTo(*PostImpressionism, Impressionism*)

belongsTo(*Expressionism, ModernAge*)

negativeReactionTo(*Expressionism, Realism*)

От тях *precededBy* и *succeededBy* са противоположни и транзитивни, а *createdBy* и *housedIn* са функционални.

Константи

- **Artwork**

Michelangelo → Artist

David → Artwork

livedIn(Michelangelo, WesternEurope)

createdBy(David, Michelangelo)

represents(David, ItalianRenaissance)

housedIn(David, GalleriaDellAccademia)

- **Age**

PrehistoricAge → Age

Antiquity → Age

MiddleAges → Age

GothicAge → Age

Renaissance → Age

NewAge → Age

ModernAge → Age

ContemporaryAge → Age

- **Style**

Paleolithic → Style
Neolithic → Style
AncientEgyptian → Style
AncientGreek → Style
Roman → Style
Byzantine → Style
Romanesque → Style
Gothic → Style
ItalianRenaissance → Style
NordicRenaissance → Style
Baroque → Style
Rococo → Style
Classicism → Style
Romanticism → Style
Realism → Style
Impressionism → Style
PostImpressionism → Style
Expressionism → Style
Cubism → Style
Futurism → Style
Dadaism → Style
Surrealism → Style
PopArt → Style
ConceptualArt → Style

- **Medium**

Chalk → Medium
Graphite → Medium

- **Paint** ⊑ Medium

OilPaint → Paint
AcrylicPaint → Paint

- **Depiction**

HistoricalEvent → Depiction
Portrait → Depiction
GroupScene → Depiction
AbstractDepiction → Depiction

- **Landscape** ⊑ Depiction

NaturalLandscape → Landscape
UrbanLandscape → Landscape

- **Region**

Asia → Region
Africa → Region
Australia → Region
NorthAmerica → Region
SouthAmerica → Region
EasternEurope → Region
WesternEurope → Region

Визуализация

Представители на изброяните стилове и епохи

Художници

- VincentVanGogh → Artist

livedIn(VincentVanGogh, WesternEurope)

- JohannesVermeer → Artist

livedIn(JohannesVermeer, WesternEurope)

- LeonardoDaVinci → Artist

livedIn(LeonardoDaVinci, WesternEurope)

- FranciscoGoya → Artist
 $livedIn(FranciscoGoya, WesternEurope)$
- AndyWarhol → Artist
 $livedIn(AndyWarhol, NorthAmerica)$
- ClaudeMonet → Artist
 $livedIn(ClaudeMonet, WesternEurope)$

Музеи

- LouvreMuseum → Museum
 $locatedIn(LouvreMuseum, WesternEurope)$
- MoMA → Museum
 $locatedIn(MoMA, NorthAmerica)$
- PradoMuseum → Museum
 $locatedIn(PradoMuseum, WesternEurope)$
- KatheKollwitzMuseum → Museum
 $locatedIn(KatheKollwitzMuseum, WesternEurope)$
- BibliotecaRealeTurin → Museum
 $locatedIn(BibliotecaRealeTurin, WesternEurope)$
- Mauritshuis → Museum
 $locatedIn(Mauritshuis, WesternEurope)$

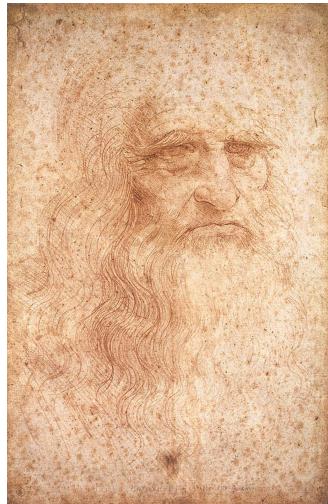
Картини

- MonaLisa → PortraitPainting, PortraitOilPainting



*createdBy(MonaLisa, LeonardoDaVinci)
depicts(MonaLisa, Portrait)
usesMedium(MonaLisa, OilPaint)
represents(MonaLisa, ItalianRenaissance)
housedIn(MonaLisa, LouvreMuseum)*

- *PortraitOfAManInRedChalk* → *PortraitPainting*



*createdBy(PortraitOfAManInRedChalk, LeonardoDaVinci)
depicts(PortraitOfAManInRedChalk, Portrait)
usesMedium(PortraitOfAManInRedChalk, Chalk)
represents(PortraitOfAManInRedChalk, ItalianRenaissance)
locatedIn(PortraitOfAManInRedChalk, BibliotecaRealeTurin)*

- *GirlWithAPearlEarring* → *PortraitOilPainting*, *PortraitPainting*



*createdBy(GirlWithAPearlEarring, JohannesVermeer)
depicts(GirlWithAPearlEarring, Portrait)
usesMedium(GirlWithAPearlEarring, OilPaint)
represents(GirlWithAPearlEarring, Baroque)
housedIn(GirlWithAPearlEarring, Mauritshuis)*

