

Jihyeok Park (박지혁)

ASSISTANT PROFESSOR

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Research Interests

The ultimate goal is to help developers design and implement high-quality software using diverse programming language techniques:

- **program analysis** for automatically understanding program behaviors and detecting software bugs and vulnerabilities.
- **mechanized specification** to fill the gap between human-readable specifications and machine-friendly software.
- **program synthesis** to lessen the burden of software development by automatically generating programs.
- **automated testing** to generate test cases for software automatically on behalf of humans.

Education

Integrated M.S. & Ph.D in School of Computing

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

- Ph.D. Thesis - JavaScript Static Analysis for Evolving Language Specifications
- Programming Language Research Group
- Advisor: Sukyoung Ryu

Daejeon, Republic of Korea

Mar. 2016 - Feb. 2022

B.S in School of Computing and Mathematical Science

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

Daejeon, Republic of Korea

Mar. 2012 - Feb. 2016

Work Experience

Mar. 2023 - PRESENT **Assistant Professor**, Korea University

Seoul, Republic of Korea

Feb. 2022 - Feb. 2022 **Post Doctoral Fellow**, Oracle Labs

Brisbane, Australia

Publications

Automatically Deriving JavaScript Static Analyzers from Specifications using Meta-Level Static Analysis

JHYEOK PARK, SEUNGMIN AN, AND SUKYOUNG RYU

PROCEEDINGS OF THE 30TH ACM JOINT EUROPEAN SOFTWARE ENGINEERING CONFERENCE AND SYMPOSIUM ON THE FOUNDATIONS OF SOFTWARE ENGINEERING (ESEC/FSE)

Nov. 2022

Filling the Gap between the JavaScript Language Specification and Tools using the JISET Family

SUKYOUNG RYU, JHYEOK PARK, AND SEUNGMIN AN

PROCEEDINGS OF THE 43RD ACM SIGPLAN CONFERENCE ON PROGRAMMING LANGUAGE DESIGN AND IMPLEMENTATION (PLDI) TUTORIAL

Jun. 2022

JSTAR: JavaScript Specification Type Analyzer using Refinement

JHYEOK PARK, SEUNGMIN AN, WONHO SHIN, YUSUNG SIM, AND SUKYOUNG RYU

PROCEEDINGS OF THE 36TH IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE)

Nov. 2021

Accelerating JavaScript Static Analysis via Dynamic Shortcuts

JOONYOUNG PARK*, JHYEOK PARK*, DONGJUN YOUN, AND SUKYOUNG RYU (*EQUALLY CONTRIBUTED)

PROCEEDINGS OF THE 29TH ACM JOINT EUROPEAN SOFTWARE ENGINEERING CONFERENCE AND SYMPOSIUM ON THE FOUNDATIONS OF SOFTWARE ENGINEERING (ESEC/FSE)

Aug. 2021

JavaScript Static Analysis with Evolving Engines and Specification

JIHYEOK PARK

PROCEEDINGS OF THE 35TH EUROPEAN CONFERENCE ON OBJECT-ORIENTED PROGRAMMING AND PROCEEDINGS OF THE 30TH ACM SIGSOFT INTERNATIONAL SYMPOSIUM ON SOFTWARE TESTING AND ANALYSIS DOCTORAL SYMPOSIUM TRACK (ECOOP/ISSTA DS)

Jul. 2021

A Survey of Parametric Static Analysis

JIHYEOK PARK*, HONGKI LEE*, AND SUKYOUNG RYU (*EQUALLY CONTRIBUTED)

ACM COMPUTING SURVEYS (CSUR), VOLUME 54, ISSUE 7, ARTICLE NO. 149, PP 1–37

Jul. 2021

JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification

JIHYEOK PARK, SEUNGMIN AN, DONGJUN YOUN, GYEONGWON KIM, AND SUKYOUNG RYU

PROCEEDINGS OF THE 43RD ACM/IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE)

