



## 基于Linked Data的RDF关联框架综析

陶俊<sup>1,2</sup>, 孙坦<sup>1</sup>

1. 中国科学院国家科学图书馆 北京 100190;
2. 中国科学院研究生院 北京 100049

Tao Jun<sup>1,2</sup>, Sun Tan<sup>1</sup>

1. National Science Library, Chinese Academy of Sciences, Beijing 100190, China;
2. Graduate University of Chinese Academy of Sciences, Beijing 100049, China

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**摘要** 关联数据研究由关联发布逐渐走向集成应用,为此需要解决RDF链接的关联问题。分析支持向量机方法、后向关联方法、模式映射方法和R2R属性转换方法等RDF关联原理,在此基础上从系统框架、支撑语言和关键算法的视角分析Silk、LIMES和R2R三种关联框架。最后从算法、框架和应用的角度分析RDF关联研究的未来发展动向。

**关键词:** [关联数据](#) [关联算法](#) [关联框架](#) [发展趋势](#) [语义网](#)

**Abstract:** RDF linkage should be solved with the development of linked data from publishing toward gradually integration application. This paper analyses approaches for RDF linkage algorithm such as support vector machine, backlink based on HTTP referer, schema mapping and R2R property transformation. In addition, linkage frameworks such as Silk, LIMES and R2R are explored from the angle of system framework, language and key algorithm. Finally, future development of RDF linkage are discussed in the perspective of linkage algorithm, framework and application.

**Keywords:** [Linked data](#), [Linkage algorithm](#), [Linkage framework](#), [Development trend](#), [Semantic Web](#)

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- [1] Bizer C, Heath T, Berners-Lee T. Linked Data-The Story so Far[J]. *International Journal of Semantic Information System*, 2009, 5(3): 1-22.
- [2] 刘炜. 关联数据: 概念、技术及应用展望[J]. *大学图书馆学报*, 2011, 29(2): 5-12.
- [3] LinkingOpenData[EB/OL]. [2011-09-29]. <http://www.w3.org/wiki/SweolG/TaskForces/CommunityProjects/LinkingOpenData>.
- [4] Elmagarmid A K, Lpeiritos P G, Verykios V S. Duplicate Record Detection: A Survey[J]. *IEEE Transactions on Knowledge and Data Engineering*, 2007, 19(1): 1-16.
- [5] Euzenat J, Shvaiko P. *Ontology Matching*[M]. Berlin: Springer, 2007.
- [6] Witten I H, Frank E. *数据挖掘: 实用机器学习技术*[M]. 董琳, 邱泉, 于晓峰, 等译. 北京: 机械工业出版社, 2007.
- [7] 白海燕. 关联数据及DBpedia实例分析[J]. *现代图书情报技术*, 2010(3): 33-39.
- [8] Volz J, Bizer C, Gaedke M, et al. Silk-A Link Discovery Framework for the Web of Data[C/OL]. In: *Proceedings of LDOW 2009*, Madrid, Spain. [2011-09-29]. <http://www4.wiwiw.fu-berlin.de/bizer/silk>.
- [9] LIMES-Link Discovery Framework for Metric Spaces[EB/OL]. [2011-11-22]. <http://aksw.org/Projects/limes>.
- [10] Nikolov A. Fusing Automatically Extracted Annotations for the Semantic Web[R/OL]. [2011-10-20]. <http://people.kmi.open.ac.uk/andriy/nikolov-thesis-submitted.pdf>.
- [11] Levenshtein V I. Binary Codes Capable of Correcting Deletions, Insertions and Reversals[J]. *Doklady Akademii Nauk SSSR*, 1965, 163(4): 845-

