

# 刘晴

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## 教育背景

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|----------------------------------|----------------|-----------------------------|----|
| 2018/09-至今                       | 中国科学院大学（软件研究所） | 软件工程专业                      | 硕士 |
| ◆ 绩点：3.36                        |                | 课程：算法设计、软件工程、大数据系统、数理逻辑     |    |
| ◆ 获奖：中国科学院大学 2018-2019 学年二等学业奖学金 |                |                             |    |
| 2013/09-2017/06                  | 大连理工大学         | 软件工程专业                      | 学士 |
| ◆ 成绩：83.21（排名 20%）               |                | 课程：数据结构、数据库、计算机网络、操作系统、软件工程 |    |
| ◆ 获奖：大连理工大学二等学习奖学金、大连理工大学优秀志愿者   |                |                             |    |

## 项目经历

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|--|---------------------------------------|
| 2020/05-2020/08  | “安卓异步类 AsyncTask 的缺陷检测”方法设计和工具实现      |
| ◆ <b>职责：</b> 提出一种“安卓异步类 AsyncTask 的缺陷”分析检测的方法，并实现自动化检测工具。工具可以检测特定编程模式导致的内存泄漏、程序崩溃等问题，可对大量真实应用进行批量检测。   |                                       |
| ◆ <b>核心技术：</b> 基于 java 语言、soot 框架、monkey 测试工具实现。工具模块包含：插桩模块、缺陷触发模块、日志收集和分类模块、执行路径提取模块、日志分析模块、结果确认模块。提出了基于日志信息提取动态执行路径的算法，该算法可以把线性的执行路径日志信息转换成树型的函数调用图。                       |                                       |
| ◆ <b>产出：</b> 工具定义了 AsyncTask 的 10 种缺陷模式，是目前对 AsyncTask 缺陷模式定义最全的工具。工具可检测开源和实际 app。该工具的结果相比其他静态分析工具减少误报，同时还能确认静态分析工具的结果。  |                                       |
| 2019/11-2020/01  | “安卓组件间通信的健壮性检测”方法设计和工具实现              |
| ◆ <b>职责：</b> 提出一种基于模糊测试的对安卓组件间通信的健壮性的检测方法，并实现自动化检测工具。  |                                       |
| ◆ <b>核心技术：</b> 基于 java 语言实现。工具模块包含：静态分析 APK 的 Manifest 文件得到组件信息、根据组件信息构造 Intent 的模糊测试用例、使用 ADB 命令向目标组件发送测试用例、使用 Logcat 和 Eventlog 检测日志信息以发现是否存在漏洞。                           |                                       |
| ◆ <b>产出：</b> 工具检测了 19 种安卓组件间通信的异常，并对不同种类的应用程序的组件间通信的异常情况进行统计。  |                                       |
| 2019/04-2019/07  | “GraphLite JanusGraph Connector”设计和实现 |
| ◆ <b>职责：</b> 为 GraphLite(基于顶点编程模型的同步图计算系统)设计接口 InputFormat 读取 JanusGraph(分布式图数据库系统)的图数据用于 GraphLite 计算。  |                                       |
| ◆ <b>核心技术：</b> 基于 C++语言实现。设计接口 InputFormat，把 GraphLite 作为 client，通过 WebSocket 和 HTTP 向 JanusGraph 的 Gremlin Server 引擎发送请求，获取 JSON 格式数据，并通过 hash partition 将大量任务划分给各个 worker。 |                                       |

## 实习经历

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|---|-----------|----------|
| 2021/01-2021/03   | 京东-京东零售部门 | 安卓客户端开发岗 |
| ◆ <b>职责：</b> 学习“京东极速版 app”的项目架构和源码；了解开发部署的基本流程。   |           |          |
| ◆ <b>收获：</b> 根据项目的业务流程图了解各模块间的交互和工作流程；阅读“任务中心”模块源码，了解具体业务实现方法；学习具体功能的设计实现、方案优化（如：安卓记录步数功能）；学习实际业务中 app 的瘦身策略； |           |          |

## 论文发表

- ◆ Chi Lin, Zihao Song, Qing Liu, Weifeng Sun, Guowei Wu. Protecting Privacy for Big Data in Body Sensor Networks: A Differential Privacy Approach. CollaborateCom 2015: 163-172. (CCF-C; 第三作者/已发表)
- ◆ Lin Q, Wu G, Liu Q. EDP: A Wireless Network Control System Energy-Efficient Real-Time Task Scheduling Algorithm[C]. BWCCA, IEEE, 2016. (第三作者/已发表)(本科毕设)