May 2021

ACM SIGSOFT DISTINGUISHED PAPER AWARD

JISET: JavaScript IR-based Semantics Extraction Toolchain

JIHYEOK PARK, JIHEE PARK, SEUNGMIN AN, AND SUKYOUNG RYU

PROCEEDINGS OF THE 35TH IEEE/ACM INTERNATIONAL CONFERENCE ON AUTOMATED SOFTWARE ENGINEERING (ASE)

Sep. 2020

Towards Analysis and Bug Finding of JavaScript Web Applications in the Wild

SUKYOUNG RYU, **JIHYEOK PARK**, AND JOONYOUNG PARK

IEEE SOFTWARE, VOLUME 36, ISSUE 3, PP 74–82

Jun. 2019

Path Dependent Types with Path-Equality

JAEMIN HONG, **JIHYEOK PARK**, AND SUKYOUNG RYU

PROCEEDINGS OF THE 9TH ACM SIGPLAN SYMPOSIUM ON SCALA

Sep. 2018

A Framework for Dynamic Inter-Device Task Dispatch with Eventual Consistency

JIHYEOK PARK, JOONYOUNG PARK, YOONKYONG LEE, CHUL-JOO KIM, BYOUNGOH KIM, AND SUKYOUNG RYU

PROCEEDINGS OF THE 2ND INTERNATIONAL WORKSHOP ON PROGRAMMING TECHNOLOGY FOR THE FUTURE WEB (ProWeb)

Apr. 2018

Toward Building Memory-safe Network Functions with Modest Performance Overhead

KEUNHONG LEE, SHINAE WOO, SANGHYEON SEO, **JIHYEOK PARK**, SUKYOUNG RYU, AND SUE MOON

PROCEEDINGS OF THE 3RD SIGCOMM WORKSHOP ON NETWORKING AND PROGRAMMING LANGUAGES (NETPL '17)

Aug. 2017

Revisiting Recency Abstraction for JavaScript: Towards an Intuitive, Compositional, and Efficient Heap Abstraction

JIHYEOK PARK, XAVIER RIVAL AND SUKYOUNG RYU

PROCEEDINGS OF THE INTERNATIONAL WORKSHOP ON THE STATE OF THE ART IN JAVA PROGRAM ANALYSIS (SOAP)

Jun. 2017

BEST PAPER AWARD

Analysis of JavaScript Web Applications Using SAFE 2.0

JIHYEOK PARK, YEONHEE RYU, JOONYOUNG PARK, AND SUKYOUNG RYU

PROCEEDINGS OF THE 39TH INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE) DEMONSTRATIONS TRACK

May 2017

JavaScript API Misuse Detection by Using TypeScript

JIHYEOK PARK

PROCEEDINGS OF THE 13TH INTERNATIONAL CONFERENCE ON MODULARITY

Apr. 2014

ACM STUDENT RESEARCH COMPETITION 3RD

Honors & Awards

Mar. 2022 **Ph.D. Dissertation Award**, College of Engineering, KAIST

Daejeon, Republic of Korea

Feb. 2022	An Outstanding Ph.D. Thesis , School of Computing, KAIST	Daejeon, Republic of Korea
May 2021	ACM SIGSOFT Distinguished Paper Award , ICSE 2021	Madrid, Spain
Dec. 2020	PhD Fellowship Award , NAVER Corp.	Daejeon, Republic of Korea
Sep. 2019	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS320)	Daejeon, Republic of Korea
Feb. 2019	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS320)	Daejeon, Republic of Korea
Aug. 2018	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS320)	Daejeon, Republic of Korea
Aug. 2017	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS320)	Daejeon, Republic of Korea
Jun. 2017	Best Paper , International Workshop on the State Of the Art in Java Program Analysis (SOAP)	Barcelona, Spain
Feb. 2017	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS320)	Daejeon, Republic of Korea
Sep. 2016	Outstanding Teaching Assistant Award , School of Computing, KAIST (CS109)	Daejeon, Republic of Korea
Feb. 2016	Magna Cum Laude (GPA: 3.88/4.3) , School of Computing, KAIST	Daejeon, Republic of Korea
Sep. 2014	Workshop 3rd Award , URP Program, KAIST	Daejeon, Republic of Korea
Apr. 2014	ACM Student Research Competition 3rd , International Conference on Modularity 2014	Lugano, Swiss
Mar. 2014	Honor Program , School of Computing, KAIST	Daejeon, Republic of Korea
Jul. 2013	KAIST Presidential Fellowship , School of Computing, KAIST	Daejeon, Republic of Korea

