

## Academic Background

- PostDoc Fellow **Harvard University**  
2019.07 - Now School of Engineering and Applied Science, Harvard University  
Advisor Prof. Stratos Idreos
- Ph.D. **The University of Hong Kong (HKU)**  
2015.07 - 2019.05 Department of Computer Science, HKU  
Recipient of Hong Kong PhD Fellowship (**HKPFS**)  
Advisors Prof. Ben Kao, Prof. Reynold Cheng  
Thesis Adaptive Optimization Techniques in Graph-based Applications
- M.S. **Fudan University (FDU)**  
2010.09 - 2013.06 School of Computer Science, FDU  
Advisor Prof. Shuigeng Zhou.  
Thesis Distributed Systems for Keyword Search on Road Networks
- B.S. **Fudan University (FDU)**  
2006.09 - 2010.06 School of Computer Science, FDU

## Research Interest

I am broadly interested in large-scale data management systems, particularly in the aspects of adaptive optimization and distributed computation in data systems. Most of my publications appear in top journals/conferences including SIGMOD, VLDB, ICDE, ICML, WWW, AAAI, TKDE, VLDBJ, EDBT.

## Publications

- [1] **Siqiang Luo**, "Improved Communication Cost in Distributed PageRank Computation – A Theoretical Study", **ICML** 2020.
- [2] **Siqiang Luo**, Subarna Chatterjee, Rafael Ketsetsides, Niv Dayan, Wilson Qin, Stratos Idreos, "Rosetta: A Robust Space-Time Optimized Range Filter for Key-Value Stores", **SIGMOD** 2020.
- [3] **Siqiang Luo**, Reynold Cheng, Ben Kao, Xiaokui Xiao, Shuigeng Zhou, Jiafeng Hu. "ROAM: A Fundamental Routing Query on Road Networks with Efficiency", **TKDE** 2019 .
- [4] **Siqiang Luo**, Ben Kao, Xiaowei Wu, Reynold Cheng, "MPR – A Partitioning-Replication Framework for Parallel-Processing  $k$ NN Search on Road Networks", **ICDE** 2019 .
- [5] **Siqiang Luo**, Xiaokui Xiao, Wenqing Lin, Ben Kao, "Baton: Batch One-Hop Personalized PageRanks with Efficiency and Effectiveness", **TKDE** 2019 .
- [6] **Siqiang Luo**, Xiaokui Xiao, Wenqing Lin, Ben Kao, "Efficient Batch One-Hop Personalized PageRanks", research short paper, **ICDE** 2019 .
- [7] **Siqiang Luo**, "Distributed PageRank Computation: An Improved Theoretical Study", **AAAI** 2019 (*spotlight paper*).
- [8] **Siqiang Luo**, Ben Kao, Guoliang Li, etc., "TOAIN: A Throughput Optimizing Adaptive Index for Answering Dynamic  $k$ NN Queries on Road Networks", **VLDB** 2018 .
- [9] **Siqiang Luo**, Jiafeng Hu, Reynold Cheng, etc., "SEQ: Example-based Query for Spatial Objects", research short paper, **CIKM** 2017
- [10] **Siqiang Luo**, Yifeng Luo, Shuigeng Zhou, Gao Cong, Jihong Guan, Zheng Yong, "Distributed Spatial Keyword Querying on Road Networks", **EDBT** 2014 .

