



Criteria of Geographic Relevance

Stefano De Sabbata



Geographic Relevance

Geographic Relevance (GR) is a relationship between the **user's** geographic information needs and the spatio-temporal expression of **geographic objects** in the user's surrounding environment

GeoRel Project:

- ▶ apply a relevance-based perspective to mobile context-aware geographic services

Assessment of GR:

- ▶ establish a formal method for the numerical assessment of relevance of geographic objects in mobile context-aware geographic services



Criteria of Relevance

This **relationship** is very complex and involves (at least) ...

the interests

the current activity

the location

the time schedule

the knowledge of the environment

...of the user

the category

the affordance

the location

the time validity

... of the geographic object

It is necessary

to analyse GR using an appropriate set of **criteria of relevance**.



Step 1: Literature Review

Criteria of relevance identified in

- Information Retrieval
- Geographic Information Retrieval
- Location Based Services and Systems

| Properties | Geography | Information | Presentation |
|-----------------|---------------------------|---------------|----------------------|
| topicality | spatial proximity | specificity | accessibility |
| appropriateness | temporal proximity | availability | clarity |
| coverage | spatio-temporal proximity | accuracy | tangibility |
| novelty | directionality | currency | dynamism |
| | visibility | reliability | presentation quality |
| | | verification | |
| | | affectiveness | |
| | | curiosity | |
| | | familiarity | |
| | | variety | |



Step 2: Geographic Concepts

The geographic objects ...

- ▶ do not exist as independent entities
- ▶ but rather they exist within a specific geographic context

... are commonly part of more complex geographic phenomena

described by **geographic concepts** such as:

- hierarchies (*Golledge 2002*)
- clusters (*Han et al. 2001*)
- spatial relationships (*Shekhar and Huang 2001, Koperski and Han 1995*)

which have to be taken into account.



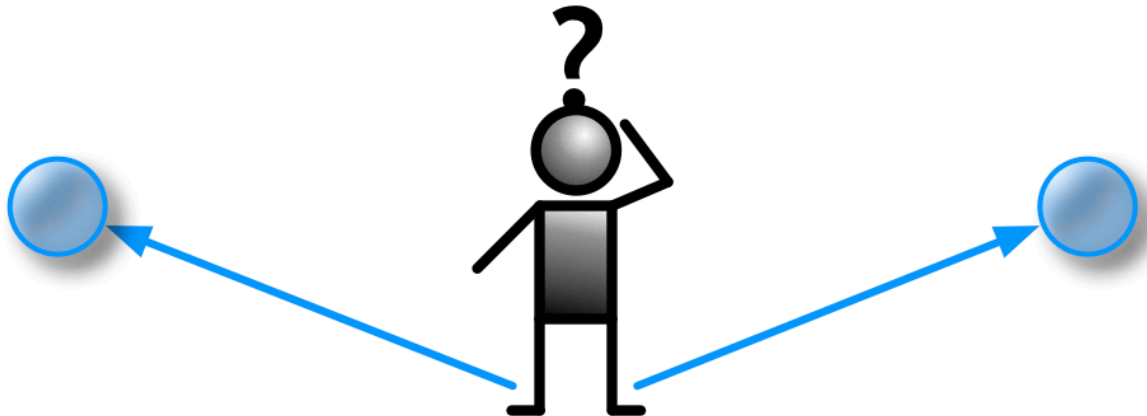
Hierarchies

Distance and relations (superior-subordinate, peers, neighbours) between the user and the geographic object within a spatial hierarchy.



