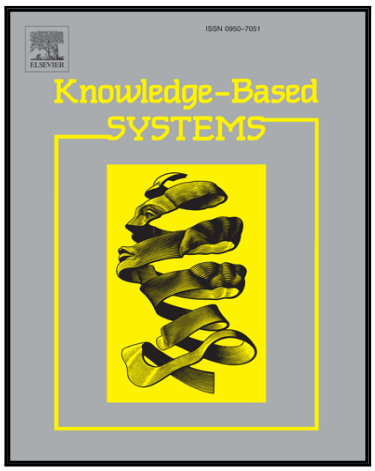
Accepted Manuscript



A Practical Approach to Modelling and Validating Integrity Constraints in the Semantic Web

Yanfeng Shu

PII: S0950-7051(18)30186-2
DOI: 10.1016/j.knosys.2018.04.021
Reference: KNOSYS 4303

To appear in: *Knowledge-Based Systems*

Received date: 12 October 2017
Revised date: 14 April 2018
Accepted date: 16 April 2018

Please cite this article as: Yanfeng Shu, A Practical Approach to Modelling and Validating Integrity Constraints in the Semantic Web, *Knowledge-Based Systems* (2018), doi: 10.1016/j.knosys.2018.04.021

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

A Practical Approach to Modelling and Validating Integrity Constraints in the Semantic Web

Yanfeng Shu*

CSIRO, Private Bag 12, Hobart, TAS 7001, Australia

Abstract

Efforts have been made in the Semantic Web to combine rules with ontologies. One result of these efforts is the development of the Semantic Web Rule Language (SWRL) which is designed to integrate closely with the Web Ontology Language (OWL). Both SWRL and OWL adhere to the open-world semantics of first-order logic, and thus are not suitable for modelling integrity constraints in applications where complete knowledge about some parts of the domain can be assumed. In this paper, we investigate this problem and present a practical approach to modelling and validating constraints in the Semantic Web. Building on existing work, we show that by employing a constraint semantics for both OWL and SWRL, we can model common constraints as OWL axioms or SWRL rules. We also show that by using a query reduction technique, we can validate constraints using existing OWL/SWRL reasoners. Finally, we demonstrate the usefulness of our approach via a real-world case study.

Keywords:
Semantic Web, Data validation, Integrity constraint, OWL, SWRL

1. Introduction

The Semantic Web is an extension of the current Web, in which information is given well-defined meaning, better enabling computers and people to work

*Corresponding author
Email address: Yanfeng.Shu@csiro.au (Yanfeng Shu)

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/6861345

Download Persian Version:

https://daneshyari.com/article/6861345

Daneshyari.com