知识图谱 （Knowledge Graph）

1 入门学习

1. 大规模知识图谱技术 王昊奋 华东理工大学 [https://wenku.baidu.com/view/3d891bdcf524ccbff021840e.html?sxts=1544106674435]
2. 知识图谱技术原理介绍 王昊奋 [https://wenku.baidu.com/view/de36df590640be1e650e52ea551810a6f524c8c2.html?from=search]
3. 大规模知识图谱的表示学习及其应用 刘知远 [https://qngw2014.bj.bcebos.com/upload/kg3/KG%202015%20-%20%E5%A4%A7%E8%A7%84%E6%A8%A1%E7%9F%A5%E8%AF%86%E5%9B%BE%E8%B0%B1%E8%A1%A8%E7%A4%BA%E5%AD%A6%E4%B9%A0%E7%9A%84%E8%B6%8B%E5%8A%BF%E4%B8%8E%E6%8C%91%E6%88%98.pdf]
4. 知识图谱的知识表现方法回顾与展望 鲍捷 [https://qngw2014.bj.bcebos.com/upload/kg3/KG%202015%20-%20%E7%9F%A5%E8%AF%86%E5%9B%BE%E8%B0%B1%E7%9A%84%E7%9F%A5%E8%AF%86%E8%A1%A8%E7%8E%B0%E6%96%B9%E6%B3%95%E5%9B%9E%E9%A1%BE%E4%B8%8E%E5%B1%95%E6%9C%9B.pdf]
5. 基于翻译模型(Trans系列)的知识表示学习 [http://www.sohu.com/a/116866488_465975]
6. TransE算法（Translating Embedding）

[http://blog.csdn.net/u011274209/article/details/50991385]

7. OpenKE 刘知远 清华大学 知识表示学习（Knowledge Embedding）旨在将知识图谱中实体与关系嵌入到低维向量空间中，有效提升知识计算效率。 [http://openke.thunlp.org/]
8. 面向大规模知识图谱的表示学习技术 刘知远 [http://www.cbdio.com/BigData/2016-03/03/content_4675344.htm]
9. 当知识图谱“遇见”深度学习 肖仰华 [http://caai.cn/index.php?s=/Home/Article/qikandetail/year/2017/month/04.html]
10. NLP与知识图谱的对接 白硕 [http://caai.cn/index.php?s=/Home/Article/qikandetail/year/2017/month/04.html]

2 进阶论文

1. sowa J F. Principles of semantic networks: Exploration in the representation of Knowledge[J]. Frame Problem in Artificial Intelligence, 1991(2-3):135–157. [https://www.researchgate.net/publication/230854809_Principles_of_Semantic_Networks_Exploration_in_the_Representation_of_Knowledge]
2. Brachman R J, Borgida A, Mcguinness D L, et al. " Reducing" CLASSIC to Practice: Knowledge representation theory Meets reality[c]// conceptual Modeling: Foundations and applications. springerVerlag. 2009:436-465. [http://www.sciencedirect.com/science/article/pii/S0004370299000788]
3. Berners-Lee T, Hendler J, Lassila O. The semantic Web: A new Form of Web content that is Meaningful to computers will Unleash a revolution of New Possibilities[J]. Scientific American, 2001, 284(5):34-43. [http://xitizap.com/semantic-web.pdf]
4. Guodong Z, Jian S, Jie Z, et al. Exploring Various Knowledge in relation Extraction.[c]// ACL 2005, Meeting of the Association for Computational Linguistics, Proceedings of the Conference, 2530 June, 2005, University of Michigan, USA. DBLP. 2005:419-444. [https://dl.acm.org/citation.cfm?id=1219893]
5. Hashimoto K, Stenetorp P, Miwa M, et al. Taskoriented learning of Word Embeddings for semantic Relation Classification[J], Computer Science, 2015:268-278. [http://arxiv.org/abs/1503.00095]
6. Miwa M, Sasaki Y. Modeling Joint Entity and Relation Extraction with table R epresentation[C]// C onference on Empirical Methods in N atural Language

Processing. 2014:944-948. [http://www.anthology.aclweb.org/D/D14/D14-1200.pdf]