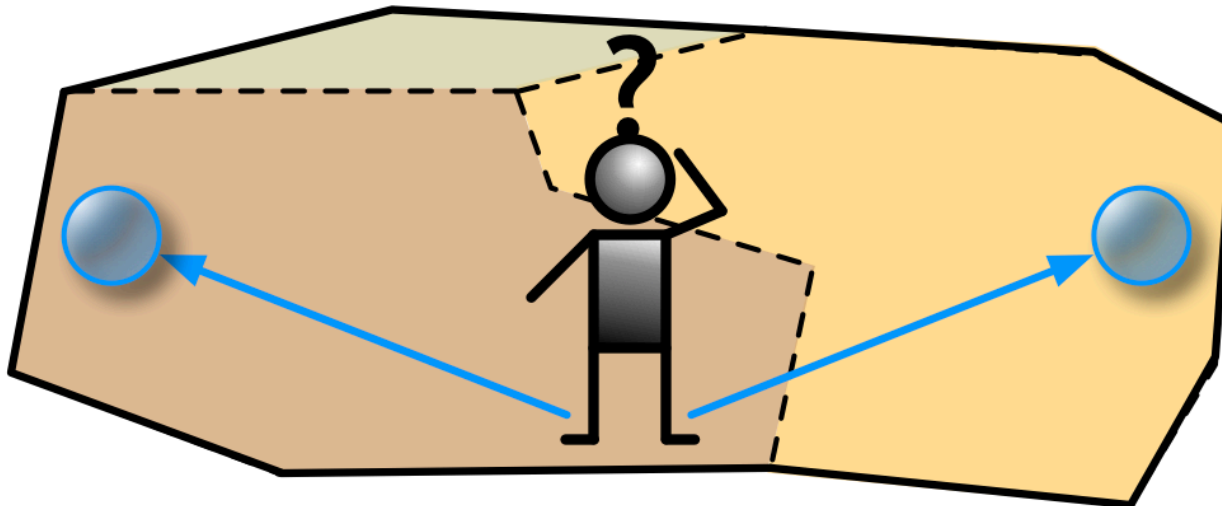
Hierarchies

Distance and relations (superior-subordinate, peers, neighbours) between the user and the geographic object within a spatial hierarchy.



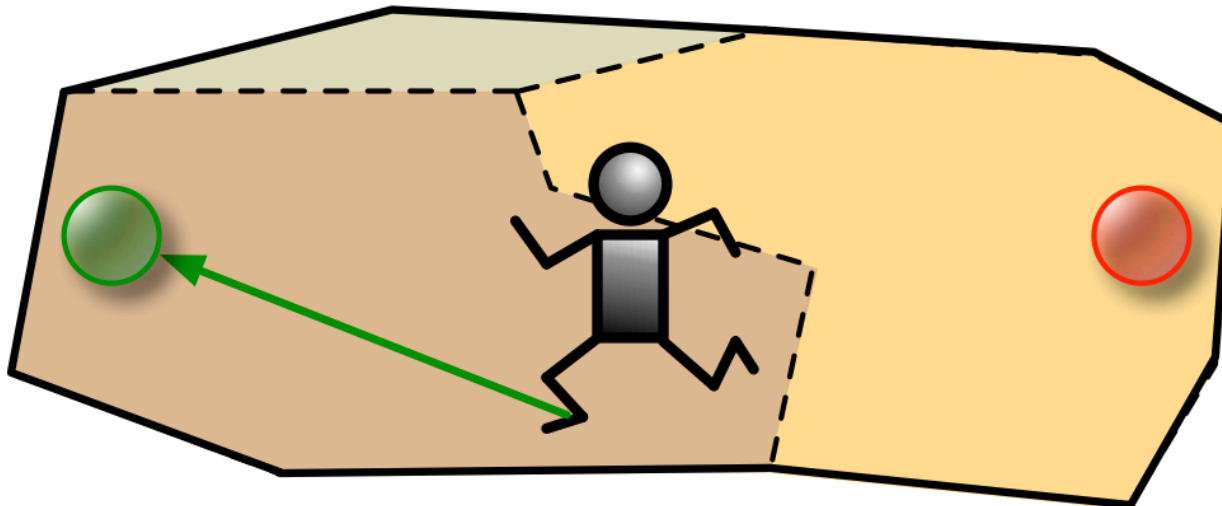
Hierarchies

Distance and relations (superior-subordinate, peers, neighbours) between the user and the geographic object within a spatial hierarchy.



Hierarchies

Distance and relations (superior-subordinate, peers, neighbours) between the user and the geographic object within a spatial hierarchy.





