Jihyeok **Park** (박지혁)

Post Doctoral Fellow at Oracle Labs Australia

(+82) 10-4126-8418 | jihyeok.park@oracle.com | jhpjhp0223@gmail.com | park.jihyeok.site | jhnaldo | jhnaldo

Education

Integrated M.S. & Ph.D in School of Computing *Daejeon, S.Korea*

Korea Advanced Institue of Science and Technology *Mar. 2016 - Feb. 2022*

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

B.S in School of Computing and Mathematical Science *Daejeon, S.Korea*

Korea Advanced Institue of Science and Technology *Mar. 2012 - Feb. 2016*

Research Interests

Mechanized Specification, JavaScript Static/Dynamic/Hybrid Analysis, Program Synthesis, Automated Software Testing / Fuzzing, and Parsing Expression Grammar (PEG)

Work Experience

Oracle Labs *Brisbane, Australia*

Post Doctoral Fellow *Feb. 2022 - PRESENT*

- Designing a security scanner to detect vulnabilties in JavaScript client-side applications propagated from disclosed vulnabilties (i.e., CVEs).

Publications

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

Jihyeok Park, Seungmin An, and Sukyoung Ryu

Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the *Nov. 2022*
Foundations of Software Engineering (ESEC/FSE)

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

Sukyoung Ryu, Jihyeok Park, and Seungmin An

Proceedings of the 43rd ACM SIGPLAN Conference on Programming Language Design and Implementation *Jun. 2022*
(PLDI) Tutorial

JSTAR: JavaScript Specification Type Analyzer using Refinement

Jihyeok 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*, Jihyeok Park*, Dongjun Youn, and Sukyoung Ryu (*equally contributed)

Proceedings of the 29th ACM Joint European Software Engineering Conference and Symposium on the *Aug. 2021*
Foundations of Software Engineering (ESEC/FSE)

JavaScript Static Analysis with Evolving Engines and Specification

Jihyeok Park

Proceedings of the 35th European Conference on Object-Oriented Programming and Proceedings of the *Jul. 2021*
30th ACM SIGSOFT International Symposium on Software Testing and Analysis Doctoral Symposium track
(ECOOP/ISSTA DS)

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 Ryou, 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**, KAIST College of Engineering *Daejeon*, *S.Korea*
Feb. 2022 **An Outstanding Ph.D. Thesis**, KAIST School of Computing *Daejeon*, *S.Korea*
May 2021 **ACM SIGSOFT Distinguished Paper Award**, International Conference on Software Engineering (ICSE) *Madrid*, *Spain*
Dec. 2020 **PhD Fellowship Award**, NAVER Corp. *Daejeon*, *S.Korea*
Sep. 2019 **Outstanding Teaching Assistant Award**, KAIST CS320 Programming Languages course *Daejeon*, *S.Korea*
Feb. 2019 **Outstanding Teaching Assistant Award**, KAIST CS320 Programming Languages course *Daejeon*, *S.Korea*
Aug. 2018 **Outstanding Teaching Assistant Award**, KAIST CS320 Programming Languages course *Daejeon*, *S.Korea*
Aug. 2017 **Outstanding Teaching Assistant Award**, KAIST CS320 Programming Languages course *Daejeon*, *S.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**, KAIST CS320 Programming Languages course *Daejeon*, *S.Korea*
Sep. 2016 **Outstanding Teaching Assistant Award**, KAIST CS109 Programming Practice course *Daejeon*, *S.Korea*
Feb. 2016 **Magna Cum Laude (GPA: 3.88/4.3)**, School of Computing, KAIST *Daejeon*, *S.Korea*
Sep. 2014 **Workshop 3rd Award**, Undergraduate Research Project (URP) Program, KAIST *Daejeon*, *S.Korea*
Apr. 2014 **ACM Student Research Competition 3rd**, International Conference on Modularity *Lugano*, *Swiss*
Mar. 2014 **Honor Program**, School of Computing, KAIST *Daejeon*, *S.Korea*
Jul. 2013 **KAIST Presidential Fellowship**, School of Computing, KAIST *Daejeon*, *S.Korea*

Teaching

2019 Fall **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2019 Spring **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2018 Fall **KAIST CS408 Computer Science Project course**, Teaching Assistant *Daejeon*, *S.Korea*
2018 Fall **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2018 Spring **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2017 Fall **KAIST CS492 Special Topics in Computer Science <Program Analysis>**, Teaching Assistant *Daejeon*, *S.Korea*
2017 Fall **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2017 Spring **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2016 Fall **KAIST CS320 Programming Languages course**, Teaching Assistant *Daejeon*, *S.Korea*
2016 Spring **KAIST CS109 Programming Practice course**, Teaching Assistant *Daejeon*, *S.Korea*
2014 Summer **Basic Computer Science Course, KAIST YOUTH Scientist Summer Camp**, Teacher *Daejeon*, *S.Korea*
2013 Summer **Basic Computer Science Course, KAIST YOUTH Scientist Summer Camp**, Teacher *Daejeon*, *S.Korea*