7. Li Q, Ji H. Incremental Joint Extraction of Entity Mentions and relations[c]// annual Meeting of the Association for Computational Linguistics. 2014:402-412. [http://www.anthology.aclweb.org/P/P14/P14-1038.pdf]
8. Kate R J, Mooney R J. Joint Entity and relation Extraction using card-pyramid Parsing[c]// C onference on C omputational N atural L anguage learning. 2010:203-212. [http://www.cse.fau.edu/~xqzhu/courses/cap6777/Joint.Named.Entity.kate.conll10.pdf]
9. Miwa M, Bansal M. End-to-End Relation Extraction using LSTMs on S equences and tree structures[c]// annual Meeting of the association for computational linguistics. 2016:1105-1116. [https://arxiv.org/abs/1601.00770]
10. brin s. Extracting Patterns and relations from the World Wide Web[J]. lecture notes in computer Science, 1998, 1590:172-183 [Extracting Patterns and relations from the World Wide Web]
11. Carlson A, Betteridge J, Kisiel B, et al. Toward an architecture for N ever-Ending language learning. [C]// twenty-Fourth AAAI C onference on A rtificial Intelligence, AAAI 2010, Atlanta, Georgia, Usa, July. DBLP, 2010:529-573. [https://www.aaai.org/ocs/index.php/AAAI/AAAI10/paper/view/1879]
12. Mitchell T, Fredkin E. Never-ending Language L earning[M]// N ever-Ending L anguage L earning. Alphascript Publishing, 2014. [http://www.ischool.drexel.edu/bigdata/bigdata2014/NELL_Mitchell_IEEE_Oct2014_distr.pdf]
13. Wang H, Fang Z, Zhang L, et al. Effective Online Knowledge Graph Fusion[M]// the semantic Web ISWC 2015. Springer International Publishing, 2015: 286-302. [http://iswc2015.semanticweb.org/sites/iswc2015.semanticweb.org/files/93660257.pdf]
14. Otero-Cerdeira L, Rodríguez-Martínez F J, Gómez-Rodríguez A. Ontology Matching: A Literature Review[J]. Expert Systems with Applications, 2015, 42(2):949–971. [http://disi.unitn.it/~p2p/RelatedWork/Matching/Cerdeira-Ontology%20Matching-2015.pdf]
15. Hu W, Chen J, Qu Y. A Self-training Approach for resolving object coreference

on the semantic Web[C]// I nternational C onference on World Wide Web. ACM, 2011:87-96. [https://dl.acm.org/citation.cfm?id=1963421]

16. Li J, Wang Z, Zhang X, et al. Large Scale instance Matching via Multiple indexes and candidate Selection[J]. Knowledge-Based Systems, 2013, 50(3):112-120. [http://disi.unitn.it/~p2p/RelatedWork/Matching/KBS13-Li-et-al-large-instance.pdf]
17. Han X, Sun L. A Generative Entity-Mention Model for linking Entities with Knowledge base[c]// T he Meeting of the A ssociation for C omputational Linguistics: Human Language Technologies, Proceedings of the Conference, 19-24 June, 2011, Portland, Oregon, USA. DBLP, 2011:945-954. [https://dl.acm.org/citation.cfm?id=2002592]
18. Zhang W, Sim Y C, Su J, et al. Entity Linking with Effective Acronym Expansion, Instance Selection and topic Modeling[c]// international Joint conference on Artificial Intelligence. 2011:1909-1914. [http://www.aaai.org/ocs/index.php/IJCAI/IJCAI11/paper/view/3392]
19. Shen W, Wang J, Luo P, et al. Linking Named Entities in tweets with Knowledge Base via User Interest Modeling[C]// AC M SI GKDD I nternational C onference on Knowledge Discovery and Data Mining. ACM, 2013:68-76. [https://dl.acm.org/citation.cfm?id=2487686]
20. Han X, Sun L, Zhao J. Collective Entity Linking in Web text: A Graph-based Method[c]// Proceeding of the international acM siGir conference on research and Development in Information Retrieval, SIGIR 2011, Beijing, China, July. DBLP, 2011:765-774. [https://dl.acm.org/citation.cfm?id=2010019]
21. Alhelbawy A, Gaizauskas R. Graph Ranking for collective named Entity Disambiguation[c]// Meeting of the Association for Computational L inguistics. 2014:75-80. [http://www.anthology.aclweb.org/P/P14/P14-2013.pdf]
22. He Z, Liu S, Li M, et al. Learning Entity representation for Entity Disambiguation[J]. annual Meeting of the A ssociation for C omputational Linguistics, 2013, (2):30-34. [http://www.doc88.com/p-9039715083540.html]
23. Huang H, Heck L, Ji H. Leveraging Deep neural networks and Knowledge Graphs for Entity Disambiguation[J]. Computer Science, 2015:1275-1284. [http://arxiv.org/abs/1504.07678]
24. Zhou Z, Qi G, Wu Z, et al. A Platform-Independent A pproach for Parallel Reasoning with OWLEL Ontologies Using Graph Representation[C]// IEEE, I