- [11] **Siqiang Luo**, Yifeng Luo, Shuigeng Zhou, Gao Cong, Jihong Guan, "*DISKs: A System for Distributed Spatial Group Keyword Search on Road Networks*", *demo track, VLDB 2012*
- [12] **Siqiang Luo**, Junping Zhang, Qian Zhang, Xiaoru Yuan, "*Multi-Operator Image Retargeting with Automatic Integration of Direct and Indirect Seam Carving*", *Image and Vision Computing*, 2012.
- [13] Yixiang Fang, Zheng Wang, Reynold Cheng, Xiaodong Li, **Siqiang Luo**, Jiafeng Hu, Xiaojun Chen, "*On Spatial-Aware Community Search*", *TKDE 2018*
- [14] Jiafeng Hu, Xiaowei Wu, Reynold Cheng, **Siqiang Luo**, Yixiang Fang, "*On Minimal Steiner Maximum-Connected Subgraph Queries*", *TKDE 2017*
- [15] Yixiang Fang, Reynold Cheng, **Siqiang Luo**, Jiafeng Hu, and Kai Huang, "*C-Explorer: Browsing Communities in Large Graphs*", *demo track, VLDB 2017*
- [16] Yixiang Fang, Reynold Cheng, Yankai Chen, **Siqiang Luo**, Jiafeng Hu, "*Effective and Efficient Attributed Community Search*", *VLDB Journal 2017*
- [17] Yixiang Fang, Reynold Cheng, Xiaodong Li, **Siqiang Luo**, Jiafeng Hu, "*Effective Community Search over Large Spatial Graphs*", *VLDB 2017*
- [18] Yixiang Fang, Reynold Cheng, **Siqiang Luo**, Jiafeng Hu, "*Effective Community Search for Large Attributed Graphs*", *VLDB 2016*
- [19] Jiafeng Hu, Xiaowei Wu, Reynold Cheng, **Siqiang Luo** and Yixiang Fang, "*Querying Minimal Steiner Maximum-Connected Subgraphs in Large Graphs*", *CIKM 2016*
- [20] Diwen Zhu, Hui Ma, Xiaokui Xiao, **Siqiang Luo**, Youze Tang, Shuigeng Zhou, "*Shortest Path and Distance Queries on Road Networks: Towards Bridging Theory and Practice*", *SIGMOD 2013*
- [21] Xiang Li, Ben Kao, **Siqiang Luo**, Martin Ester, "*ROSC: Robust Spectral Clustering on Multi-scale Data*", *WWW 2018*
- [22] Jiafeng Hu, Reynold Cheng, Zhipeng Huang, Yixiang Fang, **Siqiang Luo**, "*On Embedding Uncertain Graphs*", *CIKM 2017*
- [23] Yifeng Luo, **Siqiang Luo**, Jihong Guan, Shuigeng Zhou, "*A RAMCloud Storage System based on HDFS: Architecture, Implementation and Evaluation*", *Journal of Systems and Software*, 2013

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## In Submission

- [1] **Siqiang Luo**, Xiaowei Wu, Ben Kao, "*Radar-Push: A Distributed Algorithm for Computing PageRank with Improved Complexities*", *Submitted to TKDE 2020*.
- [2] Peng Zhu, Dawei Cheng, **Siqiang Luo**, Fangzhou Yang, Yifeng Luo, Weining Qian, Aoying Zhou, "*SI-News: Integrating Social Information for News Recommendation with Attention Graph Convolutional Network*", *Submitted to NIPS 2020*.
- [3] Peng Zhu, Dawei Cheng, **Siqiang Luo**, Fangzhou Yang, Yifeng Luo, Weining Qian, Aoying Zhou, "*SDI-NER: Employing Semantic Dependency to Recognize Chinese Named Entities with Graph Neural Network*", *Submitted to NIPS 2020*.
- [4] Mengzhen Fan, Dawei Cheng, Fangzhou Yang, Yifeng Luo, **Siqiang Luo**, Weining Qian, Aoying Zhou, "*Fusing Global Domain Information and Local Semantic Information to Classify Financial Documents*", *Submitted to CIKM 2020*.

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## Working Papers

- [1] **Siqiang Luo\***, Zichen Zhu\*, Xiaokui Xiao, Yin Yang, "*Vertex-Centric Graph Systems Revisited: An Experimental Evaluation for Multi-Tasks Processing*", *In preparation for VLDB 2021*.
- [2] **Siqiang Luo**, Haojie Shi, Ben Kao, Xiaowei Wu, Reynold Cheng, "*Adaptive Partitioning-Replication Framework for Parallel  $k$ NN Search*", *In preparation for TKDE (journal extension of ICDE 2019 paper)*.
- [3] **Siqiang Luo**, Subarna Chatterjee, Rafael Ketsetsides, Niv Dayan, Wilson Qin, Stratos Idreos, "*Optimized Range Filter for Key-Value Stores*", *in preparation for VLDBJ (journal extension of SIGMOD 2020 paper)*.

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## Patents

CN101609547B **Siqiang Luo**, Junping Zhang, "*Seamless Image Processing based on Accumulative Energy*"

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## Full Research Experience

- July. 2019 - Now Postdoctoral Fellow & Teaching Fellow  
**Harvard University, US**  
Project Range Filter in Key-Value Stores.  
Working with Prof. Stratos Idreos
- Jan. 2019 - Apr. 2019 Visiting Researcher  
**AI Theory Group, University of Cambridge, UK**  
Project Distributed Algorithms for PageRank Computation.  
Working with Prof. Thomas Sauerwald
- Jul. 2015 - May. 2019 PhD Researcher  
**Database Group, The University of Hong Kong, China**  
Thesis Adaptive Optimization Techniques in Graph-based Applications.  
Working with Prof. Ben Kao, Prof. Reynold Cheng
- Jun. 2017 - Sep. 2017 Research Assistant  
**Database Group, Nanyang Technological University, Singapore**  
Project Parallel Algorithms for Personalized PageRanks for Billion-edge Social Networks.  
Working with Prof. Xiaokui Xiao
- Jul. 2016 - Aug. 2016 Research Assistant  
**Database Group, Tsinghua University, China**  
Project Automatic Index Configurations for Optimizing Location-based Systems.  
Working with Prof. Guoliang Li
- Sep. 2011 - Jun. 2012 Research Assistant  
**Database Group, Nanyang Technological University, Singapore**  
Project Efficient Shortest Path Queries with Theoretical Guarantees.  
Working with Prof. Xiaokui Xiao
- Jun. 2009 - Sep. 2010 Research Assistant  
**Database Group, Shanghai Key Lab of Intelligent Information Processing, China**  
Project Distributed Keyword Search on Graph Data with Hadoop.  
Advisor Prof. Shuigeng Zhou
- Jan. 2008 - Jun. 2009 Research Assistant  
**Machine Learning Group, Shanghai Key Lab of Intelligent Information Processing, China**  
Project Content-aware Image Resizing.  
Working with Prof. Junping Zhang

