

Beloved, Brother, Friend: Comparing Dumuzi Myths using Shallow Ontologies

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Dumuzi is presented in different ways in Near Eastern myths. He is described as wild bull or man, sometimes he is part of a dedicated family structure or a separated entity. This poster presents eight different views on the Mesopotamian deity, modelled as minimal (or shallow) ontologies, used to compare Dumuzi’s diverse representations.

The project was undertaken as part of the DFG Mythos-Research Group 2064 STRATA at the University of Göttingen. It is a combined effort from graduate students of the field of computer science and Ancient Near Eastern Studies.

Focus of this project is the modelling of domain knowledge – the information that a written source gives us about the world it comes from, the belief systems, the characters of the narrative and their relations. This knowledge helps us to interpret the narratives surrounding Dumuzi.

Large public data repositories and ontologies like Wikidata combine information about entities. They are a valuable resource for re-using knowledge that was gathered from different sources.¹ However, for comparing myth-intrinsic information that is often contradictory, such large sources can be impractical.

For instance, “Dumuzi is a shepherd.” is a statement that appears in some narratives, but not in others. If it appears, we can assume the axiom *shepherd(Dumuzi)* to be *true* with respect to that specific source. However, if another source does not contain the information, we cannot assume that the axiom is *true* or *false*. Especially contradictory information, e.g. whether or not an entity is a deity in one narrative and a mortal human being in another, is important information for comparing myth variants. Therefore, instead of combining information into a single ontology, this project focuses on constructing small ontologies for each myth variant and comparing them in a separate step.

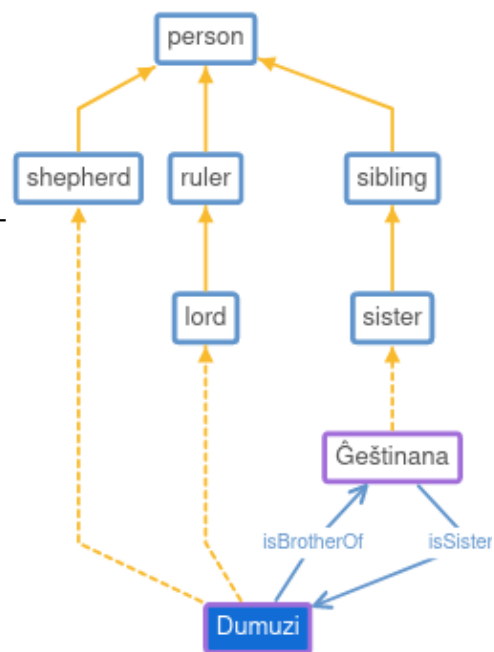


Figure 1: Example visualisation of the domain knowledge in “Dumuzi-Durtur-Eršema”

Table 1: Textual Sources of the myth variants and their corresponding references

Text	Reference
Death of Dumuzi	Kramer (1980)
Song of Innana and Dumuzi (J)	ETCSL Nr. 4.08.10
Innana-Dumuzi Lament (CUNES 53-08-060)	Cohen (2014)
Dumuzi and Geštinanna	ETCSL Nr. 1.4.1.1
Dumuzi Lament (ASJ 7, 1–9)	Alster (1985b)
Innana-Dumuzi-Eršema (BM 15821)	Cohen (1981), Ershemma No. 165
Innana-Dumuzi-Balaĝ (BE 30/1, 7)	Fritz (2003), 131-132
Dumuzi-Durtur-Eršema (CT 15, pl. 20-21)	Cohen (1981), Ershemma No. 88

1 See for example, Metilli (2019)

To compare different world views on Dumuzi, eight mythical variants in which Dumuzi and his death (listed in Table 1) are the main topic were selected. The domain knowledge we can assert from these myth variants is extracted according to the Hylistic (Zgoll, 2019) theory. Subsequently, it is modelled in shallow domain ontologies.