Teaching

TEACHER

2023 Spring	COSE 215: Theory of Computation , Korea University	Seoul, Republic of Korea
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TEACHING ASSISTANT

2019 Fall	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2019 Spring	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2018 Fall	CS408: Computer Science Project course , KAIST	Daejeon, Republic of Korea
2018 Fall	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2018 Spring	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2017 Fall	CS492: Special Topics in Computer Science <Program Analysis> , KAIST	Daejeon, Republic of Korea
2017 Fall	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2017 Spring	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2016 Fall	CS320: Programming Languages course , KAIST	Daejeon, Republic of Korea
2016 Spring	CS109: Programming Practice course , KAIST	Daejeon, Republic of Korea

Talks

CONFERENCE & WORKSHOP PRESENTATION

Nov. 2021	ASE 2021 , JSTAR: JavaScript Specification Type Analyzer using Refinement	Online
Jul. 2021	Doctoral Symposium Track of ECOOP/ISSTA 2021 , JavaScript Static Analysis with Evolving Engines and Specification	Online
May 2021	ICSE 2021 , JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification	Online
Sep. 2020	ASE 2020 , JISET: JavaScript IR-based Semantics Extraction Toolchain	Online
Sep. 2018	Journal First Presentation at ICSME 2018 , Towards Analysis and Bug Finding of JavaScript Web Applications in the Wild	Cleveland, USA
Apr. 2018	ProWeb 2018 , A Framework for Dynamic Inter-Device Task Dispatch with Eventual Consistency	Nice, France
Jun. 2017	SOAP 2017 , Revisiting Recency Abstraction for JavaScript: Towards an Intuitive, Compositional, and Efficient Heap Abstraction	Barcelona, Spain
May 2017	Demonstrations Trak of ICSE 2017 , Analysis of JavaScript Web Applications Using SAFE 2.0.	Buenos Aires, Argentina
Apr. 2014	Student Research Competition at Modularity 2014 , JavaScript API Misuse Detection by Using TypeScript	Lugano, Switzerland

INVITED TALKS

Mar. 2023	CS Colloquium at Korea University , 기계화 명세를 이용한 자바스크립트 언어의 설계와 구현	Seoul, Republic of Korea
Jan. 2023	KCSE 2023 , Automatically Deriving JavaScript Static Analyzers from Specifications using Meta-Level Static Analysis	Pyeongchang, Republic of Korea

