Jingbo **Lu**

Postdoctoral Fellow

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Experience

2020 - present Sydney, Australia	**Research Associate** University of New South Wales (UNSW) supervisor : Prof. Jingling Xue

Education

2016 - 2020 Sydney, Australia	**Ph.D. in Computer Science and Engineering** University of New South Wales (UNSW) Advisor(s) : Prof. Jingling Xue and Assoc. Prof. Yulei Sui
2014 - 2016 Sydney, Australia	**M.Eng in Information Technology** University of New South Wales (UNSW)
2009 - 2013 Tianjin, China	**B.Sc in Applied Physics** Nankai University (NKU) Advisor(s) : Prof. Xinyu Wang

Research Interests

My areas of interest are compilers and programming languages. In particular, my current research focuses on static program analysis. I have great interest in developing fundamental static and dynamic program analysis techniques and tools to improve the usability, reliability and security of complicated software systems.

Projects

Dec 2020 - Aug 2021

Qilin, Fine-Grained Context- Sensitive Pointer Analysis Framework for Java

Java Python XML

Description & Outcome : Qilin is a generalized (modern) alternative to support the current research trend on exploring fine-grained context-sensitivity (where different variables/objects in a method can be analyzed under (i.e., qualified by) different context abstractions at the variable level), precisely, efficiently, and modularly. To meet these four design goals, Qilin is developed as an imperative framework consisting of a fine-grained pointer analysis kernel with parameterized context-sensitivity that supports on-the-fly call graph construction and exception analysis, solved iteratively based on a carefully-crafted incremental worklist-based constraint solver, on top of its handlers for complex Java features.

Features & Contribution :

- integrates a collection of various context-sensitive analyses
- fine-grained context-sensitivity supported
- both stand-alone (for end user) and extensible (for developer)
- compatible with mainstream platforms

Dec 2016 - Aug 2018 | **DRUID**, a Java and Android analysis framework

Java | Python | XML

Description & Outcome : DRUID is a pointer analysis framework that integrates a wide range of mainstream context sensitive technologies. It combines the advantages of the major mainstream platforms in the past, and redesigns the control process for context-sensitive pointer analysis needs. Its usability and extendibility have been greatly improved.

Features & Contribution :

- integrates a collection of various context-sensitive analyses
- Java byte-code and Android apk supported
- both stand-alone (for end user) and extensible (for developer)
- compatible with mainstream platforms
- existing client(s) based on it : alias analysis, call-graph construction, null-pointer detection, safe-cast detection

PUBLICATIONS

2022 Dongjie He, **Jingbo Lu**, Yaoqing Gao and Jingling Xue. Selecting Context-Sensitivity Modularly for Accelerating Object-Sensitive Pointer Analysis. In IEEE Transactions on Software Engineering (TSE'22), 2022.

2022 Dongjie He, **Jingbo Lu** and Jingling Xue. Qilin : A New Framework for Supporting Fine-Grained Context-Sensitivity in Java Pointer Analysis. In 36th European Conference on Object-Oriented Programming (ECOOP'22), 2022.

2021 Dongjie He, **Jingbo Lu** and Jingling Xue. Context Debloating for Object-Sensitive Pointer Analysis. In 36th IEEE/ACM International Conference on Automated Software Engineering (ASE'21), pages 79 – 91, 2021.

2021 **Jingbo Lu**, Dongjie He and Jingling Xue. Selective Context-Sensitivity for k-CFA with CFL-Reachability. In 28th International Static Analysis Symposium (SAS'21), pages 261 – 285, 2021.

2021 Dongjie He, **Jingbo Lu**, Yaoqing Gao, and Jingling Xue. Accelerating Object-Sensitive Pointer Analysis by Exploiting Object Containment and Reachability. In 35th European Conference on Object-Oriented Programming (ECOOP'21), LIPIcs, Vol. 194, pp. 16 :1 – 16 :31, 2021.

2021 **Jingbo Lu**, Dongjie He and Jingling Xue. Eagle : CFL-Reachability-based Precision-Preserving Acceleration of Object-Sensitive Pointer Analysis with Partial Context Sensitivity. In 2019 ACM Transactions on Software Engineering and Methodology (TOSEM'21), 30(4), 2021.

2019 **Jingbo Lu** and Jingling Xue. Precision-Preserving Yet Fast Object-Sensitive Pointer Analysis with Partial Context Sensitivity. In 2019 ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'19), pages 148 :1 – 148 :29, Athens, 2019.

ACADEMIC SERVICES

External Review Committee | OOPSLA'22

Artifact Evaluation Committee | OOPSLA'22

References

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