

## EDUCATION

### Rice University

Department of Computer Science  
Ph.D. Candidate, GPA: 4.0/4.0

Houston, TX

Aug. 2018 – now

### Shanghai Jiao Tong University

Department of Computer Science & Zhiyuan College  
B.S. in Computer Science with Honors, GPA: 3.9/4.0

Shanghai, China

Jul. 2014 – Jul. 2018

### Cornell University

Computer Science Department, Visiting Student  
Course: Programming Languages and Logics (Grade: A)

Ithaca, NY

Jun. – Jul. 2017

## RESEARCH INTERESTS

Programming Languages, Data Stream Processing, Big-Data Systems, Formal Methods

## RESEARCH PROJECTS

### Query Language for Detecting Complex Patterns in Data Streams

Aug. 2018 - Now

Research Assistant, supervised by [Dr. Konstantinos Mamouras](#)

Goal: to design and implement a language for detecting complex patterns over data streams.

Proposed a language that provides high-level programming abstractions for stream processing and gave a formal denotational semantics for the programming model.

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.

Developed prototyped streaming algorithm for real applications, including healthcare, high-frequency market analysis, wearable device monitoring, and predictive maintenance.

### Formally Verified Data Stream Processing System

May. 2019 - Now

Research Assistant, supervised by [Dr. Konstantinos Mamouras](#)

Goal: using formal methods, to build stream processing engines with correctness guarantee.

Designed a stream processing engine with clear and formal semantics inspired by Stanford's STREAM project.

Implemented the engine by a functional programming language provided in Coq, a formal proof management system.

Verified the correctness of stream engine by formal mathematical proofs in Coq.

### Bancor Simulator: Simulator for Market Analysis under Bancor Protocol

Jan. 2018

Research Assistant, supervised by [Dr. Emin Gün Sirer](#)

Goal: to validate the robustness and efficiency of Bancor protocol, a standard that converts virtual currencies.

Proposed and built the simulation model for both Bancor market and classic market.

Revealed that the Bancor protocol is flawed by experimntal results.

1. The problem about "Double Coincidence of Wants" Bancor wants to solve is unsubstantiated in real world.

2. The price of smart token may fluctuate significantly, as Bancor neglects potential human behavior.

3. Severe cancellation of concurrent transactions occur to Bancor under limited order.

## PUBLICATIONS

**L. Kong**, K. Mamouras. *StreamQL: A Query Language for Efficient Data Stream Processing*, OGHPC 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.

## GRADUATE COURSEWORK

**COMP 582** [Design and Analysis of Algorithms](#) (Grade: A<sup>+</sup>)

Fall 2019

**COMP 509** [Advanced Logic in Computer Science](#) (Grade: A)

Fall 2019

**COMP 581** [Compiler Construction](#) (Grade: A)

Spring 2019

**COMP 511** [Principles of Programming Languages](#) (Grade: A)

Spring 2019

**COMP 557** [Artificial Intelligence](#) (Grade: A)

Fall 2018

**COMP 554** [Computer Systems Architecture](#) (Grade: A<sup>+</sup>)

Fall 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