Talks

Seminar at Korea Software Congress (KSC) 2022 *Jeju*, *South Korea*
Presenter for <Automatically Deriving JavaScript Static Analyzers from Specifications using Meta-Level Static Analysis> *Dec. 2022*

Invited Talk at SIGPL Winter School 2022 *Online*
Presenter for <JavaScript Static Analysis for Evolving Language Specifications> *Feb. 2022*

Invited Talk at Software Disaster Research Center Agile & Automated Response & Repair (STAAR) Workshop *Online*
Presenter for <JavaScript Static Analysis for Evolving Language Specifications> *Feb. 2022*

Invited Talk at the 88th meeting of Ecma TC39 *Online*
Presenter for <JavaScript Static Analysis for Evolving Language Specifications> *Jan. 2022*

Seminar at The 24th Korea Conference On Software Engineering (KCSE 2022) *Online*
Presenter for <JSTAR: JavaScript Specification Type Analyzer using Refinement> *Jan. 2022*

Seminar at The 24th Korea Conference On Software Engineering (KCSE 2022) *Online*
Presenter for <JEST: N+1-version Differential Testing of Both JavaScript Engines and Specification> *Jan. 2022*

Invited Talk at Agoric
PRESENTER for <JAVASCRIPT STATIC ANALYSIS FOR EVOLVING LANGUAGE SPECIFICATIONS>

Online

Jan. 2022

Seminar at Korea Software Congress (KSC) 2021
PRESENTER for <JEST: N+1-VERSION DIFFERENTIAL TESTING OF BOTH JAVASCRIPT ENGINES AND SPECIFICATION>

Online

Dec. 2021

Seminar at le Département d'Informatique de l'École Normale Supérieure (DIENS)
PRESENTER for <JAVASCRIPT STATIC ANALYSIS FOR EVOLVING LANGUAGE SPECIFICATIONS>

Online

Dec. 2021

The 36th IEEE/ACM International Conference on Automated Software Engineering (ASE 2021)
PRESENTER for <JSTAR: JAVASCRIPT SPECIFICATION TYPE ANALYZER USING REFINEMENT>

Online

Nov. 2021

Seminar at Electronic & Information Research Information Center (EIRIC)
PRESENTER for <JEST: N+1-VERSION DIFFERENTIAL TESTING OF BOTH JAVASCRIPT ENGINES AND SPECIFICATION>

Online

Oct. 2021

KAISTPL Workshop 2021
PRESENTER for <JAVASCRIPT STATIC ANALYSIS FOR EVOLVING LANGUAGE SPECIFICATIONS>

Online

Sep. 2021

Doctoral Symposium Track of ECOOP/ISSTA 2021
PRESENTER for <JAVASCRIPT STATIC ANALYSIS WITH EVOLVING ENGINES AND SPECIFICATION>

Online

Jul. 2021

Lab Seminar at KAIST Programming Systems Laboratory (Prosys Lab)
PRESENTER for <TOWARDS CO-EVOLUTION OF JAVASCRIPT SPECIFICATION AND TOOLS>

Daejeon, South Korea

Jun. 2021

Invite Talk at Korea Computer Congress (KCC) 2021
PRESENTER for <JISET: JAVASCRIPT IR-BASED SEMANTICS EXTRACTION TOOLCHAIN>

Jeju, South Korea

Jun. 2021

The 43rd ACM/IEEE International Conference on Software Engineering (ICSE 2021)
PRESENTER for <JEST: N+1-VERSION DIFFERENTIAL TESTING OF BOTH JAVASCRIPT ENGINES AND SPECIFICATION>

Online

May 2021

The 35th IEEE/ACM International Conference on Automated Software Engineering (ASE 2020)
PRESENTER for <JISET: JAVASCRIPT IR-BASED SEMANTICS EXTRACTION TOOLCHAIN>

Online

Sep. 2020

Invite Talk at National University of Singapore (NUS)
PRESENTER for <UPDATE-TOLERANT JAVASCRIPT STATIC ANALYSIS FOR FREQUENTLY RELEASED ECMASCRIPT>

Singapore

Nov. 2019

Journal First Presentation at the 34th IEEE International Conference on Software Maintenance and Evolution (ICSME 2018 J1C2)
PRESENTER for <TOWARDS ANALYSIS AND BUG FINDING OF JAVASCRIPT WEB APPLICATIONS IN THE WILD>

Cleveland, USA

Sep. 2018

The 2nd International Workshop on Programming Technology for the Future Web (ProWeb 2018)
PRESENTER for <A FRAMEWORK FOR DYNAMIC INTER-DEVICE TASK DISPATCH WITH EVENTUAL CONSISTENCY>

