Prof. Kwangkeun Yi

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Current Position
> Professor, Department of Computer Science and Engineering
> Seoul National University

Education
- 1993: Ph.D. (Computer Science)   Univ. of Illinois at Urbana-Champaign
- 1987: B.S. (Computer Science & Statistics)   Seoul National University

Experience
- 2007 – present: Full Professor, Seoul National University
- 2003 – 2007: Associate Professor, Seoul National University
- 2001 – 2003: Associate Professor, Korea Advanced Institute of Science & Technology
- 1995 – 2001: Assistant Professor, Korea Advanced Institute of Science & Technology

- 9/2017 – 1/2019: Vice Dean, Planning & Strategy, College of Engineering, Seoul National University
- 9/2008 – 3/2016: Director, ROSAEC Center (Research On Software Analysis for Error-free Computing), Engineering Research Center of Excellence, Korea Science & Engineering Foundation
- 9/1998 – 7/2003: Director, ROPAS Center (Research On Program Analysis System), National Creative Research Initiative Center, Korea Science & Engineering Foundation
- 1993 – 1995: Member of Technical Staff(regular), Software Principles Research Department, Bell Labs., Murray Hill, New Jersey, U.S.A.

- 1/2017 – 2/2017: Visiting Professor, Computer Science Department, Stanford University (host: Prof. Alex Aiken)
- 11/2016 – 12/2016: Research Scientist, Facebook, London, UK (host: Dr. Peter O'Hearn)
- 7/2016 – 10/2016: Visiting Professor, Computer Science Department, École Normale Supérieure, Paris, France (host: Prof. Xavier Rival)
- 4/2012 – 6/2012: Visiting Professor, Laboratory for Computer Science & Artificial Intelligence, M.I.T., Cambridge, U.S.A. (host: Prof. Arvind and Prof. Martin Rinard)
- 4/2008 – 7/2008: Visiting Professor, Laboratory for Computer Science & Artificial Intelligence, M.I.T., Cambridge, U.S.A. (host: Prof. Martin Rinard)
- 1/2008 – 4/2008: Visiting Professor, Computer Science Department, Carnegie-Mellon University, Pittsburgh, U.S.A. (host: Prof. Edmund Clarke)
- 7/2002 – 8/2002: Visiting Professor, Computer Science Department, École Normale Supérieure, Paris, France (host: Prof. Patrick Cousot)
- 7/1998 – 8/1998: Visiting Research Consultant, Software Principles Research Department, Bell Labs., Murray Hill, New Jersey, U.S.A.

Researches	semantics-based program analysis static analysis programming language theory higher-order and typed programming language system programming systems application of static analysis technology

Books

- *Introduction to Static Analysis: an Abstract Interpretation Perspectives*, Xavier Rival and Kwangkeun Yi (names in alphabetical order), MIT Press, 2020.

- *Computer Gwahak e Yeoneun Sege*, Kwangkeun Yi, Insight, 2015 (in Korean). (Title in English: "The World of Computer Science")

Softwares

- Sparrow: an industrialized static analyzer for static detection of memory errors in C and C++ program sources. It shows superior performance edges against existing competitors in the market. (`http://ropas.snu.ac.kr/sparrow`)

- ZooBerry: a software framework that fills the gap between static analysis designs (abstract semantics and their soundness proofs) and their faithful yet scalable implementation (global analyzers whose analysis results can be automatically checked correct). (`http://ropas.snu.ac.kr/zooberry`).

- nML Programming Language System: a dialect of ML (`http://ropas.snu.ac.kr/n`). Its compiler system has been used in SNU's and KAIST's programming language classes since Spring 2000. The Airac analyzer has been implemented in nML.

- SML Exception Analyzer: a static analyzer for detecting may-uncaught exceptions in Standard ML programs. This analyzer has been embedded in the SML/NJ 110 compiler system and released August 1998.

- System Z1, Z2, and Zoo: static program analyzer generator that builds semantic-based static program analyzers from very high-level specifications.

