

# Chaoshuai Li

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BIRTH: December, 1998



## Education

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Hebei University of Science & Technology	Sep 2020 - present
School of Information Science and Engineering	
Computer Science and Technology Master	Shijiazhuang, China
Supervisor: Associate Prof. Yang Zhang	
Shenyang Aerospace University	Sep 2016-Jun 2020
Computer Science and Technology Bachelor	Shenyang, China

## Research Experience

Research Interests:

**Program Analysis, Software Refactoring, Parallel Programming, Intelligent Software.** My recent research includes a study of automatic refactoring approaches for switch statements. A switch statement is frequently used with the advantage of handling multi-way branches and with the disadvantage of fall-through semantics that makes programs error-prone. We presents a refactoring tool *ReSwitcher* that can automatically (i) remove the fall-through semantics from a switch statement; and (ii) convert a switch statement into a switch expression. Several static analyses, such as visitor pattern analysis, alias analysis, control flow analysis, and scoping analysis are leveraged in this approach. I have a strong interest in program analysis, and also interested in software refactoring and automatic software repair. Recently I have also been looking at ways to reduce the occurrence of lock contention in object-oriented languages and to help developers design more efficient concurrent programs.

Publications:

1. Zhang, Yang, **Chaoshuai Li**, and Shuai Shao. "ReSwitcher: Automatically Refactoring Java Programs for Switch Expression." *2021 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)*. IEEE, 2021.
2. Shuai Hong, Yang Zhang, **Chaoshuai Li**, Yu Bai. ReInstancer: Automatically Refactoring for Instanceof Pattern Matching. The 44th International Conference on Software Engineering (ICSE' 2022). May 8-20, 2022. Pittsburgh, PA, USA.
3. 纪铭涵, 齐 林, 张 杨, 董士程, **李朝帅**. 面向异步机制的自动重构方法研究[J]. 河北科技大学学报, 2021, 42 (5) : 499-507.

Projects:

1. Innovation Foundation Project of Hebei Province (\*\*\*).
  - Investigate the bad effects that fall-through semantics introduce into switch statements and design algorithms to detect fall-through semantics in source programs.

- Designed the pre-conditions for the refactoring through program analysis such as control flow analysis, scoping analysis and alias analysis.
  - Designed the refactoring algorithm to 1) remove the fall-through semantics from a switch statement, and 2) convert a switch statement into a switch expression.
  - Implement refactoring tool, called ReSwitcher.
2. Scientific Research Foundation of Hebei Educational Department (\*\*\*).
    - Implemented a prototype refactoring tool leveraging WALA, and the prototype is integrated as a plug-in of Eclipse.
    - Evaluated the effectiveness and efficiency of the tool in eleven real-world applications including HSQLDB, Jenkins, Cassandra, etc. Experimental results show that the tool can effectively refactor locks.

#### Conference:

1. Give a presentation of our paper at ICSE'2022 2022.
2. Give a presentation of our paper at ISSRE'2021 2021.

#### Awards

1. National Inspirational Scholarship, Shenyang Aerospace University 2018-2019.
2. National Inspirational Scholarship, Shenyang Aerospace University 2017-2018.
3. Multiple second class and third class scholarships for the university, Shenyang Aerospace University. 2016-2020

#### Skills

1. Proficient in Java, and familiar with C/C++ and Python.
2. Proficient in applying static program analysis, familiarity with LLVM and inter-process analysis.
3. Frequent user of WALA and Eclipse JDT.

#### Qualification

1. Qualification of Computer and Software Professional (Software Designer).

#### Courses Taken

Data Structures, Principles of Computer Composition, Operating Systems, Principles of Compilation, Principles of Computer Networks, Microcontrollers, Principles of Databases, Artificial Intelligence, Parallel Programming, Computer Vision, Data Warehousing and Data Mining, Information Security Technology, Matlab Language and Mathematical Modelling, etc.