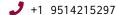
# Xiao Li, Ph.D. Candidate

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## **Research Objective**

I'm a fifth-year Ph.D. candidate. My research interest spans over the theory and practice of **distributed systems**, **programming languages** and **computer security**. I'm particularly interested in **Byzantine fault-tolerant replication** and **program synthesis** in distributed systems..

#### **Education**

2019 – Present

Ph.D. Candidate, University of California, Riverside, USA in Computer Science. GPA:3,88/4

2017 - 2019

M.Sc., University of California, Riverside, USA in Computer Science. GPA: 3.88/4 (Transferred to Ph.D. program)

2013 - 2017

**B.E., Huazhong University of Science and Technology, China** in Information Security. GPA: 3.65/4 (Outstanding Graduates)

2016

Summer Intern, The University of Singapore, Singapore

### **Employment**

2023 Fall

**Research Engineer Intern.** Chainlink Labs.

2019 – Present

**Graduate Student Researcher.** UC Riverside.

# **Research Projects**

2023 – Present

- **Reconfiguratble clustered Byzantine replication**) (under review) Advisor: Prof. Mohsen Lesani
  - Design replication protocols that enable higher throughput with heterogeneous reconfigurable clusters.

2022 - Present

- Reconfiguratble Heterogeneous Quorum Systems) (under review) Advisor: Prof. Mohsen Lesani
  - Design reconfiguration protocols for heterogeneous quorum systems (HQS) to enable open membership for permissioned blockchains.
  - Present a graph characterization of HQS, and its application for reconfiguration optimization.
  - Implement the reconfiguration protocols in Stellar-core framework with C++.

2022 - 2023

- On the power of quorum subsumption for heterogeneous quorum systems (will appear in DISC 2023) Advisor: Prof. Mohsen Lesani
  - Prove an impossibility result that shows quorum intersection and quorum availability are not sufficient for Byzantine reliable broadcast (BRB) and consensus in HQS setting.
  - Propose quorum-subsumption to help achieve BRB and consensus with detailed protocols and correctness proofs.

## **Research Projects (continued)**

2020 - 2022

- Hamraz: Resilient Partitioning and Replication (published in <u>S&P 2022</u>) Advisor: Prof. Mohsen Lesani
  - Present a security-typed object-based language and an information flow type inference system to automatically synthesis trustworthy-by-construction distributed system.
  - Design and implement a CPS transformation and program partitioning system in Java.
  - Design and implement a type inference system to generate verification conditions in Python and Z<sub>3</sub> framework.

2019 - 2020

- **Hampa: Solver-aided Recency-Aware Replicated Objects** (published and artifact evaluated in *CAV 2020*) Advisor: Prof. Mohsen Lesani
  - Design a relational object language, its denotational semantics and syntax-directed analysis to infer optimum staleness bounds.
  - Design and implementation of Java module to generate verification conditions in CVC<sub>4</sub> framework.
  - Design and experiment synthesised run-time system on top of BFT-SmaRt library and SMT solver.

2016 - 2017

- Research and Implementation of Identification Authentication System Based on Face Recognition (Bachelor Thesis) Advisor: Prof. Yongquan Cui
  - Implement a facial recognition system based on Principal Components Analysis and Linear Discriminating Analysis.

2014 - 2015

- Conditional Identity-based Broadcast Proxy Re-Encryption and Its Application to Cloud E-mail Advisor: Prof. Peng Xu
  - Lead a team to implment a prototype for a cloud email system based on CIBPRE and obtained *3rd Prize* in the 8th National College Student Information Security Contest.

#### **Publications**

- Li, X., Chan, E., & Lesani, M. (2023). On the power of quorum subsumption for heterogeneous quorum systems, In Disc'23 (international symposium on distributed computing).
- 2 Li, X., Houshmand, F., & Lesani, M. (2022). Hamraz: Resilient partitioning and replication, In S&p'22 (ieee symposium on security and privacy).
- Li, X., Houshmand, F., & Lesani, M. (2020). Hampa: Solver-aided recency-aware replication, In *International conference on computer aided verification*. Springer.

#### **Technical Skills**

Object-Oriented Programming Languages

Java, Python, C++.

SMT Solvers (SMT-LIB)

**Z**3, CVC4.

Databases

SQL (PostgreSQL).

Others Version Control (Git), LaTeX.

### **Awards and Achievements**

Grace Hopper Conference Scholarship 2023, UC Riverside.

Dissertation Year Program Fellowhip 2023/2024, UC Riverside.

2022 Student Travel Grant, 2022 ACM CCS.

**GSA Travel Award**, UC, Riverside.

## Awards and Achievements (continued)

- **Student Travel Award**, 2022 IEEE Symposium on Security and Privacy.
- Selected and Funded, PLMW@SPLASH 2021.
- 2019 **Department Fellowship Award**, UC, Riverside.
- 2017 **Quistanding Graduates**, Huazhong University of Science and Technology.
- 2016 **Quistanding Academic Award**, Huazhong University of Science and Technology.
- Third Prize, in the 8th National College Student Information Security Contest.
- 2014 **Public Welfare Scholarship**, Huazhong University of Science and Technology.