Talks

- Keynote talk, 16th ACM-IEEE International Conference on Formal Methods and Models for System Design, Beijing, China, 10/16/2018

- Plenary talk, 15th Aisan Logic Conference, Daejeon, Korea, 7/11/2017

- Invited seminar, UC Berkeley, USA, 10/26/2015

- Invited seminar, FireEye.com, Dresden, Germany, 7/22/2015

- Invited seminar, École Normale Supérieure, Paris, France, 2/19/2015

- Invited seminar, École Normale Supérieure, Paris, France, 2/19/2015

- Invited talk, The 8th International Symposium on Theoretical Aspects in Software Engineering(TASE)'14, Changsha, China, 9/02/2014

- Invited seminar, École Normale Supérieure, Paris, France, 6/27/2014

- Invited seminar, MIT CSAIL, USA, 4/23/2012

- Invited seminar, National Institute of Informatics, Tokyo, Japan, 1/10/2012

- Invited seminar, MIT CSAIL, USA, 6/14/2011

- Invited seminar, École Normale Supérieure, Paris, France, 6/09/2011

- Invited seminar, Oxford Univ., UK, 6/06/2011

- Invited seminar, UC Berkeley, USA, 5/31/2011

- Invited seminar, Tsinghua University, Beijing, China, 12/02/2010

- Invited seminar, Hongkong University of Science and Technology, Hongkong, 11/13/2010

- Invited seminar, EADS(European Aeronautic Defence and Space Company), Paris, France, 6/25/2009

- Invited talk, International workshop on Program Understanding, Novosibirsk, Russia, 6/15/2009
- Invited seminar, SUN Microsystems, Burlington, MA, USA, 6/10/2008
- Invited seminar, MIT Lincoln Laboratory, USA, 6/02/2008
- Invited seminar, Laboratory for Computer Science and Artificial Intelligence, MIT, USA, 5/9/2008
- Invited seminar, Computer Science Department, Carnegie Mellon University, USA, 2/15/2008
- Invited talk, 30 Years of Abstract Interpretation, San Francisco, 1/09/2008,
- Invited seminar, School of Computing, National University of Singapore, 10/25/2007
- Invited seminar, National Institute of Informatics, Tokyo, Japan, 7/17/2007
- Invited seminar, Dagstuhl Seminar 06281 on "The Challenge of Software Verification", 7/8/2006 - 7/15/2006, Germany
- Invited seminar, Dagstuhl Seminar 03101 on "Resoning about Shape", 3/2/2003 - 3/7/2003, Germany
- Invited seminar, CRISTAL group, Institut National de Recherche en Informatique et en Automatique(INRIA), France, 7/4/2002
- Visiting Professor, Computer Science Departemnt, École Normale Supérieure, Paris, 7/1/2002 - 8/31/2002
- Invited seminar, Computer Science Departemnt, École Normale Supérieure, Paris, 7/12/2001 - 7/14/2001 "System Zoo: towards a realistic program analyzer generator"
- Invited seminar, Dept. of Information Science, Univ. of Tokyo, 3/17/2000 - 3/20/2000
- Invited seminar, "Static Analysis for Code Compaction and Safety Assurance ", Research Institute of Mathematical Sciences, Kyoto Univ., 3/15/1999 - 3/16/1999
- Invited speaker, "Static Value Slicing", The 1st Japanese Programming and Programming Languages Workshop, 3/17/1999 - 3/19/1999
- Invited seminar, New Jersey Programming Languages and Systems Seminar Series, Bell Laboratories, Murray Hill, New Jersey, 7/20/1997 - 7/29/1997

