

CURRICULUM VITAE – LIDONG BING

Senior Researcher, Tencent AI Lab

CONTACT INFORMATION

Address: Langke Building, High Tech South 6th Road,
Nanshan District, Shenzhen city, China. 518000
Tel: +86-18018715657
Email: binglidong@gmail.com
Homepage: <http://www.cs.cmu.edu/~lbing>

POSITIONS HELD

Senior Researcher	2016 - present
Tencent AI Lab	
Postdoctoral Fellow	2015 - 2016
Machine Learning Department, Carnegie Mellon University	
Technical Consultant	2013 - 2014
Web Data Mining (Beijing and Shenzhen teams), Baidu Inc.	
Postdoctoral Fellow	2013 - 2015
SE&EM Department, The Chinese University of Hong Kong	

EDUCATION

Ph.D. in Information Systems	2012
Faculty of Engineering, The Chinese University of Hong Kong.	
M.Sc. in Computer Application	2009
School of EECS, Peking University.	
B.Sc. in Computer Science	2006
School of Computer Science, Northeast Normal University.	

RESEARCH INTEREST

General areas: Natural Language Processing, Text Mining, Artificial Intelligence, Machine Learning.

Specific areas: Text Generation and Summarization, Sentiment Analysis, Information Extraction and Knowledge Base, Medical Data Analytic.

CURRENT PROJECTS

Aspect-oriented Sentiment Analysis

Sentiment analysis is important for many applications, which is particularly true for Tencent because of the large amount of user-generated content. In this project, we develop a few Deep Neural Networks frameworks to tackle aspect-oriented sentiment analysis and aspect term extraction. We have generated some promising results, and some papers were accepted at top venues.

Text Generation and Style Editing

Text Generation is a longstanding research topic, and it attracts special attention from researchers and industry recently because the development of AI techniques and the growing need. I am working on a few text generation projects. In one project, we aim at generating description text for structured data, and in another project, we propose models to rewrite the style of input sentence according to precise rewriting guidance, such as sentiment polarity.

Medical Data Analytics and AI Diagnosis System

In this project, we analyze big medical data from hospitals. One subtask is to comprehend patient treatment records, and another subtask is to develop Deep Learning algorithms to detect tumors in medical images. For a long term, we plan to build a knowledge-enhanced AI diagnosis system in aiding doctors to make more precise and rapid diagnosis and patients to get a first understanding about their conditions.

Biomedical knowledge extraction

This project aims at extracting the rich medicine and disease knowledge from domain specific corpora and constructing a knowledge base with distantly supervised and semi-supervised extraction methods. To improve the quality of distantly-labeled examples and collect more examples, we proposed a bootstrapping framework which propagates the labels in an appropriate graph by exploring coupling constraints such as coordinate term lists and document structures. Another semi-supervised learning framework explores to add regularization constraints on unlabeled data. (Project link: <http://curtis.ml.cmu.edu/gnat/biomed/>)

Learning deep semantic representations in Web search

A semantic space of Web search is learnt from search session data and each of queries, URLs, websites, and keywords is encoded with a distributed representation in the semantic space. We use a set of session graphs to represent search sessions, and the task is cast as a vector learning problem for the graph vertices. Such representation is useful for similarity calculation, search result ranking, etc. This is a joint project with Baidu Inc.

Chinese knowledge base construction

This is a joint project with Web Data Mining group of Baidu Inc. We constructed a Chinese KB by structuralizing Chinese online encyclopedia and extracting knowledge from Web pages via distantly supervised IE and Open IE. We proposed a language-independent framework to tackle the slot filling task by searching the Web with high-precision queries, and deriving lightweight extraction patterns.

Abstractive and compressive news summarization

We proposed new approaches to conduct abstractive and compressive document summarization. The sentences are decomposed into basic semantic units by constituency analysis. An optimization model based on integer linear programming was proposed to generate abstractive and compressive summaries with the units. This is a joint project with Noah's Ark Lab of Huawei Technologies Co. Ltd.

