

Kia Rahmani

PHD CANDIDATE

✉ rahmank@purdue.edu | 🌐 kiarahmani.github.io | 🔗 Kiarahmani | 🐦 @MDDBACA

Education

Purdue University

West Lafayette, IN

PHD IN COMPUTER SCIENCE

2021 (expected)

- **Advisors:** Dr. Suresh Jagannathan and Dr. Benjamin Delaware
- **Thesis Topic:** Compilation and synthesis of modern database-backed programs

Purdue University

West Lafayette, IN

MS IN COMPUTER SCIENCE

2020

- **Courses:** Advanced Topics In Programming Languages, Computer-aided Program Reasoning, Programming Languages, Operating Systems, Information Security, Formal Methods In Databases, Parallel Computing, Algorithm Design and Implementation, Distributed Database Systems, Simulation And Modeling Of Computer Systems

Sharif University of Technology

Tehran, Iran

BS IN COMPUTER SCIENCE

2015

- **Thesis:** Three-Ballot Voting System: Design Principles and Attacks

Publications

OOPSLA'19: CLOTHO: Directed Test Generation for Weakly Consistent Database Systems

- Kia Rahmani, Kartik Nagar, Benjamin Delaware and Suresh Jagannathan

PaPoC'18: Fine-grained distributed consistency guarantees with effect orchestration

- Kia Rahmani, Gowtham Kaki and Suresh Jagannathan

Skills

Programming: Java, C, Haskell, System/Network Coding

Database: Cassandra, Apache Ignite, CockroachDB, PostgreSQL, MySQL

Misc: Z3, Git, AWS, Coq, Jepsen, \LaTeX

Projects

Automated Concurrency Bug Repair via Database Schema Refactoring

2019-present

- In this ongoing project, we are investigating the possibility of eliminating concurrency bugs in applications of weakly-consistent storage systems, through a series of schema refactoring steps, guided by the set of abstract anomalies which are statically found in the program

Directed Test Generation for Weakly Consistent Databases

2017-2019

- We designed a novel and fully automated testing framework for detecting serializability violations in (SQL) database-backed Java applications executing on weakly-consistent storage systems. Our approach combines a static analyzer and a model checker to generate abstract executions, discover serializability violations in these executions, and translate them back into concrete test inputs suitable for deployment in a test environment

Fine-grained distributed consistency guarantees with effect orchestration

2016-2017

- In this project, I leveraged declarative axiomatic specifications of necessary constraints that any correct implementation of weakly consistent data stores must satisfy, to guide a light-weight run-time consistency enforcement tool written in Haskell

Coq implementation of Quelea

2015-2016

- I formalized and implemented the operational semantics introduced in PLDI'15 paper, *Declarative Programming over Eventually Consistent Data Stores*, in the Coq proof assistant (source available)

Teaching Experience

Purdue University Teaching Assistant: Principles and Practices of Compilers (2018), Programming Languages (2019)
Sharif University Teaching Assistant: Mathematical Logic (2014)
Helli High School Teacher: C programming Course (2010-2013)

References

Suresh Jagannathan Professor, Department of Computer Science, Purdue University
Phone: 765-494-0971 - Email: suresh@cs.purdue.edu

Benjamin Delaware Assistant Professor, Department of Computer Science, Purdue University
Email: bendy@purdue.edu