Important concepts and their shallow hierarchies (e.g. lord isA ruler isA person) are modelled as ontology classes. Characters, like *Dumuzi* or *Innana*, are modelled as individuals of the respective ontology. Character attributes and aliases are modelled as data properties, as shown in Figure 2. Relationships between entities of classes, like *isBrotherOf()* are modelled as object properties. Ontology labels are available in English and German. The individuals are linked to open data sources, Wikidata ID and Pleiades ID (for geolocations). A visualisation of a small example ontology is given in Figure 1.

The resulting ontologies are freely available as ttl-files and can be used for inter-myth and intra-myth comparison – i.e. comparing *variants* of the same myth or comparison of different myths. In this project, two measures are applied for overall domain comparison: The class overlap can provide an answer to the question “Which kinds of entities appear in the myth variant?” The individual overlap determines which characters are part of the stories, e.g. “Is this story only about Dumuzi or does Innana appear as well?” Individuals are matched by their labels, aliases or Wikidata ID. We define class overlap as

$$CO = \frac{|C_1 \cap C_2|}{|C_1 \cup C_2|}, \text{ where } C_1 \text{ and } C_2 \text{ are classes of ontology } O_1 \text{ and } O_2 \text{ respectively. Individual overlap is}$$

measured accordingly.

The results of these two comparisons are presented in distances matrices below. We observe the highest class overlap between the variants in “Innana-Dumuzi-Eršema (BM 15821)” and “Innana-Dumuzi Lament (CUNES 53-08-060)” with a value of 0.55. For individual overlap, i.e. the number of entities appearing in both sequences, the pair “Dumuzi-Durtur-Eršema (CT 15, pl. 20-21)” and “Innana-Dumuzi-Balaĝ (BE 30/1, 7)” have the highest value of 0.5.

This kind of inter-myth comparison gives scholars the opportunity to unravel similarities and contradictions between written sources based on a quantitative method, while at the same time it invites for a close reading of already known texts from a new perspective and supports further investigations, e.g. to compare different characters which are present in myths variants based on their ontological classes and relations. Within this project, the method was applied only to a small selection of texts, but it is suitable to analyze a broad range of texts in general. This yet has to be left for further studies.

Relationships		
alias	Alla	lang
alias	Ama-ušumgal-ana	lang
alias	Damu	lang
alias	Ištaran	lang
alias	Mulu-ser-ana	lang
alias	Umunsapar	lang
alias	Umunsude	lang
attribute	known	en
attribute	young	en
gender	male	en
attribute	bekannt	de
attribute	jung	de
gender	männlich	de
isBrotherOf	Geštinana	
WikidataID	Q549619	lang
Enter property	Enter value	lang

Figure 2: Dumuzi individual object and data properties in myth “Dumuzi-Durtur-Eršema”