- CampbellsSoupCans → AcrylicPainting



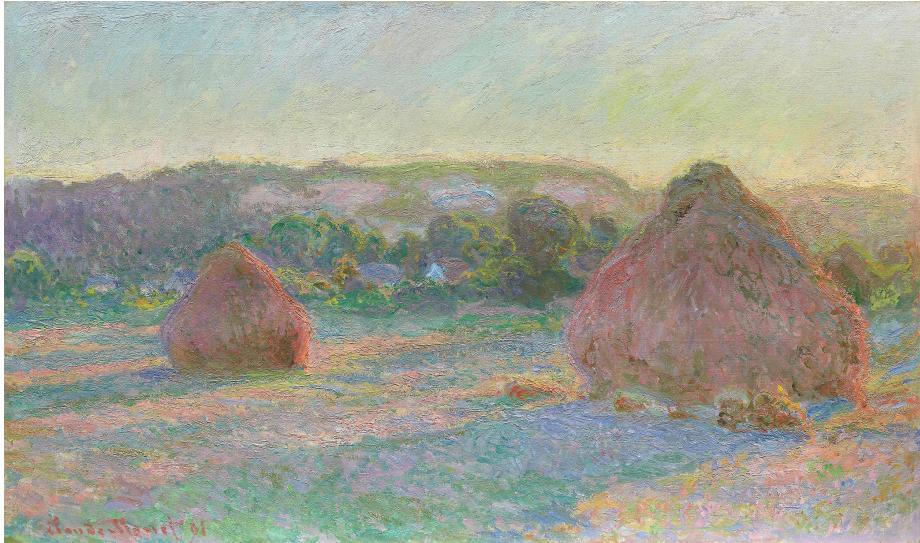
*createdBy(CampbellsSoupCans, AndyWarhol)
depicts(CampbellsSoupCans, AbstractDepiction)
usesMedium(CampbellsSoupCans, AcrylicPaint)
represents(CampbellsSoupCans, PopArt)
housedIn(CampbellsSoupCans, MoMA)
livedIn(AndyWarhol, NorthAmerica)*

- ThirdOfMay1808 → HistoricalEventPainting



*createdBy(ThirdOfMay1808, FranciscoGoya)
depicts(ThirdOfMay1808, HistoricalEvent)
usesMedium(ThirdOfMay1808, OilPaint)
represents(ThirdOfMay1808, Romanticism)
housedIn(ThirdOfMay1808, PradoMuseum)*

- Haystacks → LandscapePainting



createdBy(Haystacks, ClaudeMonet)
housedIn(Haystacks, ArtInstituteOfChicago)
depicts(Haystacks, NaturalLandscape)
represents(Haystacks, Impressionism)
usesMedium(Haystacks, OilPaint)

- StarryNightOverTheRhone → LandscapePainting



*createdBy(StarryNightOverTheRhône, VincentVanGogh)
depicts(StarryNightOverTheRhône, NaturalLandscape)
usesMedium(StarryNightOverTheRhône, OilPaint)
represents(StarryNightOverTheRhône, PostImpressionism)
housedIn(StarryNightOverTheRhône, MoMA)*

Заявки

Примерните заявки по-долу могат да бъдат изразени чрез разширение на езика \mathcal{DL} , което поддържа променливи и отрицания[1].

- Да се намери всяка картина, която е изложена в музей, разположен в регион, различен от този, където е живял художникът ѝ

MovedPainting \doteq Painting \sqcap
 $\exists \text{ createdBy} . (\text{Artist} \sqcap \exists \text{:livedIn} . ?\text{artistRegion}) \sqcap$
 $\exists \neg (\text{housedIn} . (\text{Museum} \sqcap \exists \text{:locatedIn} . ?\text{artistRegion}))$

- Да се намерят тези художници, които са изработили портрети с различни графични средства

`PortraitMaster` \doteq

$$\begin{aligned} & \text{Artist} \sqcap \\ & \exists \text{:createdBy}.(\text{Artwork} \sqcap \exists \text{:depicts.Portrait} \sqcap \exists \text{:usesMedium.}?medium1) \sqcap \\ & \exists \text{:createdBy}.(\text{Artwork} \sqcap \exists \text{:depicts.Portrait} \sqcap \exists \neg(\text{:usesMedium.}?medium2)) \end{aligned}$$

Синтаксисът на Protege не позволява променливи, но заявките могат да бъдат изразени чрез SPARQL по следния начин:

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX : <http://example.org/art_ontology.owl#>

SELECT DISTINCT ?painting
WHERE {
    ?painting rdf:type/rdfs:subClassOf* :Painting .
    ?painting :createdBy ?artist .
    ?painting :housedIn ?museum .
    ?artist :livedIn ?artistRegion .
    ?museum :locatedIn ?museumRegion .
    FILTER (?artistRegion != ?museumRegion)
}

SELECT DISTINCT ?artist
WHERE {
    ?painting1 :depicts :Portrait .
    ?painting1 :createdBy ?artist .
    ?painting1 :usesMedium ?medium .

    ?painting2 :depicts :Portrait .
    ?painting2 :createdBy ?artist .
    ?painting2 :usesMedium ?otherMedium .
    FILTER (?medium != ?otherMedium)
}

```

Литература

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