Web page structure analysis and data record detection

Two frameworks were proposed to analyze Web page structure with structured output SVM. They can explore the visual features and DOM structure features, and they have been utilized in Web data record extraction and Web page segmentation tasks.

Distantly and semi-supervised knowledge extraction from data records

This project aimed at extracting entities and their attributes from the extracted data records. A distantly and semi-supervised model with Conditional Random Fields was proposed to learn extractors under the guidance of a proximate record graph.

Probabilistic graphical model based query refinement

A directed probabilistic graphical model was proposed to score candidate queries in the query refinement task. The candidate queries are generated by mining the history query log as well as the online social tagging data.

Ontology enhancement and its application in text mining

A framework was proposed to generate enhanced ontology by merging the entities of online encyclopedias (e.g. Wikipedia) into an existing ontology (e.g. WordNet). An adaptive method was also designed to utilize the enhanced ontology in text mining tasks.

BOOKS

Information Discovery from Semi-structured Record Sets on the Web (First Edition) (Lidong Bing, Wai Lam), ISBN: 978-3-659-20611-5. LAP Lambert Academic Publishing, 2014.

PAPERS

[2018]

Joint Modeling of Participant Influence and Latent Topics for Recommendation in Event-based Social Networks. (Yi Liao, Wai Lam, Lidong Bing, Xin Shen), *ACM Trans. Inf. Syst. (TOIS)*, 2018. (To Appear)

Learning a Unified Embedding Space of Web Search from Large-scale Query Log. (Lidong Bing, Zheng-Yu Niu, Piji Li, Wai lam, Haifeng Wang), *Knowl.-Based Syst. (KBS)*, 2018. (To Appear)

[2017]

Bootstrapping Distantly Supervised IE using Joint Learning and Small Well-structured Corpora. (Lidong Bing, Bhuwan Dhingra, Kathryn Mazaitis, Jong Hyuk Park, and William W. Cohen), *Proceedings of the 31st AAAI Conference on Artificial Intelligence (AAAI)*, 2017.

Salience Estimation via Variational Auto-Encoders for Multi-Document Summarization. (Piji Li, Zihao Wang, Wai Lam, Zhaochun Ren, and Lidong Bing), *Proceedings of the 31st AAAI Conference on Artificial Intelligence (AAAI)*, 2017.

Towards a Language-independent Solution: Knowledge Base Completion by Searching the Web and Deriving Language Pattern. (Lidong Bing, Zhiming Zhang, Wai Lam, William W. Cohen), *Knowl.-Based Syst. (KBS)*, volume 115, 80-86, 2017.

Using Graphs of Classifiers to Impose Declarative Constraints on Semi-supervised Learning. (Lidong Bing, Bhuwan Dhingra, and William W. Cohen), *The 26th International Joint Conference on Artificial Intelligence (IJCAI)*, 2017. (To appear)

Neural Rating Regression with Abstractive Tips Generation for Recommendation. (Piji Li, Zhaochun Ren, Lidong Bing, and Wai Lam), *The 40th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2017. (To appear)

A Deep Recurrent Generative Decoder for Abstractive Text Summarization. (Piji Li, Lidong Bing, and Wai Lam), *Proceedings of Conference*

on Empirical Methods in Natural Language Processing (EMNLP), 2017. (To appear)

Recurrent Attention Networks for Aspect Sentiment Analysis. (Peng Chen, Zhongqian Sun, Lidong Bing*, and Wei Yang), *Proceedings of Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2017. (To appear, *: corresponding author)

Abstractive Document Summarization via Hierarchical Memory Networks. (Piji Li, Wai Lam, Lidong Bing, and Zhengdong Lv), *Proceedings of Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2017. (To appear)

Reader-Aware Multi-Document Summarization: An Enhanced Model and The First Dataset. (Piji Li, Lidong Bing, and Wai Lam), *Proceedings of the EMNLP 2017 Workshop on New Frontiers in Summarization (EMNLP-NewSum)*, 2017. (To appear)

FOX: Fast Overlapping Community Detection Algorithm in Big Weighted Networks. (Tianshu Lyu, Lidong Bing, Zhao Zhang, and Yan Zhang), *Data Mining and Knowledge Discovery (DMKD)*, 2017. (under review)

[2016]

Distant IE by Bootstrapping Using Lists and Document Structure (Lidong Bing, Mingyang Ling, Richard C. Wang, and William W. Cohen), *Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI)*, pp. 2899–2905, 2016.