Nice, France

Apr. 2018

The 6th ACM SIGPLAN International Workshop on the State Of the Art in Java Program Analysis (SOAP 2017)
PRESENTER for <REVISITING RECENCY ABSTRACTION FOR JAVASCRIPT: TOWARDS AN INTUITIVE, COMPOSITIONAL, AND EFFICIENT HEAP ABSTRACTION>

Barcelona, Spain

Jun. 2017

Demonstrations Trak of the 39th International Conference on Software Engineering (ICSE-C 2017)

PRESENTER FOR <ANALYSIS OF JAVASCRIPT WEB APPLICATIONS USING SAFE 2.0.>

Buenos Aires, Argentina

May 2017

Student Research Competition at the 13th International Conference on Modularity (Modularity 2014 SRC)

PRESENTER FOR <JAVASCRIPT API MISUSE DETECTION BY USING TYPESCRIPT>

Lugano, Switzerland

Apr. 2014

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) Member

ACM/IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE)

Lisbon, Portugal

Apr. 2024

Extended Review and Artifact Evaluation Committee (ERC+AEC) Member

ACM CONFERENCE ON OBJECT-ORIENTED PROGRAMMING, SYSTEMS, LANGUAGES, AND APPLICATIONS (OOPSLA)

Lisbon, Portugal

Dec. 2023

Extended Review and Artifact Evaluation Committee (ERC+AEC) Member

ACM CONFERENCE ON OBJECT-ORIENTED PROGRAMMING, SYSTEMS, LANGUAGES, AND APPLICATIONS (OOPSLA)

Auckland, New Zealand

Dec. 2022

Program Committee (PC) Member

THE 19TH ASIAN SYMPOSIUM ON PROGRAMMING LANGUAGES AND SYSTEMS (APLAS)

Auckland, New Zealand

Dec. 2022

Web Co-Chair

THE 31ST ACM SIGSOFT INTERNATIONAL SYMPOSIUM ON SOFTWARE TESTING AND ANALYSIS (ISSTA)

Daejeon, South Korea

Jul. 2022

Artifact Evaluation Committee (AEC) Member

THE 47TH ACM SIGPLAN SYMPOSIUM ON PRINCIPLES OF PROGRAMMING LANGUAGES (POPL)

Louisiana, United States

Oct. 2019

Artifact Evaluation Committee (AEC) Member

ACM CONFERENCE ON OBJECT-ORIENTED PROGRAMMING, SYSTEMS, LANGUAGES, AND APPLICATIONS (OOPSLA)

Athens, Greece

Jul. 2019

Reviewer for C++ Code Reviewing Exams

SAMSUNG ELECTRONICS

Daejeon, S.Korea

Sep. 2015 - Feb. 2019

Journal First Presentation

IEEE INTERNATIONAL CONFERENCE ON SOFTWARE MAINTENANCE AND EVOLUTION (ICSME)

Madrid, Spain

Sep. 2018

- Session: Program Analysis - II
- Title: Towards Analysis and Bug Finding of JavaScript Web Applications in the Wild

Artifact Evaluation Committee (AEC) Member

ACM CONFERENCE ON OBJECT-ORIENTED PROGRAMMING, SYSTEMS, LANGUAGES, AND APPLICATIONS (OOPSLA)

Massachusetts, United States

Jul. 2018

Internship Program *Paris, France*

École normale supérieure *Jul. 2018*

- Professor: Xavier Rival
- Subject: Allocation Call-site Abstraction with K-limiting Approach (k-ACS)

Artifact Evaluation Committee (AEC) Member *Freiburg im Breisgau, Germany*

Static Analysis Symposium (SAS) *Jun. 2018*

Artifact Evaluation Committee (AEC) Member *Amsterdam, Netherlands*

ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA) *May. 2018*

Shonan Meeting *Shonan, Japan*

National Institute of Informatics (NII) *Sep. 2017*

- Topic: Memory Abstraction, Emerging Techniques and Applications
- Presentation: Revisiting Recency Abstraction for JavaScript: Towards an Intuitive, Compositional, and Efficient Heap Abstraction

Exchange Student Program *Toulouse, France*

Informatique et Réseaux, Institut National des Sciences Appliquées de Toulouse *Feb. 2015 - Jun. 2015*

Undergraduate Research Program for Fusion of Creatives *Daejeon, S.Korea*

Korea Foundation for the Advancement of Science and Creativity (KOFAC) *Jun. 2014 - Nov. 2014*

- Topic: Design of Flexible Tactile Display Creating Multiple Steps of Touch Feeling
- Advisor: Sukyoung Ryu

Undergraduate Research Project (URP) Program *Daejeon, S.Korea*

School of Computing, KAIST *Dec. 2013 - Jun. 2014*

- Topic: JavaScript API Misuse Detection by Using TypeScript
- Advisor: Sukyoung Ryu