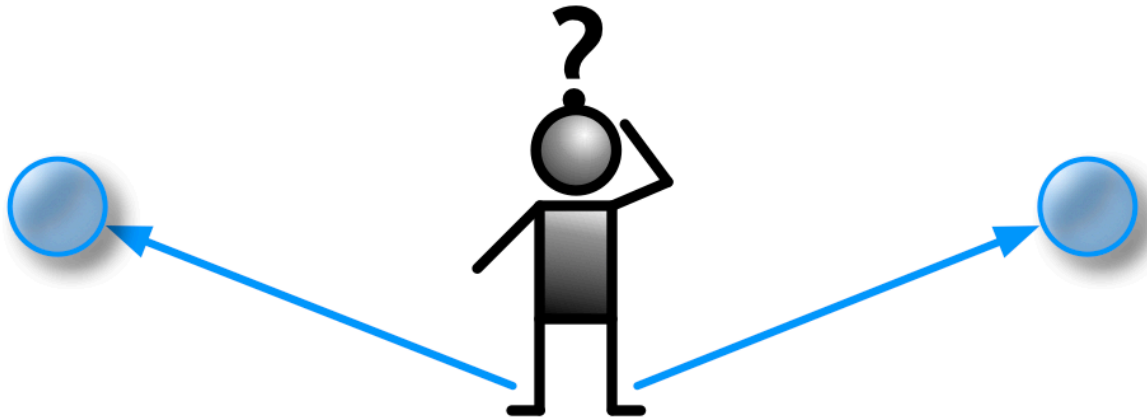
Clusters

The extent to which the object is part of one or more spatial clusters of related objects, combined with the extent to which the cluster is related to the user interests or needs.



Clusters

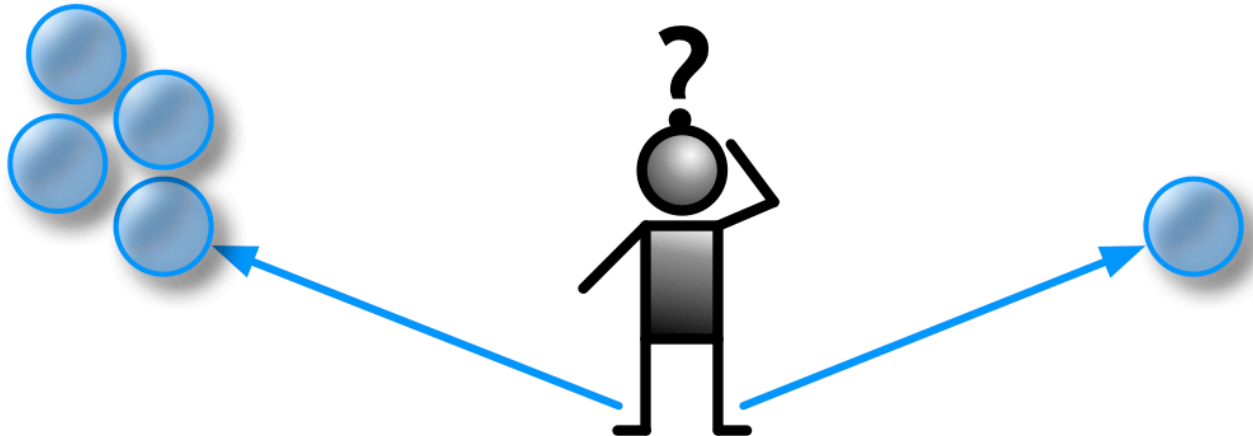
The extent to which the object is part of one or more spatial clusters of related objects, combined with the extent to which the cluster is related to the user interests or needs.





Clusters

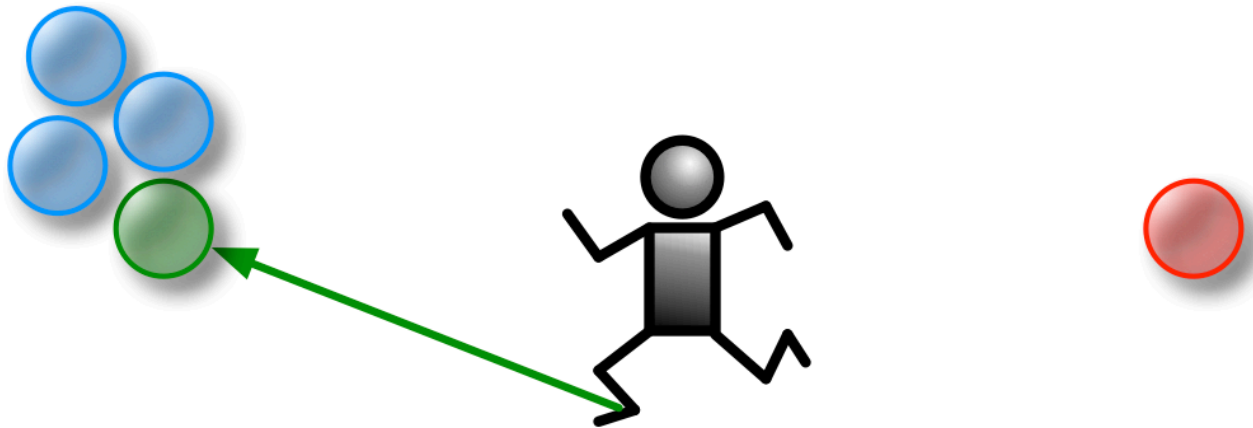
The extent to which the object is part of one or more spatial clusters of related objects, combined with the extent to which the cluster is related to the user interests or needs.