Unsupervised Extraction of Popular Product Attributes from E-commerce Web Sites by Considering Customer Reviews (Lidong Bing, Tak-Lam Wong, and Wai Lam), *ACM Transactions on Internet Technology (TOIT)*, Volume 16 Issue 2, 12:1–12:17, 2016.

Using Graphs of Classifiers to Impose Constraints on Semi-supervised Relation Extraction (Lidong Bing, William W. Cohen, Bhuwan Dhingra, and Richard C. Wang), *Proceedings of the 5th Workshop on Automated Knowledge Base Construction (AKBC)*, 2016.

Detecting Common Discussion Topics Across Culture From News Reader Comments (Bei Shi, Wai Lam, Lidong Bing, and Yinqing Xu), *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (ACL)*, pp. 676–685, 2016.

CUIS at the NTCIR-12 MobileClick2 Task (Kwun Ping Lai, Wai Lam, and Lidong Bing), *Proceedings of the 12th NTCIR Conference*, 2016.

Digesting Multilingual Reader Comments via Latent Discussion Topics with Commonality and Specificity (Bei Shi, Wai Lam, Lidong Bing, and Yinqing Xu), *Proceedings of The 25th ACM International Conference on Information and Knowledge Management (CIKM)*, pp. 2293–2298, 2016.

Efficient and Scalable Detection of Overlapping Communities in Big Networks (Tianshu Lyu, Lidong Bing, Zhao Zhang, and Yan Zhang), *Proceedings of The IEEE International Conference on Data Mining (ICDM)*, pp. 1071–1076, 2016.

Learning a Semantic Space of Web Search via Session Data (Lidong Bing, Zheng-Yu Niu, Wai Lam, and Haifeng Wang), *Proceedings of the 20th Asia Information Retrieval Societies Conference (AIRS)*, pp. 83–97, 2016.

[2015]

Multilingual Viewpoint Detection from news comments (Bei Shi, Wai Lam, Lidong Bing, and Yinqing Xu), *Proceedings of 2015 International Conference on Asian Language Processing (IALP)*, pp. 189–192, 2015.

Improving Distant Supervision for Information Extraction Using Label Propagation Through Lists (Lidong Bing, Sneha Chaudhari, Richard C. Wang, and William W. Cohen), *Proceedings of Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pp. 524–529, 2015.

A Unified Posterior Regularized Topic Model with Maximum Margin for Learning-to-Rank (Shoaib Jameel, Wai Lam, Steven Schockaert, and Lidong Bing), *Proceedings of the 24th ACM International Conference on Information and Knowledge Management (CIKM)*, pp. 103–112, 2015.

Abstractive Multi-Document Summarization via Phrase Selection and Merging (Lidong Bing, Piji Li, Yi Liao, Wai Lam, Weiwei Guo, Rebecca Passonneau), *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL)*, pp. 1587–1597, 2015.

Reader-Aware Multi-Document Summarization via Sparse Coding (Piji Li, Lidong Bing, Wai Lam, Hang Li, Yi Liao), *Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI)*, pp. 1270–1276, 2015.

Supervised Topic Models with Word Order Structure for Document Classification and Retrieval Learning (Shoaib Jameel, Wai Lam, Lidong Bing), *Information Retrieval Journal*, volume 18, 283–330, 2015.

Web Query Reformulation via Joint Modeling of Latent Topic Dependency and Term Context (Lidong Bing, Wai Lam, Tak-Lam Wong, Shoaib Jameel), *ACM Trans. Inf. Syst. (TOIS)*, volume 33, 6:1–6:38, 2015.

