Lingkun Kong

https://lk21.web.rice.edu

Email : klk@rice.edu
6100 Main St, MS 132

EDUCATION

Rice University Houston, TX
Department of Computer Science *Aug. 2018 – now*
  Ph.D. Candidate,   GPA: 4.0/4.0

Shanghai Jiao Tong University Shanghai, China
Department of Computer Science & Zhiyuan College *Jul. 2014 – Jul. 2018*
  B.S. in Computer Science with Honors, GPA: 3.9/4.0

RESEARCH INTERESTS

Data Stream Processing, Programming Languages, Big-Data Systems

WORK EXPERIENCE

Facebook May. 2021 - Aug. 2021
Summer intern in Data Infrastructure Privacy team
Goal: The Policy Evaluation Service (PES) performs static analysis over SQL queries to determine whether they cause unsafe data flows. My intern project is about reducing the latency of PES by inserting a cache of SQL templates.
  1. Finished the project four weeks before the expected deadline, which includes generalizing queries as templates, matching queries with templates, and generating PES checking results based on cached data.
  2. Implemented a cache with a 77% cache hit rate, which is close to the theoretical maximum value (i.e., $< 84\%$).
  3. Analyzed the PES performance after adding the cache. In analysis, cache hits improve the responding speed by an order of magnitude (30x faster). Cache misses add little overhead ($< 3\%$ latency) to the full PES analysis. Adding the cache reduces the latency by 89% in the P50 case and 73% in the P99 case.

RESEARCH PROJECTS

Parallel Stream Processing with the Preservation of Sequential Semantics Aug. 2020 - now
Research Assistant, supervised by Dr. Konstantinos Mamouras
Goal: to design a language that supports the parallel processing of data streams with the preservation of semantics.
  1. Proposed a language that provides high-level abstractions to ease the programming of parallel stream processing.
  2. Provided a mechanism that, for a query, supports the preservation of the sequential semantics for its parallel implementation, even if the implementation involves complex nesting of parallel computations.
  3. Implemented the language in a Java library and, in benchmarking, showed it consistently provides better scalability than other state-of-the-art tools even though it pays additional overheads to preserve the semantics.

Query Language for Complex Analysis over Data Streams Aug. 2018 - 2020
Research Assistant, supervised by Dr. Konstantinos Mamouras
Goal: to design and implement a language that facilitates the complex analyses over data streams.
  1. Proposed a language that provides high-level programming abstractions for stream processing and gave a formal denotational semantics for the programming model.
  2. Implemented the language in a Java library with a rich set of stream operators and, in benchmarking, showed it is on average 5 times faster than other state-of-the-art tools.
  3. Used the proposed language to prototype algorithms for real applications, including healthcare monitoring and the analysis of high-frequency market.

Acemap: *Academic Map System* Jun. 2015 - Dec. 2017
Research Assistant, supervised by Dr. Xinbing Wang
Goal: to analyze the big data constructed as academic networks, which contains massive academic information including paper, author, research topic, and etc.
  1. Developed visualizing applications for academic information networks and presentation approaches.
  2. Implemented the paper recommendation algorithms, presented it on website, and published a patent.
  3. Created two statistic models, EBM and MSM, for academic network analysis.

PUBLICATIONS

L. Kong, K. Mamouras. *StreamQL: A Query Language for Processing Streaming Time Series*, accepted by OOPSLA, 2020.

J. Huang, **L. Kong**, L. Kong, Z. Liu, Z. Liu and G. Chen. *Blockchain-based Crowd-sensing System*, HotICN 2018.

L. Fu, S. Ma, **L. Kong**, S. Shi, X. Wang, *FINE: A Framework for Distributed Learning on Incomplete Observations for Heterogeneous Crowdsensing Networks*, IEEE ToN 2018.

SELECTED SCHOLARSHIP & HONORS

China National Scholarship *highest honor for undergraduates in China, top 0.2% nationwide* *2015 & 2017*
Zhiyuan Honor Scholarship *award for academic performance* *2014 & 2015 & 2016 & 2018*