Selected Publications

- "Inductive Program Synthesis via Iterative Forward-Backward Abstract Interpretation", Yongho Yoon and Woosuk Lee and Kwangkeun Yi, **PLDI 2023**
- "Optimizing Homomorphic Evaluation Circuits by Program Synthesis and Time-Bounded Exhaustive Search", Dongkwon Lee and Wooseok Lee and Hakjoo Oh and Kwangkeun Yi, **TOPLAS** Vol. 45, Issue 3, Article No.16, pp.1-37, September 2023
- "Optimizing Homomorphic Evaluation Circuits by Program Synthesis and Term Rewriting", Dongkwon Lee and Wooseok Lee and Hakjoo Oh and Kwangkeun Yi, **PLDI 2020**
- "Adapting Static Analysis via Learning with Bayesian xo Optimization", Hakjoo Oh and Kihong Heo and Hongseok Yang and Kwangkeun Yi, **TOPLAS** Vol.40, Issue 4, 2018
- "Sound Non-Statistical Clustering of Static Analysis Alarms", Woosuk Lee and Hakjoo Oh and Kihong Heo and Kwangkeun Yi, **TOPLAS** Vol.39, Issue 4, 2017
- "Selective X-Sensitive Analysis Guided By Impact Pre-Analysis", Hakjoo Oh and Wonchan Lee and Kihong Heo and Hongseok Yang and Kwangkeun Yi, **TOPLAS**, Vol.38, Issue 2, 2016
- "Global Sparse Analysis Framework", Hakjoo Oh and Kihong Heo and Wonchan Lee and Woosuk Lee and Daejun Park and Jeehoon Kang and Kwangkeun Yi, **TOPLAS**, Vol.36, Issue 3, 2014

- "Selective Context-Sensitivity Guided by Impact Pre-Analysis", Hakjoo Oh and Wonchan Lee and Kihong Heo and Hongseok Yang and Kwangkeun Yi, **PLDI 2014**
- "Design and Implementation of Sparse Global Analyses for C-like Languages", Hakjoo Oh and Kihong Heo and Wonchan Lee and Woosuk Lee and Kwangkeun Yi, **PLDI 2012**
- "The Implicit Calculus: A New Foundation for Generic Programming", Bruno Oliveira and Tom Schrijvers and Wontae Choi and Wonchan Lee and Kwangkeun Yi, **PLDI 2012**
- "Static Analysis for Multi-Staged Programs via Unstaging Translation", Wontae Choi and Baris Aktemur and Kwangkeun Yi and Makoto Tatsuda, **POPL 2011**
- "A Polymorphic Modal Type System for Lisp-like Multi-Staged Languages", Ik-Soon Kim and Kwangkeun Yi and Cristiano Calcagno, **POPL 2006**
- "Automatic Generation and Management of Interprocedural Program Analyses", Kwangkeun Yi and Luddy Harrison, **POPL 1993**
- "Termination Analysis with Algorithmic Learning", Wonchan Lee and Bow-Yaw Wang and Kwangkeun Yi, **CAV 2012**
- "Machine-Learning-Guided Selectively Unsound Static Analysis", Kihong Heo and Hakjoo Oh and Kwangkeun Yi, **ICSE 2017**
- "MeCC: Memory Comparison-Based Clone Detector", Heejung Kim and Yungbum Jung and Sunghun Kim and Kwangkeun Yi, **ICSE 2011**

Teaching Classes

- SNU 4541.664A: Program Analysis (graduate)
- SNU 4541.780: Topics in Programming Language (graduate)
- SNU 4190.310: Programming Languages (undergraduate)
- SNU 4190.210: Principles of Programming (undergraduate)
- SNU 400.02: Engineering Math II: Logic in Computing (undergraduate)
- SNU 010.142: Basics in Computing (undergraduate)
- SNU 046.016: Computational Civilization (undergraduate)

Honors
- 2017, Excellence in Education Award, Seoul National University
- 9/2008 – 3/2016: Directorship, ROSAEC Center (Research On Software Analysis for Error-free Computing), Engineering Research Center of Excellence, Korea Science & Engineering Foundation
- 6/2007: 17th Annual Distinguished Scientific and Technological Paper Award, The Korea Federation of Science and Technology Societies
- 9/1998 – 7/2003: Directorship, Center for Research On Program Analysis System, National Creative Research Initiative Grant Program, Korea Ministry of Science and Technology
- 9/2001: Kaheon Academic Excellence Award, Korea Information Science Society
- 1984 – 1986: Undergraduate Fellow, Korea Foundation for Advanced Studies
- 1983: 1st-ranked in entrance exam, Division of Mathematics, Computer Science, and Statistics, College of Natural Science, Seoul National University