Clusters

The extent to which the object is part of one or more spatial clusters of related objects, combined with the extent to which the cluster is related to the user interests or needs.





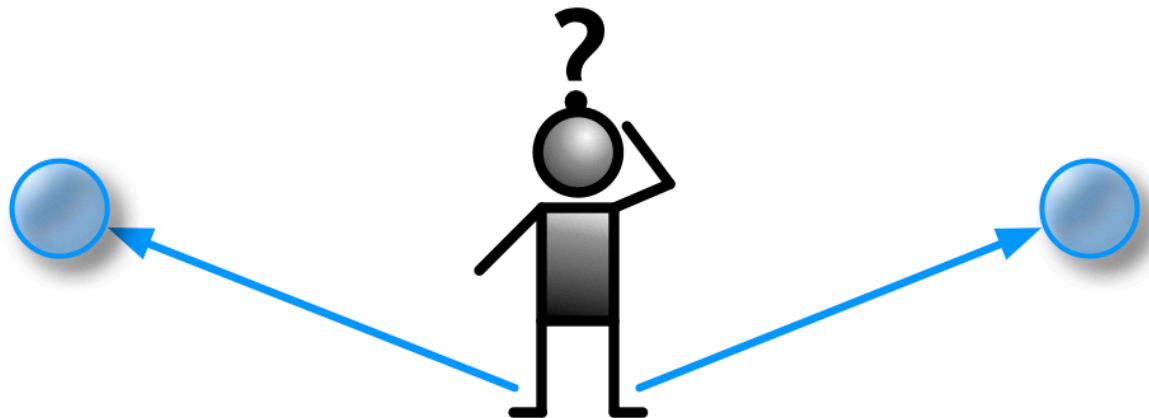
Co-location patterns

Whether a geographic object satisfies a co-location pattern, identified as common for that category of objects within a related collection of geographic objects.



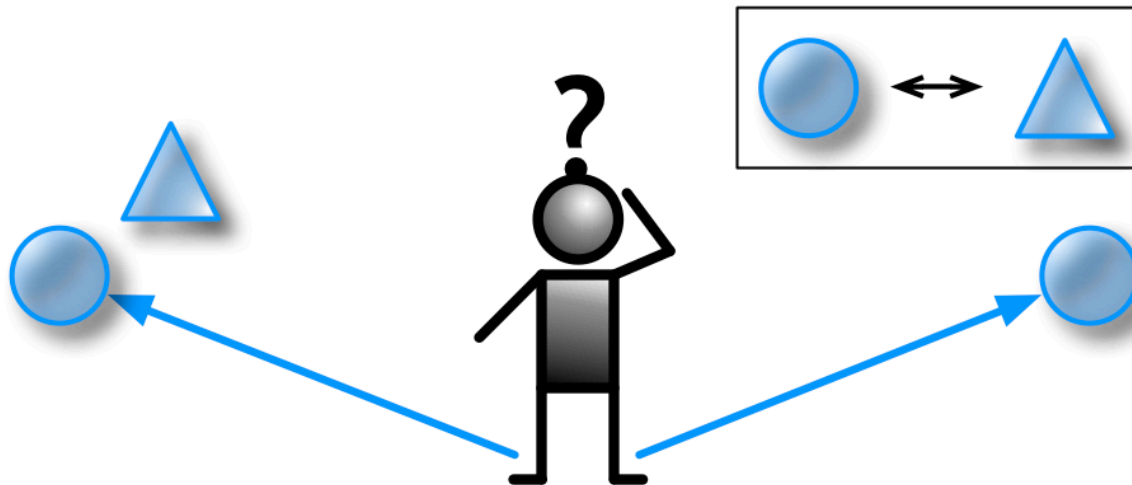
Co-location patterns

Whether a geographic object satisfies a co-location pattern, identified as common for that category of objects within a related collection of geographic objects.