## 专业技能

- ◆ 计算机：Java 开发、soot 框架、Monkey 测试工具、Android、日志分析、hadoop 和 HBase 基本使用
- ◆ 英语：英语六级 593 分

## 实践/社团经历

- ◆ “中国软件测评中心”实习：2018 年 5 月至 2018 年 6 月实习，主要工作是设计测试用例、对外包系统进行黑盒测试
- ◆ “中公教育考研机构”辅导：2019 年 6 月任计算机专业课辅导教师，辅导数据结构、计算机网络、操作系统、体系结构
- ◆ 学生工作：国科大校学生会-实践部成员、国科大校广播站-播音员、国科大记者团-要闻部成员、班级党支部-宣传委员

# Liu Qing

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## Education

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**Chinese Academy of Sciences University, *M.S* in Software Engineering** Jan.2022 - Sept. 2018

- ◆ GPA: 3.36 Relevant Courses: Computer algorithm, Software engineering, Big Data system, Mathematical logic
- ◆ Award: Second Academic scholarship, in 2018-2019 Academic year

**Dalian University of Technology, *B.E* in Software Engineering** July.2017 - Sept. 2013

- ◆ Score: 83.21 (ranking 20%) Relevant Courses: Data structure, Database, Computer network, Operating system
- ◆ Award: Excellent volunteer, in 2015-2016 Academic year

## Academic Projects

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**Developing a Detecting Tool of ‘Defects of AsyncTask’** May. - Aug. 2020

- ◆ **Task:** Proposed a method of analysis and detection of the ‘defects of Android asynchronous’, and implemented an automatic detection tool. The tool can detect memory leaks, program crashes, etc. caused by specific programming patterns, and can detect defects in a large number of real-world applications in batch.
- ◆ **Action:** Tool modules include: instrumentation module, defect trigger module, log collection and classification module, execution path extraction module, log analysis module and result confirmation module. Proposed an algorithm for extracting dynamic execution paths based on log information converting linear execution path log information into a tree-type function call graph.
- ◆ **Result:** The tool defines ten defect patterns of AsyncTask. The tool can detect the open-source and real-world apps. Compared with other static analysis tools, the results of this tool reduce false positives, and it can confirm the correctness of the results of static analysis tools.

**Developing a Testing Tool of ‘ICC’s Robustness’** Nov.2019- Jan. 2020

- ◆ **Task:** Proposed a method for testing robustness of ICC based on fuzzing, and implemented an automatic testing tool.
- ◆ **Action:** Tool modules include: static analysis of APK Manifest files to obtain component information, construction of intent fuzzing test cases, send test cases to target components, use of Logcat to detect log information.
- ◆ **Result:** The tool can detect 19 kinds of abnormal communications between Android components.

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**Development of ‘GraphLite - JanusGraph Connector’** Apr. - July. 2019

- ◆ **Task:** Designed interface ‘InputFormat’ for GraphLite (asynchronous graph computing system based on vertex programming model) to read graph data of JanusGraph (distributed graph database system) for GraphLite computing.
- ◆ **Action:** Take GraphLite as a client and send the request to Gremlin Server engine of JanusGraph through WebSocket and HTTP, obtain JSON format data, and divide many tasks to each worker through the hash partition.

## Working Experience

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**JD.com, Android Development Engineer** Jan. - Mar. 2021

- ◆ **Task:** Learned the project architecture and source code of the "Extreme version of JD app"; understood the process of development and deployment.
- ◆ **Result:** Understood the interaction and workflow between the modules according to the business flow chart of the project; read the source code of the "Task Center" module to understand the specific business implementation methods; learned the slimming strategy of apps in actual business;

## Paper

- ◆ Chi Lin, Zihao Song, Qing Liu, Weifeng Sun, Guowei Wu. Protecting Privacy for Big Data in Body Sensor Networks: A Differential Privacy Approach. CollaborateCom 2015: 163-172.
- ◆ Lin Q, Wu G, Liu Q. EDP: A Wireless Network Control System Energy-Efficient Real-Time Task Scheduling Algorithm[C]. BWCCA, IEEE, 2016.

## Technical Skills

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- ◆ Technical Skills: Java, Soot frame, Monkey tool, Android development, Log analysis, Hadoop, HBase.