Dec. 2022	KSC 2022 , Automatically Deriving JavaScript Static Analyzers from Specifications using Meta-Level Static Analysis	Jeju, Republic of Korea
Feb. 2022	SIGPL Winter School 2022 , JavaScript Static Analysis for Evolving Language Specifications	Online
Feb. 2022	STAAR Workshop , JavaScript Static Analysis for Evolving Language Specifications	Online
Jan. 2022	The 88th meeting of Ecma TC39 , JavaScript Static Analysis for Evolving Language Specifications	Online
Jan. 2022	KCSE 2022 , JSTAR: JavaScript Specification Type Analyzer using Refinement	Online
Jan. 2022	KCSE 2022 , JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification	Online
Jan. 2022	Agoric , JavaScript Static Analysis for Evolving Language Specifications	Online
Dec. 2021	KSC 2021 , JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification	Online
Dec. 2021	Département d'Informatique de l'École Normale Supérieure , JavaScript Static Analysis for Evolving Language Specifications	Online
Oct. 2021	EIRIC , JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification	Online
Sep. 2021	KAISTPL Workshop 2021 , JavaScript Static Analysis for Evolving Language Specifications	Online
Jun. 2021	KAIST Prosys Lab , Towards Co-evolution of JavaScript Specification and Tools	Daejeon, Republic of Korea
Jun. 2021	KCC 2021 , JISET: JavaScript IR-based Semantics Extraction Toolchain	Jeju, Republic of Korea
Nov. 2019	National University of Singapore , Update-Tolerant JavaScript Static Analysis for Frequently Released ECMAScript	Singapore

Software

ESMeta: ECMAScript Specification (ECMA-262) Metalanguage

PROGRAMMING LANGUAGE RESEARCH GROUP, KAIST

Jan. 2022 - PRESENT

- Main developer of ESMeta
- Developed in Scala
- URL: <https://github.com/es-meta/esmeta>

SAFE: Scalable Analysis Framework for ECMAScript

PROGRAMMING LANGUAGE RESEARCH GROUP, KAIST

Mar. 2016 - PRESENT

- Main developer of SAFE version 2.0
- Developed in Scala
- URL: <https://github.com/sukyoung/safe>

Activities

PROGRAM COMMITTEE (PC) MEMBERS

Apr. 2024	ICSE 2024 , Program Committee (PC) Member	Lisbon, Portugal
Dec. 2023	OOPSLA 2023 , Extended Review Committee (ERC) Member	Lisbon, Portugal
Nov. 2023	APLAS 2023 , Program Committee (PC) Member	Taipei, Taiwan
Dec. 2022	OOPSLA 2022 , Extended Review Committee (ERC) Member	Auckland, New Zealand
Dec. 2022	APLAS 2022 , Program Committee (PC) Member	Auckland, New Zealand

ARTIFACT EVALUATION COMMITTEE (AEC) MEMBERS

Dec. 2023	OOPSLA 2023 , Artifact Evaluation Committee (AEC) Member	Lisbon, Portugal
Dec. 2022	OOPSLA 2022 , Artifact Evaluation Committee (AEC) Member	Auckland, New Zealand
Oct. 2019	POPL 2019 , Artifact Evaluation Committee (AEC) Member	Louisiana, United States
Jul. 2019	OOPSLA 2019 , Artifact Evaluation Committee (AEC) Member	Athens, Greece
Jul. 2018	OOPSLA 2018 , Artifact Evaluation Committee (AEC) Member	Massachusetts, United States
Jun. 2018	SAS 2018 , Artifact Evaluation Committee (AEC) Member	Freiburg im Breisgau, Germany
May. 2018	ISSTA 2018 , Artifact Evaluation Committee (AEC) Member	Amsterdam, Netherlands

OTHERS

Jul. 2022	ISSTA 2022 , Web Co-Chair	Daejeon, South Korea
Sep. 2015 - Feb. 2019	Samsung Electronics , Reviewer for C++ Code Reviewing Exams	Daejeon, S.Korea
Jul. 2018	École normale supérieure , Internship Program (Professor: Xavier Rival)	Paris, France
Sep. 2017	NII Shonan Meeting , Topic: Memory Abstraction, Emerging Techniques and Applications	Shonan, Japan
Feb. 2015 - Jun. 2015	INSA de Toulouse , Exchange Student Program	Toulouse, France

Jun. 2014 - Nov. 2014
Dec. 2013 - Jun. 2014

KOFAC, Undergraduate Research Program (URP) for Fusion of Creatives
School of Computing, KAIST, Undergraduate Research Project (URP) Program

Daejeon, S.Korea
Daejeon, S.Korea