Adaptive Concept Resolution for document representation and its applications in text mining (Lidong Bing, Shan Jiang, Wai Lam, Yan Zhang, Shoaib Jameel), *Knowl.-Based Syst. (KBS)*, volume 74, 1–13, 2015.

Nonparametric Topic Modeling Using Chinese Restaurant Franchise with Buddy Customers (Shoaib Jameel, Wai Lam, Lidong Bing), *Proceedings of the 37th European Conference on Information Retrieval (ECIR)*, pp. 648–659, 2015.

[2014]

Web page segmentation with structured prediction and its application in web page classification (Lidong Bing, Rui Guo, Wai Lam, Zheng-Yu Niu, Haifeng Wang), *Proceedings of the 37th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, pp. 767–776, 2014.

Website Community Mining from Query Logs with Two-Phase Clustering (Lidong Bing, Wai Lam, Shoaib Jameel, Chunliang Lu), *Proceedings of the 15th International Conference on Computational Linguistics and Intelligent Text Processing (CICLing)*, pp. 201–212, 2014.

[2013]

Robust Detection of Semi-structured Web Records Using a DOM Structure-knowledge-driven Model (Lidong Bing, Wai Lam, Tak-Lam Wong), *ACM Trans. Web (TWEB)*, volume 7, 21:1-21:32, 2013.

Web Entity Detection for Semi-structured Text Data Records with Unlabeled Data (Chunliang Lu, Lidong Bing, Wai Lam, Ki Chan, Yuan Gu), *International Journal of Computational Linguistics and Applications*, volume 4, pp. 135-150, 2013.

Wikipedia entity expansion and attribute extraction from the web using semi-supervised learning (Lidong Bing, Wai Lam, Tak-Lam Wong), *Proceedings of the sixth ACM International Conference on Web Search and Data Mining (WSDM)*, pp. 567-576, 2013.

Structured positional entity language model for enterprise entity retrieval (Chunliang Lu, Lidong Bing, Wai Lam), *Proceedings of the 22nd ACM International Conference on Information and Knowledge Management (CIKM)*, pp. 129-138, 2013.

Towards an enhanced and adaptable ontology by distilling and assembling online encyclopedias (Shan Jiang, Lidong Bing, Yan Zhang), *Proceedings of the 22nd ACM International Conference on Information and Knowledge Management (CIKM)*, pp. 1703-1708, 2013.

[PhD study]

Unsupervised Extraction of Popular Product Attributes from Web Sites (Lidong Bing, Tak-Lam Wong, Wai Lam), *Proceedings of the 8th Asia Information Retrieval Societies Conference on Information Retrieval Technology (AIRS)*, pp. 437-446, 2012.

Normalizing web product attributes and discovering domain ontology with minimal effort (Tak-Lam Wong, Lidong Bing, Wai Lam), *Proceedings of the Forth International Conference on Web Search and Web Data Mining (WSDM)*, pp. 805-814, 2011.

Ontology enhancement and concept granularity learning: keeping yourself current and adaptive (Shan Jiang, Lidong Bing, Bai Sun, Yan Zhang, Wai Lam), *Proceedings of the 17th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, pp. 1244-1252, 2011.

Using query log and social tagging to refine queries based on latent topics (Lidong Bing, Wai Lam, Tak-Lam Wong), *Proceedings of the 20th ACM Conference on Information and Knowledge Management (CIKM)*, pp. 583-592, 2011.

Towards a unified solution: data record region detection and segmentation (Lidong Bing, Wai Lam, Yuan Gu), *Proceedings of the 20th ACM Conference on Information and Knowledge Management (CIKM)*, pp. 1265-1274, 2011.

Investigation of Web Query Refinement via Topic Analysis and Learning with Personalization (Lidong Bing, and Lam Wai), *Proceedings of the 2nd SIGIR Workshop on Query Representation and Understanding (SIGIR-QRU)*, 2011.

Learning ontology resolution for document representation and its applications in text mining (Lidong Bing, Bai Sun, Shan Jiang, Yan Zhang, Wai Lam), *Proceedings of the 19th ACM Conference on Information and Knowledge Management (CIKM)*, pp. 1713-1716, 2010.

