# Abstract

In this paper we will summarize three current, 2010+, research papers on how ontologies can be used to navigate and combine social networks to facilitate decisions on which meaning or instance of a concept a user wants to see. A common problem amongst this domain is linking concepts between ontologies if those ontologies use different semantics for the same concept or the same semantics for different concepts, techniques are evolving to solve this problem. We will also cover a summary of various ontology description languages and how they interact in semantic web for various uses. These techniques and ontology languages can be used when querying social networks to find relations to narrow the search down to those that are relevant to the current user.

# Introduction

The semantic web is a means of using the world wide web to create a method of sharing data between computers so that a machine can query and infer knowledge from existing information. In this paper we will cover three existing sources of information on the semantic web. Currently the web is not organized in a manner in which information can be processed easily by a machine, instead it is structured to be utilized by humans who can parse and extract information that is presented in an unorganized manner. Semantic web provides a means of organization that structures information in a simple format that can easily be parsed and utilized by a machine to handle user queries, and create inferences based on formal logic systems.

Section one will cover the data format of the semantic web and why It is structured the way it is in comparison to well-known formats. This will cover the Resource Description Framework (RDF), the Resource Description Framework schema (RDFs), and the Web Ontology Language (OWL) and how they relate to well-known data formats like EXtensible Markup Language (XML), Unified Modeling Language (UML), and Entity Relation Modeling (ER Modeling) of databases. This background and conceptual overview will provide a basis for understanding the underlying concepts of the semantic web so that their application can be appreciated.

Section two covers the notions of the issues of independent actors all trying to author and use the semantic web at once with no over-arching governing body. This will go over the problem of multiple resources having the same identifier, called semantic ambiguity. We will also cover the issue of multiple authors all authoring the same resource which means query processor has to find the correct one which is semantic redundancy. Their findings indicate that you can at better than chance rate determine the correct resource to use when performing a search using an ambiguous term and relate that term across different ontologies.

Section three will review a paper that applies some of these concepts in the realm of social media and connecting users across social networks. This paper addresses the issue of social networks not being able to interconnect amongst the web of all social networks. This is due to the ever changing landscape of social media content and the lack of a framework that successfully integrates the different ontologies to relate all the users and content. They presented an overview of existing ontologies, such as friend of a friend (FOAF), semantically interlinked online communities (SIOC), simple knowledge organization system (SKOS), and Dublin Core (DC) and how these ontologies can be used together to build a framework and address the issue of creating a more interconnected web. A brief discussion of how this framework will help describe user generated content on social networks and how it relates to users.

Once the semantic web grows and matures users will be able to be linked and identified across social networks based on the ontologies presented by each social network. This will allow the interconnection of users across social networks and allow for a better understanding of how people communicate and relate using social networks.

# Conclusion

Based on the resources analyzed we have seen that the semantic web is still growing and evolving and eventually will allow for an interconnected web of social networks. The research we reviewed, did not provide an implementation but did describe how these technologies, methods, and concepts can be applied together to create a more connected and machine friendly web. The reach of semantic web goes far beyond social networks and we only scratched the surface of one area of its application and usefulness.

# Future Work

A common framework RDFs and OWL that can be used to generalize and relate social networks to each other so that users can be identified across networks.

A means of linking users across social networks and then consolidating their content so that the user and their content as a whole can be queried.

A means of detecting a user being a member of multiple social networking sites and linking those two accounts to one resource by filtering out users that share similar attributes and identifying characteristics.

# References

1. Gracia, J.; Mena, E., "Dealing with Semantic Heterogeneity Issues on the Web," in Internet Computing, IEEE , vol.PP, no.99, pp.1-1, 0

doi: 10.1109/MIC.2011.129

URL: <http://ieeexplore.ieee.org.huaryu.kl.oakland.edu/stamp/stamp.jsp?tp=&arnumber=6025341&isnumber=5226613>

1. Jamalzadeh, M.; Behravan, N., "Using Semantic Web Ontologies for better inter-operability on social network sites," in Control System, Computing and Engineering (ICCSCE), 2011 IEEE International Conference on , vol., no., pp.103-108, 25-27 Nov. 2011

doi: 10.1109/ICCSCE.2011.6190504

URL: <http://ieeexplore.ieee.org.huaryu.kl.oakland.edu/stamp/stamp.jsp?tp=&arnumber=6190504&isnumber=6190479>

1. Mika, P. (2007). Social networks and the semantic web. New York, NY: Springer.

URL: <http://www.springer.com/us/book/9780387710006>