nternational C onference on TOOLS with A rtificial Intelligence. IEEE, 2015:80-87. [http://ieeexplore.ieee.org/xpls/icp.jsp?arnumber=7372121]

25. Nickel M, Murphy K, Tresp V, et al. A Review of relational Machine learning for Knowledge Graphs[J]. Proceedings of the IEEE, 2016, 104(1):11-33. [http://arxiv.org/abs/1503.00759]
26. Nickel M, Tresp V, Kriegel H P. A Three-Way Model for collective learning on Multi-relational Data. [C]// International Conference on Machine Learning, ICML 2011, Bellevue, Washington, Usa, June 28 July. DBLP, 2011:809-816. [http://www.icml-2011.org/papers/438_icmlpaper.pdf]
27. Bordes A, Weston J, Collobert R, et al. Learning structured Embeddings of Knowledge bases[c]// AAAI Conference on Artificial Intelligence, AAAI 2011, San Francisco, California, Usa, August. DBLP, 2011:301-306. [http://www.aaai.org/ocs/index.php/AAAI/AAAI11/paper/view/3659]
28. Nickel M, Rosasco L, Poggio T. Holographic Embeddings of Knowledge Graphs[J]// AAAI Conference on Artificial Intelligence. 2016:1955-1961. [http://arxiv.org/abs/1510.04935]
29. Galárraga L, Teflioudi C, Hose K, et al. Fast Rule Mining in ontological Knowledge bases with aMiE+[J]. The VLDB Journal, 2015, 24(6):707-730. [https://dl.acm.org/citation.cfm?id=2846643]
30. Lao N, Mitchell T, Cohen W W. Random Walk inference and learning in a large scale Knowledge base[c]// conference on Empirical Methods in natural Language Processing, EMNLP 2011, 27-31 July 2011, John Mcintyre Conference Centre, Edinburgh, Uk, A Meeting of Sigdat, A Special Interest Group of the ACL. DBLP, 2011:529-539. [https://dl.acm.org/citation.cfm?id=2145494]
31. Hellmann S, Lehmann J, Auer S. Learning of oWl class Descriptions on Very large Knowledge bases[J]. international Journal on semantic Web and Information Systems, 2009, 5(5):25-48. [http://wifo5-03.informatik.uni-mannheim.de/bizer/pub/iswc2008pd-bak/iswc2008pd_submission_83.pdf]
32. lehmann J. Dl-learner: learning concepts in Description logics[J]. Journal of Machine learning Research, 2009, 10(6):2639-2642. [http://dl.acm.org/citation.cfm?id=1755874]
33. Suchanek F M, Kasneci G, Weikum G. YAGO: A large ontology from Wikipedia and Wordnet[J]. Web semantics science services and agents on the World

Wide Web, 2008, 6(3):203-217. [http://www.sciencedirect.com/science/article/pii/S1570826808000437]

34. Vrande, Denny, Tzsch M. Wikidata: A Free collaborative Knowledge base[J]. communications of the ACM, 2014, 57(10):78-85. [https://cacm.acm.org/magazines/2014/10/178785-wikidata/fulltext]
35. Navigli R, Ponzetto S P. BabelNet: Building a very Large Multilingual S emantic Network[C]// annual Meeting of the association for computational linguistics. 2010:216-225. [https://dl.acm.org/citation.cfm?id=1858704]