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## Industrial Experience

- Aug. 2013 - May. 2015 **Full-Stack Research&Developer Engineer**  
Company Works Applications Co., Ltd, Shanghai  
Project Developed a number of modules of an ERP system known as AI Works (referenced [here](#)), such as:  
• Magic-Paste: analyze the pasted content (e.g., a webpage) for auto-completion.  
• Flexible-Report-System: allow the user to manage the style of a report by drag-and-drop.
- Jul. 2012 - Sep. 2012 **Software Development Engineer Intern**  
Company Microsoft, Beijing
- Jul. 2009 - Sep. 2009 **Data Engineer Intern**  
Company Shanda Games Limited, Shanghai

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## Selected Awards

- Dec. 2015 Hong Kong PhD Fellowship (a prestigious award for excellent fresh PhDs)

Jul. 2013 Outstanding Graduates of Shanghai (top 5%)  
 Oct. 2012 Intel Fellowship (5 out of 3,000 students)  
 Nov. 2012 National Scholarship (top scholarship in China)  
 Nov. 2012 Tung OOCL Award (5 out of 600 students)  
 May. 2010 1st Prize scholarship for fresh graduate student  
 May. 2010 Wang-Dao Scholar (top 1% of Fudan students)  
 May. 2008 National Scholarship for Encouragement  
 Oct. 2005 1st Prize of National Mathematical Olympiad in Senior  
 Oct. 2004 1st Prize of National Mathematical Olympiad in Senior

## Teaching Experience

Teaching Fellow CS265 (Big Data Systems), Harvard University, 2020 Spring  
 Teaching Fellow CS165 (Database Systems), Harvard University, 2019 Fall  
 Teaching Assistant CCST 9047 (The Age of Big Data.), The University of Hong Kong, 2017  
 Teaching Assistant CCST 9047 (The Age of Big Data.), The University of Hong Kong, 2016  
 Teaching Assistant COMP 2396 (Object-oriented Programming.), The University of Hong Kong, 2015  
 Teaching Assistant C Programming, Fudan University, 2012

## Professional Activities

Reproducibility SIGMOD 2019  
 Committee  
 Program Committee WISE 2019, WISE 2020, ACM TURC (SIGMOD China) 2020  
 Invited Reviewers (1) TKDE; (2) Geoinformatica; (3) IEEE Access; (4) IEEE Transactions on Big Data; (5) Transactions on Spatial Algorithms and Systems  
 External Reviewers IEEE TKDE, SIGMOD 16,17,18; VLDB 13, 16,17,18; ICDE 16,17,18,19; KDD 17,18,19,20; EDBT 13,16; CIKM 17; DASFAA 18; BigData 15; WAIM 13  
 Summer Schools VLDB 2010, VLDB 2011

## Selected Talks

Dec. 2019 Fudan University  
 Title One Design Does Not Fit All – Adaptive Optimization Techniques in Data Management  
 Mar. 2019 Emmanuel College, University of Cambridge, United Kingdom  
 Title Distributed PageRank Computation with Improved Complexities  
 Apr. 2019 ICDE2019@Macau, China  
 Title MPR : A Partitioning-Replication Framework for Multi-Processing kNN Search on Road Networks  
 Jan. 2019 AAAI2019@Honolulu, United States  
 Title Distributed PageRank Computation: An Improved Theoretical Study  
 Jan. 2019 University of Cambridge, United Kingdom  
 Title Adaptive Approaches for Performance Optimization in Graph-based Applications  
 Aug. 2018 VLDB2018@Brazil  
 Title TOAIN: A Throughput Optimization Adaptive Index for Answering kNN Queries on Road Networks  
 July. 2018 Summer Intern Day @ University of Hong Kong, Hong Kong, China  
 Title Throughput Optimization Indexing for  $k$ NN Systems

## Selected Projects

2008-2010 Content-Aware Image Resizing  
**Student PI**, Wangdao Research Program, Fudan University  
 2017 Novel Applications of Big Transportation Data  
**Student PI**, Pilot Scheme Program on International Experience, the University of Hong Kong