- [12] Raimond Y, Sutton C, Sandler M. Automatic Interlinking of Music Datasets on the Semantic Web[C/OL]. In: *Proceedings of LDOW2008*. [2011-11-22]. <http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-369/paper18.pdf>.
- [13] 邓兰兰, 李春旺. Web数据关联创建策略研究[J]. 现代图书情报技术, 2011(5): 1-6.
- [14] Alpaydin E. 机器学习导论[M]. 范明, 牛常勇译. 北京: 机械工业出版社, 2009.
- [15] Mayfield J, Alexander D, Dorr B, et al. Cross-document Coreference Resolution: A Key Technology for Learning by Reading[C/OL]. In: *Proceedings of AAAI Spring Symposium on Learning by Reading and Learning to Read. 2009*. [2011-11-22]. <http://terpconnect.umd.edu/~oard/pdf/sss09.pdf>.
- [16] Sleeman J, Finin T. A Machine Learning Approach to Linking FOAF Instances[C/OL]. In: *Proceedings of Association for the Advancement of Artificial Intelligence, 2010*. [2011-11-22]. <http://ebiquity.umbc.edu/paper/html/id/471>.
- [17] Nikolov A, Motta E. Capturing Emerging Relations Between Schema Ontologies on the Web of Data[C/OL]. In: *Proceedings of the 1st International Workshop on Consuming Linked Data, ISWC 2010, Shanghai, China, 2010*. [2011-11-22]. [http://ceur-ws.org/Vol-665/NikolovEtAl\\_COLD2010.pdf](http://ceur-ws.org/Vol-665/NikolovEtAl_COLD2010.pdf).
- [18] Muhleisen H, Jentzsch A. Augmenting the Web of Data Using Referers[C/OL]. In: *Proceedings of LDOW2011*. [2011-11-22]. <http://ceur-ws.org/Vol-813/ldow2011-paper03.pdf>.
- [19] Nikolov A, Uren V, Motta E, et al. Integration of Semantically Annotated Data by the KnoFuss Architecture[C/OL]. In: *Proceedings of the 16th International Conference on Knowledge Engineering and Knowledge Management, 2008*: 265-27. [2011-11-22]. <http://kmi.open.ac.uk/people/andriy/ekaw2008.pdf?>
- [20] Bizer C, Schultz A. The R2R Framework: Publishing and Discovering Mappings on the Web[C/OL]. In: *Proceedings of the 1st International Workshop on Consuming Linked Data, Shanghai, China, 2010*. [2011-11-22]. [http://ceur-ws.org/Vol-665/BizerEtAl\\_COLD2010.pdf](http://ceur-ws.org/Vol-665/BizerEtAl_COLD2010.pdf).
- [21] SimMetrics from The University of Sheffield[EB/OL]. [2011-11-22]. <http://www.aktors.org/technologies/simmetrics/index.html>.
- [22] Weka 3: Data Mining Software in Java [EB/OL]. [2011-11-22]. <http://www.cs.waikato.ac.nz/ml/weka/>.
- [23] LIBSVM -- A Library for Support Vector Machines[EB/OL]. [2011-11-22]. <http://www.csie.ntu.edu.tw/~cjlin/libsvm/>.
- [24] SVM-Light Support Vector Machine[EB/OL]. [2011-11-22]. <http://www.svmlight.joachims.org>.
- [25] Isele R, Jentzsch A, Bizer C. Silk Server-Adding Missing Links While Consuming Linked Data[C/OL]. In: *Proceedings of the 1st International Workshop on Consuming Linked Data, Shanghai, China, 2010*. [2011-11-22]. [http://ceur-ws.org/Vol-665/IseleEtAl\\_COLD2010.pdf](http://ceur-ws.org/Vol-665/IseleEtAl_COLD2010.pdf). 
- [26] Hassanzadeh O, Xin R, Miller R J, et al. Linkage Query Writer[C/OL]. In: *Proceedings of the 35th International Conferences on Very Large Data Bases, 2009*. [2011-11-22]. <http://dl.acm.org/citation.cfm?id=1687599>.
- [27] LIMES: Link Discovery Framework for Metric Spaces[EB/OL]. [2011-11-22]. <http://aksw.org/Projects/limes>.
- [28] Ngomo A N, Auer S. LIMES-A Time-Efficient Approach for Large-Scale Link Discovery on the Web of Data[C/OL]. In: *Proceedings of LDOW2011*. [2011-11-22]. [http://svn.aksw.org/papers/2011/WWW\\_LIMES/public.pdf](http://svn.aksw.org/papers/2011/WWW_LIMES/public.pdf).
- [29] The R2R Framework - Transforming RDF Datasets, User Manual and Mapping Language Specification[EB/OL]. [2011-11-22]. <http://www4.wiwiw.fu-berlin.de/bizer/r2r/spec/>.
- [30] 白海燕, 朱礼军. 关联数据的自动关联构建研究[J]. 现代图书情报技术, 2010(2): 44-49.
- [31] Narasimha V, Kappara V P, Ichise P, et al. LiDDM: A Data Mining System for Linked Data[C/OL]. In: *Proceedings of LDOW2011*. [2011-11-22]. <http://ceur-ws.org/Vol-813/ldow2011-paper07.pdf>.
- [32] Rusu D, Fortuna B, Mladenec D. Automatically Annotating Text with Linked Open Data[C/OL]. In: *Proceedings of LDOW2011*. [2011-11-22]. <http://ceur-ws.org/Vol-813/ldow2011-paper09.pdf>.
- [33] Building a Super Database from Linked Data[EB/OL]. [2011-11-22]. <http://www.slideshare.net/swang75/ss-7098611>.
- [34] RDFgrid[EB/OL]. [2011-11-22]. <https://github.com/datagraph/rdfgrid>.
- [35] Hausenblas M. Linked Data Applications-DERI Technical Report, 2009[R/OL]. [2011-11-22]. <http://linkeddata.deri.ie/tr/2009-ld2webapp>.
- [36] Sequeda J F. Consuming Linked Data[EB/OL]. [2011-11-22]. <http://www.slideshare.net/juansequeda/consuming-linked-data-semtech2010>.
- [37] 沈志宏, 张晓林. 关联数据及其应用现状综述[J]. 现代图书情报技术, 2010(11): 1-9.
- [38] 黄永文, 岳笑, 刘建华. 关联数据应用的体系框架及构建关联数据应用的建议[J]. 现代图书情报技术, 2011(9): 7-13.
- [39] Becker C, Bizer C. DBpedia Mobile: A Location Enabled Linked Data Browser[C/OL]. In: *Proceedings of LDOW2008*. [2011-11-22]. <http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-369/paper13.pdf>.
- [40] Becker C, Bizer C, Erdmann M, et al. Extending SMW+ with a Linked Data Integration Framework[C]. In: *Proceedings of ISWC 2010, Shanghai, China, 2010*.
- [41] SMW+—A Semantic Enterprise Wiki[EB/OL]. [2011-11-22]. <http://wiki.ontoprise.de>.
- [42] 刘媛媛, 李春旺. 基于LOD的关联参考服务构建研究[J]. 现代图书情报技术, 2011(6): 66-71.
- [43] Hey T, TanSley S, Tolle K. The Fourth Paradigm: Data-Intensive Scientific Discovery[OL]. [2011-11-22]. [http://research.microsoft.com/en-us/collaboration/fourthparadigm/4th\\_paradigm\\_book\\_complete\\_lr.pdf](http://research.microsoft.com/en-us/collaboration/fourthparadigm/4th_paradigm_book_complete_lr.pdf).