[Master study]

Weighting Links Using Lexical and Positional Analysis in Web Ranking (Yi Zhang, Yexin Wang, Lidong Bing, Yan Zhang), *Proceedings of the ninth International Conference on Web-Age Information Management (WAIM)*, pp. 9-16, 2008.

Primary content extraction with Mountain Model (Lidong Bing, Yexin Wang, Yan Zhang, Hui Wang), *Proceedings of 8th IEEE International Conference on Computer and Information Technology (CIT)*, pp. 479-484, 2008.

LET: Towards More Precise Clustering of Search Results (Yi Zhang, Lidong Bing, Yexin Wang, Yan Zhang), *Proceedings of the fourth International Conference on Fuzzy Systems and Knowledge Discovery (FSKD)*, pp. 385-389, 2007.

PRESENTATION AND
TALK

Knowledge Extraction from Semi-structured Web Records and Entity-centric Documents. *Noah's Ark Lab of Huawei Inc.* 2016.

Knowledge Extraction from Semi-structured Web Records and Entity-centric Documents. *Department of Computer Science, The University of Iowa.* 2016.

Distant IE by Bootstrapping Using Lists and Document Structure. *AAAI, Phoenix, Arizona USA.* 2016.

Knowledge Extraction from Semi-structured Web Records and Entity-centric Documents. *Department of Computer Science, University of Illinois at Chicago.* 2016.

Knowledge Collection from Unstructured Web Data. *NELL Group, Machine Learning Department, Carnegie Mellon University.* 2015.

Reader Interest-Aware News Summarization for Smart Phone Users. *Noah's Ark Lab of Huawei Inc.* 2014.

Web Page Segmentation with Structured Prediction and its Application in Web Page Classification. *SIGIR, Gold Coast, Australia.* 2014.

Information Discovery from Semi-structured Record Sets on the Web - From Unstructured Web to Knowledge. *Web Data Mining Group of Baidu Inc.* 2014.

Website Community Mining from Query Logs with Two-phase Clustering. *CICLing, Kathmandu, Nepal.* 2014.

Web Knowledge Collection and Web Query Analysis. *Shanghai Jiao Tong University.* 2014.

Abstractive Multi-Document Summarization via Phrase Selection and Merging. *Noah's Ark Lab of Huawei Inc.* 2014.

Information Discovery from Semi-structured Record Sets on the Web - From Unstructured Web to Knowledge. *Fudan University.* 2013.

Wikipedia Entity Expansion and Attribute Extraction from the Web Using Semi-supervised Learning. *WSDM, Rome, Italy.* 2013.

Using Query Log and Social Tagging to Refine Queries Based on Latent Topics. *CIKM, Glasgow, UK.* 2011.

Towards a Unified Solution: Data Record Region Detection and Segmentation. *CIKM, Glasgow, UK.* 2011.

PROFESSIONAL ACTIVITIES

Reviewer of journals

Information Processing and Management, since 2016
 Expert Systems With Applications, since 2016
 Information Processing and Management, since 2016
 Artificial Intelligence Review, since 2015
 ACM Transactions on Information Systems (TOIS), since 2014
 IEEE Transactions on Knowledge and Data Engineering (TKDE), since 2014
 ACM Transactions on the Web (TWEB), since 2014
 ACM Transactions on Intelligent Systems and Technology (TIST), since 2014
 Computational Linguistics, since 2014
 Journal of the Association for Information Science and Technology (JASIST), since 2014
 Knowledge-Based Systems (KBS), since 2014
 Neurocomputing, since 2014
 Neural Networks, since 2014
 Transactions on Asian and Low-Resource Language Information Processing (TALLIP), since 2013
 Neural Computing and Applications Journal (NCA), 2012