References

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Domain Ontologies

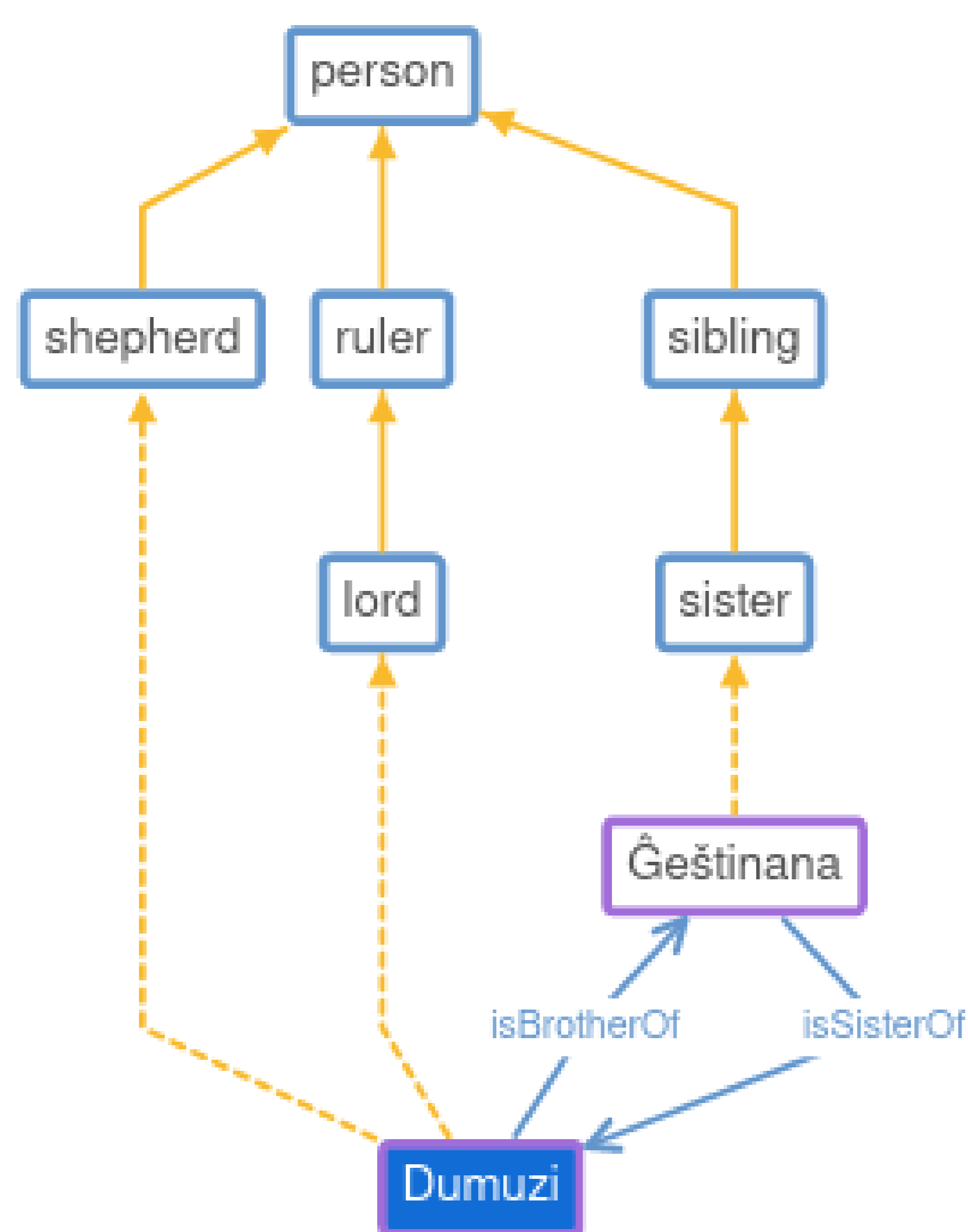


Figure: Dumuzi-Durtur-Eršema

This project focuses on the modelling of domain information based on written sources on the Mesopotamian deity *Dumuzi* in a re-usable, machine-readable way. For that purpose, eight myth variants in which *Dumuzi* is the main character were selected. These *myth variants* were analyzed according to the domain knowledge presented in them, e.g. *Dumuzi is a shepherd*.

Assertions like this form the basis for creating eight individual domain ontologies. They allow us to study differences between characters, between myth variants, and different myths. With a simple comparison formula we can measure ontology overlap, i.e. how similar the domains are, and investigate differences in the representation of characters, their attributes and relations to other characters.