[44] JISC Data Services & Collections[EB/OL].[2011-11-22]. <http://www.jisc.ac.uk/whatwedo/topics/dataservices.aspx>.

[45] 李晓辉. 图书馆科研数据管理与服务模式探讨[J]. 中国图书馆学报, 2011,37(5): 46-52.

[46] 张晓林. 颠覆数字图书馆的大趋势[J]. 中国图书馆学报, 2011,37(5): 4-12.

- [1] 黄永文, 岳笑, 刘建华. 关联数据应用的体系框架及构建关联数据应用的建议[J]. 现代图书情报技术, 2011,27(9): 7-13
- [2] 白海燕, 梁冰. 利用D2R实现关系数据库与关联数据的语义模式映射[J]. 现代图书情报技术, 2011,27(7/8): 1-7
- [3] 刘媛媛, 李春旺, 黄永文. 基于LOD的关联参考服务构建研究[J]. 现代图书情报技术, 2011,27(6): 66-71
- [4] 邓兰兰, 李春旺. Web数据关联创建策略研究[J]. 现代图书情报技术, 2011,27(5): 1-6
- [5] 沈志宏, 张晓林. 语义网环境下数据溯源表达模型研究综述[J]. 现代图书情报技术, 2011,27(4): 1-8
- [6] 朝乐门, 张勇, 邢春晓. DBpedia及其典型应用[J]. 现代图书情报技术, 2011,27(3): 80-87
- [7] 李亚子, 钱庆, 刘峥, 方安, 洪娜, 王军辉. 基于UMLS的疾病知识整合框架研究[J]. 现代图书情报技术, 2011,27(2): 34-41
- [8] 王思丽, 祝忠明. 利用关联数据实现机构知识库的语义扩展研究[J]. 现代图书情报技术, 2011,(11): 17-23
- [9] 李俊. 语义数据库Freebase研究[J]. 现代图书情报技术, 2011,27(10): 18-23
- [10] 白海燕, 乔晓东. 基于本体和关联数据的书目组织语义化研究[J]. 现代图书情报技术, 2010,26(9): 18-27
- [11] 安璐, 李纲. 国外图书情报类期刊热点主题及发展趋势研究[J]. 现代图书情报技术, 2010,26(9): 48-55
- [12] 黄永文. 关联数据在图书馆中的应用研究综述\*[J]. 现代图书情报技术, 2010,26(5): 1-7
- [13] 白海燕. 关联数据及DBpedia实例分析\*[J]. 现代图书情报技术, 2010,26(3): 33-39
- [14] 白海燕, 朱礼军. 关联数据的自动关联构建研究\*[J]. 现代图书情报技术, 2010,26(2): 44-49
- [15] 刘毅, 宋文, 汤怡洁, 杨锐, 黄金霞, 周子健. 基于Vitro构建专业领域知识应用环境[J]. 现代图书情报技术, 2010,26(12): 21-27