PC member of conferences

The 56th Annual Meeting of the Association for Computational Linguistics (ACL), 2018
 International World Wide Web Conference (WWW), 2018
 The 41th International ACM SIGIR Conference on Research and Development in Information Retrieval, 2018
 The 27th International Joint Conference on Artificial Intelligence (IJCAI), 2018
 The 32st AAAI Conference on Artificial Intelligence (AAAI), 2018
 The 21st International Conference on Artificial Intelligence and Statistics (AISTATS), 2018
 The 26th ACM International Conference on Information and Knowledge Management (CIKM), 2017
 The 26th International Joint Conference on Artificial Intelligence (IJCAI), 2017
 The 31st AAAI Conference on Artificial Intelligence (AAAI), 2017
 The 40th International ACM SIGIR Conference on Research and Development in Information Retrieval, 2017
 The 16th China National Conference on Computational Linguistics (CCL), 2017
 The 39th International ACM SIGIR Conference on Research and Development in Information Retrieval, 2016
 The 15th China National Conference on Computational Linguistics (CCL), 2016

The 4th CCF Conference on Natural Language Processing & Chinese Computing (NLPCC), 2015

The 2015 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2015

The 2013 Conference on Empirical Methods in Natural Language Processing (EMNLP), 2013

The 6th International Joint Conference on Natural Language Processing (IJCNLP), 2013

The 9th Asia Information Retrieval Societies Conference (AIRS), 2013

The 8th Asia Information Retrieval Societies Conference (AIRS), 2012

OTHER PROJECT EXPERIENCES

Query ReWrite (QRW) project in Alibaba Search Center

In the project, the query logs from ecommerce platforms were mined to discover highly related queries and generate highly reliable patterns. The mining results were utilized in two directions, namely, query recommendation and query reformulation. The project was online in 2008.

Design and implementation of a price comparison system “CoolBee”

“CoolBee” vertical search and comparison system aims at providing users a convenient way of finding the lowest price of one product in different online shopping websites.

Design and implementation of a search engine prototype “YiDu”

In “YiDu” project, the basic modules of a Web search engine were implemented, including crawler, inverted indexer, PageRank, dynamic abstract, etc.

STUDENT MENTORING

Bhawna Juneja (Carnegie Mellon University, 2015)

Mingyang Ling (Carnegie Mellon University, 2015)

Sneha Chaudhari (Carnegie Mellon University, 2015)

Tianshu Lyu (Peking University, 2015)

Kwun Ping Lai (The Chinese University of Hong Kong, 2015)

Piji Li (The Chinese University of Hong Kong, 2014 - 2015)

Bei Shi (The Chinese University of Hong Kong, 2014 - 2015)

Yi Liao (The Chinese University of Hong Kong, 2013 - 2014)

Shan Jiang (Peking University, 2011 - 2013)

TEACHING EXPERIENCE

Mentor, *undergraduate final year project on Multi-Document Summarization*.
The Chinese University of Hong Kong, 2013.

Teaching Assistant, *E-Commerce Data Mining*.
The Chinese University of Hong Kong, Fall Semester in 2011.

Teaching Assistant, *Computer Processing System Concepts*.
The Chinese University of Hong Kong, Spring Semester in 2010, 2011 and 2012.

Teaching Assistant, *Digital Logic and Systems*.

The Chinese University of Hong Kong, Fall Semester in 2009 and 2010.

HONOR AND
FELLOWSHIP

Staff Travel Grant, The Chinese University of Hong Kong, 2013 and 2014

Postdoctoral Fellowship of Faculty of Engineering, The Chinese University of Hong Kong, 2013

Postgraduate Student Travel Grant, The Chinese University of Hong Kong, 2011

Postgraduate Scholarship, The Chinese University of Hong Kong, 2009 - 2012

Outstanding Scholarship of CNPC, Peking University, 2008

Second Grade Scholarship, Northeast Normal University, 2006

Second Grade National Scholarship, 2005

First Grade Scholarship, Northeast Normal University, 2003, 2004 and 2005

Outstanding Graduate, Northeast Normal University, 2006

Outstanding University Student, Changchun city, 2005

NATURAL LANGUAGE Mandarin Chinese (Native), English (Fluent)