Co-location patterns

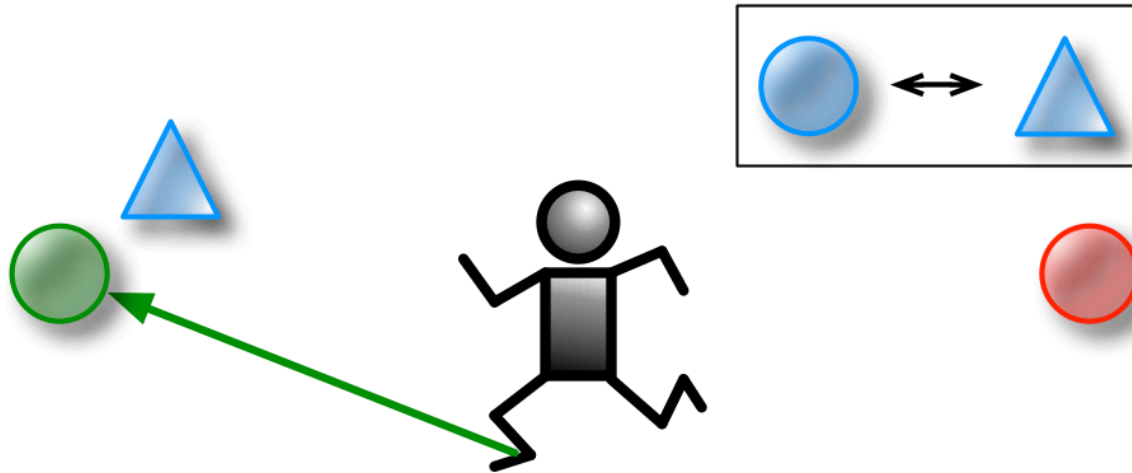
Whether a geographic object satisfies a co-location pattern, identified as common for that category of objects within a related collection of geographic objects.





Co-location patterns

Whether a geographic object satisfies a co-location pattern, identified as common for that category of objects within a related collection of geographic objects.





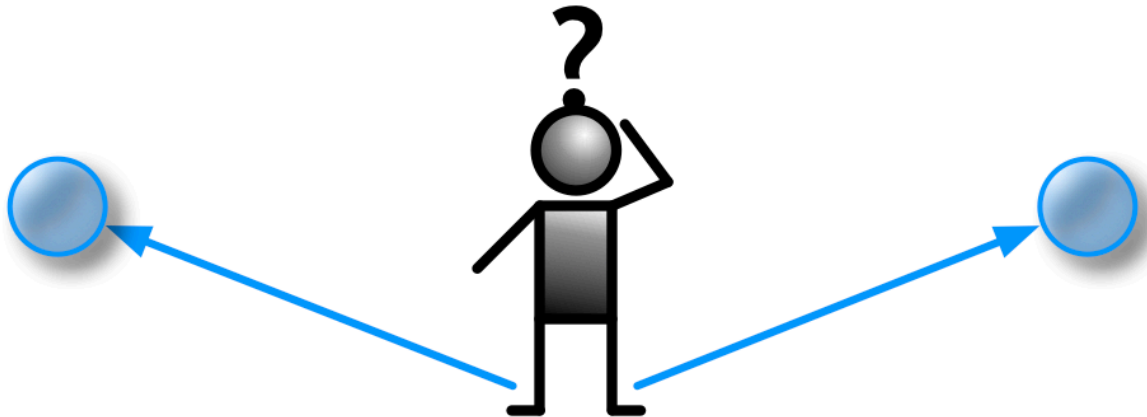
Spatio-temporal association rules

Whether a geographic object satisfies a rule, involving spatial, temporal and/or other attributes, identified within a related collection of geographic objects.