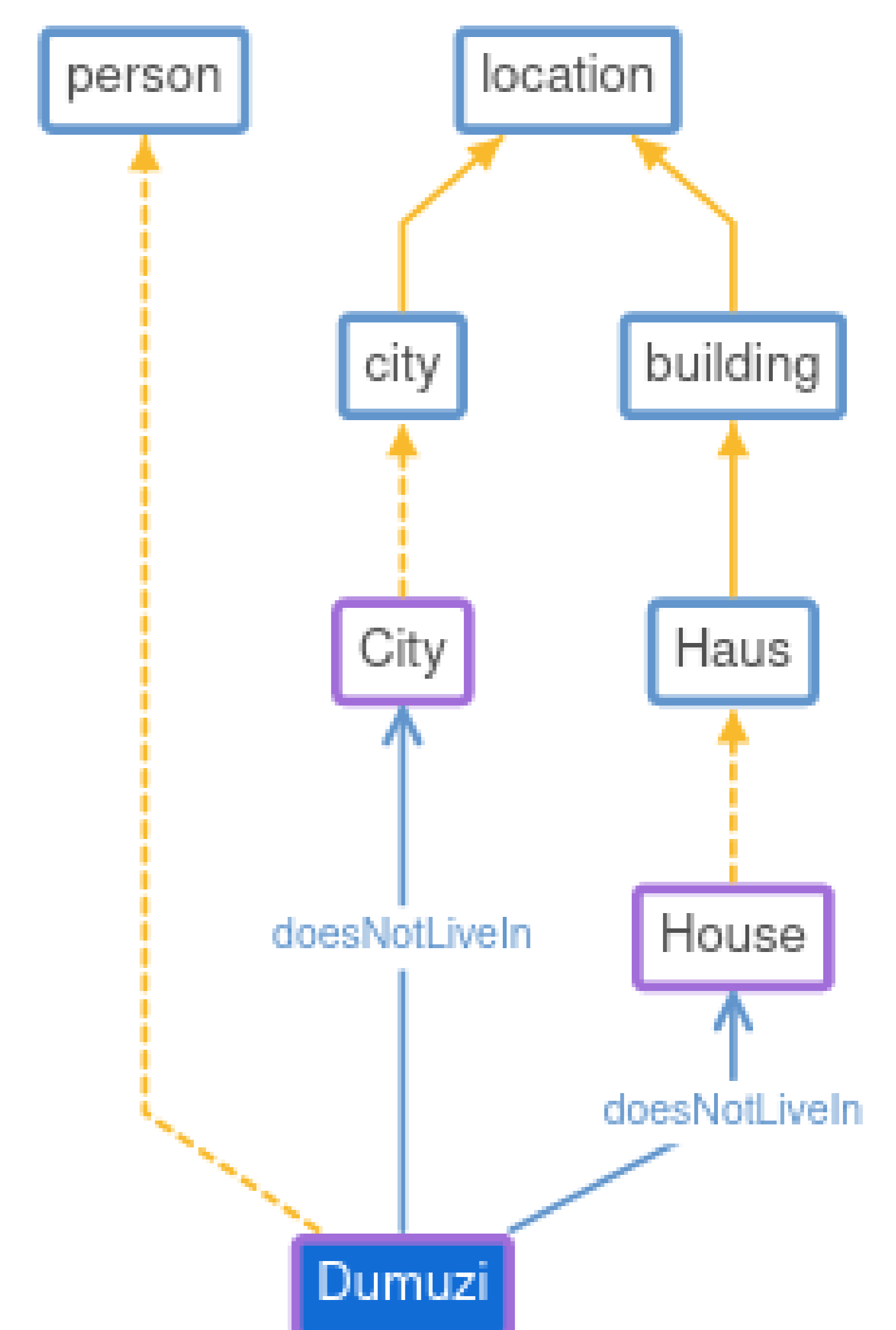


Figure: Dumuzi Lament

Domain Comparison



Data

8 Myths

- ▶ Dumuzi and Geštinanna (ETCSL 1.4.1.1)
- ▶ Death of Dumuzi (AnSt. 30, 5-13)
- ▶ Inanna-Dumuzi-Balaĝ (BE 30/1, 7)
- ▶ Dumuzi Lament (ASJ 7, 1–9)
- ▶ Innana-Dumuzi-Eršema (BM 15821)
- ▶ Song of Innana and Dumuzi (J) (ETCSL 4.08.10)
- ▶ Innana-Dumuzi Lament (CUNES 53-08-060)
- ▶ Dumuzi-Durtur-Eršema (CT 15, pl. 20-21)

Domain Comparison

- ▶ Compare ontologies with two measures: Class Overlap and Individual Overlap
- ▶ $IO = \frac{|I_1 \cap I_2|}{|I_1 \cup I_2|}$
- ▶ Class Overlap: Closest match *Innana-Dumuzi-Eršema* and *Innana-Dumuzi Lament* (0.55)
- ▶ Individual Overlap: *Dumuzi-Durtur-Eršema* and *Inanna-Dumuzi-Balaĝ* (0.5)

The ontologies are available for download in TTL format: <https://gitlab.gwdg.de/franziska.pannach/hylva/>