3 Tutorial

1. 知识图谱导论 刘 康 韩先培 [http://cips-upload.bj.bcebos.com/ccks2017/upload/CCKS2017V5.pdf]
2. 知识图谱构建 邹 磊 徐波 [http://cips-upload.bj.bcebos.com/ccks2017/upload/zl.pdf]
3. 知识获取方法 劳 逆 邱锡鹏 [http://cips-upload.bj.bcebos.com/ccks2017/upload/2017-ccks-Knowledge-Acquisition-.pdf]
4. 知识图谱实践 王昊奋 胡芳槐 [http://www.ccks2017.com/?page_id=46]
5. 知识图谱学习小组学习
   • 第一期w1：知识提取 • 第一期w2：知识表示 • 第一期w3：知识存储 • 第一期w4：知识检索 [https://github.com/memect/kg-beijing]
6. 深度学习与知识图谱 刘知远 韩先培 CCL2016 [http://www.cips-cl.org/static/CCL2016/tutorialpdf/T2A_%E7%9F%A5%E8%AF%86%E5%9B%BE%E8%B0%B1_part3.pdf]

4 综述

1. 知识表示学习研究进展 刘知远 2016 [http://nlp.csai.tsinghua.edu.cn/~lyk/publications/knowledge_2016.pdf]
2. 知识图谱研究进展 漆桂林 2017 [[http://tie.istic.ac.cn/ch/reader/view_abstract.aspx?doi=10.3772/j.issn.2095-915x.2017.01.002]]
3. 知识图谱技术综述 徐增林 [http://www.xml-data.org/dzkj-nature/html/201645589.htm]
4. 基于表示学习的知识库问答研究进展与展望 刘康

[http://www.aas.net.cn/CN/10.16383/j.aas.2016.c150674]

5. Knowledge Graph Refinement: A Survey of Approaches and Evaluation Methods Heiko Paulheim [http://www.semantic-web-journal.net/system/files/swj1167.pdf]

5 视频教程

1. Google 知识图谱系列教程（1-21）[https://www.youtube.com/watch?v=mmQl6VGvX-c&list=PLOU2XLYxmsII2vIhzAyW6eouf62ur2Z2q]

6 代码

1. ComplEx @ https://github.com/ttrouill/complex
2. EbemKG @ https://github.com/pminervini/ebemkg
3. HolE @ https://github.com/mnick/holographic-embeddings
4. Inferbeddings @ https://github.com/uclmr/inferbeddings
5. KGE-LDA @ https://github.com/yao8839836/KGE-LDA
6. KR-EAR @ https://github.com/thunlp/KR-EAR
7. mFold @ https://github.com/v-shinc/mFoldEmbedding
8. ProjE @ https://github.com/bxshi/ProjE
9. RDF2Vec @ http://data.dws.informatik.uni-mannheim.de/rdf2vec/code/
10. Resource2Vec @ https://github.com/AKSW/Resource2Vec/tree/master/resource2vec-core
11. TranslatingModel @ https://github.com/ZichaoHuang/TranslatingModel
12. wiki2vec (for DBpedia only) @ https://github.com/idio/wiki2vec

7 领域专家

1. Antoine Bordes [https://research.fb.com/people/bordes-antoine/]
2. Estevam Rafael Hruschka Junior（Federal University of Sao Carlos）[http://www.cs.cmu.edu/~estevam/]
3. 鲍捷（Memect） [[http://baojie.org/blog/]]
4. 陈华钧（浙江大学） [http://mypage.zju.edu.cn/huajun]
5. 刘知远（清华大学） [http://nlp.csai.tsinghua.edu.cn/~lzy/]

6. 秦兵（哈尔滨工业大学） [https://m.weibo.cn/u/1880324342?sudaref=login.sina.com.cn&retcode=6102]
7. 赵军（中科院自动化所） http://www.nlpr.ia.ac.cn/cip/jzhao.htm
8. 王昊奋 狗尾草智能科技公司 [http://www.gowild.cn/home/ours/index.html]
9. 漆桂林 东南大学 [http://cse.seu.edu.cn/people/qgl/index.htm]
10. 刘 康 中科院自动化 [http://people.ucas.ac.cn/~liukang]
11. 韩先培 中国科学院软件研究所 [http://www.icip.org.cn/Homepages/hanxianpei/index.htm]
12. 肖仰华 复旦大学 [http://gdm.fudan.edu.cn/GDMWiki/Wiki.jsp?page=Yanghuaxiao]