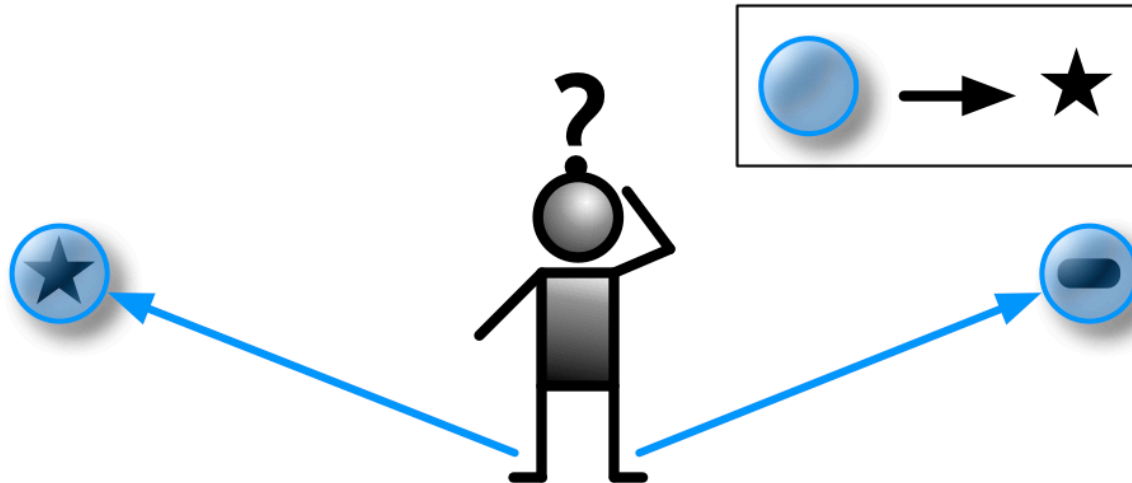
Spatio-temporal association rules

Whether a geographic object satisfies a rule, involving spatial, temporal and/or other attributes, identified within a related collection of geographic objects.



Spatio-temporal association rules

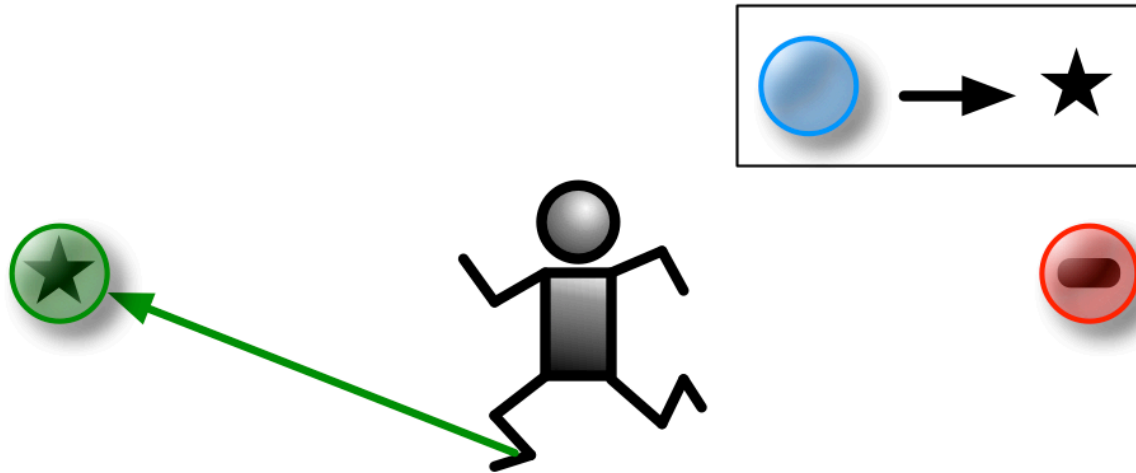
Whether a geographic object satisfies a rule, involving spatial, temporal and/or other attributes, identified within a related collection of geographic objects.





Spatio-temporal association rules

Whether a geographic object satisfies a rule, involving spatial, temporal and/or other attributes, identified within a related collection of geographic objects.





Criteria of Geographic Relevance: 24 + 4

| Properties | Geography | Information | Presentation |
|-----------------|---------------------------|---------------|----------------------|
| topicality | spatial proximity | specificity | accessibility |
| appropriateness | temporal proximity | availability | clarity |
| coverage | spatio-temporal proximity | accuracy | tangibility |
| novelty | directionality | currency | dynamism |
| | visibility | reliability | presentation quality |
| | hierarchies | verification | |
| | clusters | affectiveness | |
| | co-locations | curiosity | |
| | association rules | familiarity | |
| | | variety | |



Criteria of Geographic Relevance: 24 + 4

| Properties | Geography | Information | Presentation |
|-----------------|---------------------------|---------------|----------------------|
| topicality | spatial proximity | specificity | accessibility |
| appropriateness | temporal proximity | availability | clarity |
| coverage | spatio-temporal proximity | accuracy | tangibility |
| novelty | directionality | currency | dynamism |
| | visibility | reliability | presentation quality |
| | hierarchies | verification | |
| | clusters | affectiveness | |
| | co-locations | curiosity | |
| | association rules | familiarity | |
| | | variety | |

Next step: Given this set of possible criteria
an evaluation of the importance of the criteria is needed...



Thank you – any questions ?

Contacts

Stefano De Sabbata – stefano.desabbata@geo.uzh.ch

GeoRel Website - <http://georel.geo.uzh.ch/>