Yong-Jun Shin

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Summary

Dr. Yong-Jun Shin is a senior researcher at ETRI, a national research institute in South Korea, and also serves as a lecturer at the AI Academy at ETRI. He received a Ph.D. in software engineering at KAIST under the guidance of Professor Doo-Hwan Bae in 2023. His Ph.D. research focused on data-driven environment model generation for efficient verification of cyber-physical systems software. His current research interests include model-based software engineering, SW verification and validation, mobility & robotics SW, and edge computing. His academic activities can be found on his homepage (yongjunshin.github.io).

Experience

- **Electronics & Telecommunications Research Institute (ETRI)**
  Lecturer at AI academy — *10 2025 - Present*
  Senior researcher — *03 2025 - Present*
  Researcher — *01 2023 - 02 2025*

Education

- **Korea Advanced Institute of Science and Technology (KAIST)** — *03 2017 - 02 2023*
  Ph.D in software engineering
  - Thesis: Virtual Environment Model Generation for CPS Goal Verification using Imitation Learning
  - Advisor: Prof. Doo-Hwan Bae
- **Handong Global University** — *03 2013 - 02 2017*
  BS in computer science

Honors and Awards

- **Best Artifact Paper Award** — *2021*
  16th Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)
- **Best Paper Award** — *2019*
  2019 Korea Computer Congress (KCC)
- **Outstanding Paper Award** — *2018*
  2018 Korea Software Congress (KSC)
- **Best Paper Award** — *2018*
  20th Korea Conference on Software Engineering (KCSE)

Publications

C=Conference, J=Journal, T=Thesis

[J.7] Shin, Yong-Jun (2026). **Modeling and Verification of ROS 2 Callback Concurrency Using UPPAAL Model Checker**. In *International Journal of Software Engineering and Knowledge Engineering*

[J.6] Shin, Yong-Jun (2026). **Runtime Verification of Cause–effect Latency in Black-box Systems**. In *Information and Software Technology*

[C.21] Lee, Junhee and Shin, Yong-Jun and Kang, SungJoo (2025). **MALE: A Multi-Objective Evaluation Method for AI Mobility Services across the Cloud-Edge-Device Continuum**. In *2025 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*

[C.20] Shin, Yong-Jun and Utz, Wilfrid (2025). **A Platform-Independent Software-Intensive Workflow Modeling Language And An Open-Source Visual Programming Tool: A Bottom-Up Approach Using Ontology Integration Of Industrial Workflow Engines**. In *The 40th ACM/SIGAPP Symposium On Applied Computing (SAC)*

[J.5] Shin, Yong-Jun and Shin, Donghwan and Bae, Doo-Hwan (2024). **Virtual Environment Model Generation for CPS Goal Verification using Imitation Learning**. In *ACM Trans. Embed. Comput. Syst.*

[T.1] Shin, Yong-Jun (2023). **Data-driven Environment Model Generation using Imitation Learning for Efficient Cyber-Physical System Goal Verification**. In *Ph.D. Thesis. Korea Advanced Institutte of Science and Technology (KAIST)*

[C.19] Cho, Esther and Shin, Yong-Jun and Hyun, Sangwon and Kim, Hansu and Bae, Doo-Hwan (2022). **Automatic Generation of Metamorphic Relations for a Cyber-Physical System-of-Systems Using Genetic Algorithm**. In *2022 29th Asia-Pacific Software Engineering Conference (APSEC)*

[C.18] Cho, Esther and Kim, Hansu and Shin, Yong-Jun and Bae, Doo-Hwan (2022). **Automatically Generating Behavior Descriptions of a Cyber-Physical System-of-Systems**. In *Korea Computer Congress (KCC)*

[C.17] Shin, Yong-Jun and Cho, Esther and Kim, Hansu and Bae, Doo-Hwan (2022). **Hands-on Field Operational Test Dataset of A Multi-controller CPS: A Modeled Case Study on Autonomous Driving**. In *2022 17th Annual System of Systems Engineering Conference (SOSE)*

[C.16] Shin, Yong-Jun and Bae, Joon-Young and Bae, Doo-Hwan (2021). **Concepts and Models of Environment of Self-Adaptive Systems: A Systematic Literature Review**. In *2021 28th Asia-Pacific Software Engineering Conference (APSEC)*

[C.15] Baek, Young-Min and Cho, Eunho and Shin, Yong-Jun and Bae, Doo-Hwan (2021). **A Modeling Method for Representation of Geographical Information of a System-of-Systems**. In *2021 16th International Conference of System of Systems Engineering (SoSE)*

[C.14] Shin, Seungchyul and Hyun, Sangwon and Shin, Yong-Jun and Song, Jiyoung and Bae, Doo-Hwan (2021). **Uncertainty-based Fault Type Identification for Fault Knowledge Base Generation in System of Systems**. In *2021 16th International Conference of System of Systems Engineering (SoSE)*

[C.13] Shin, Yong-Jun and Liu, Lingjun and Hyun, Sangwon and Bae, Doo-Hwan (2021). **Platooning LEGOs: An Open Physical Exemplar for Engineering Self-Adaptive Cyber-Physical Systems-of-Systems**. In *2021 International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*

[C.12] Shin, Yong-Jun and Cho, Eunho and Bae, Doo-Hwan (2021). **PASTA: An efficient Proactive Adaptation Approach Based on Statistical Model Checking for Self-Adaptive Systems**. In *International Conference on Fundamental Approaches to Software Engineering (FASE)*

[C.11] Baek, Young-Min and Mihret, Zelalem and Shin, Yong-Jun and Bae, Doo-Hwan (2020). **A Modeling Method for Model-based Analysis and Design of a System-of-Systems**. In *2020 27th Asia-Pacific Software Engineering Conference (APSEC)*

[C.10] Park, Su-Min and Shin, Yong-Jun and Hyun, Sangwon and Bae, Doo-Hwan (2020). **Simva-sos: Simulation-based Verification and Analysis for System-of-Systems**. In *2020 IEEE 15th International Conference of System of Systems Engineering (SoSE)*

[J.4] Shin, Seungchyul and Hyun, Sangwon and Shin, Yong-Jun and Song, Jiyoung and Bae, Doo-Hwan (2019). **Manifestation Location-based Classification of Uncertainty Factors Considering Characteristics of System-of-Systemss**. In *KIISE Transactions on Computing Practices*

[J.3] Hyun, Sangwon and Shin, Yong-Jun and Bae, Doo-Hwan (2019). **Analysis of Utilization Methods of the Statistical Model Checking Results for Localizing Faults on System of Systems**. In *Journal of KIISE*

[C.9] Cho, Eunho and Shin, Yong-Jun and Jee, Eunkyoung and Bae, Doo-Hwan (2019). **Comparative Analysis of fault-attack tree based safety and security assessment approaches**. In *Korea Computer Congress (KCC)*

[C.8] Hyun, Sangwon and Shin, Yong-Jun and Bae, Doo-Hwan (2019). **Analysis of Utilization Methods of Statistical Model Checking Results for Localizing Faults on System of Systems**. In *Korea Computer Congress (KCC)*

[C.7] Shin, Yong-Jun and Baek, Young-Min and Jee, Eunkyoung and Bae, Doo-Hwan (2019). **Data-driven Dnvironment Modeling for Adaptive System-of-Systems**. In *Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing (SAC)*

[C.6] Shin, Yong-Jun and Hyun, Sangwon and Baek, Young-Min and Bae, Doo-Hwan (2019). **Spectrum-based Fault Localization on a Collaboration Graph of a System-of-Systems**. In *2019 14th Annual Conference System of Systems Engineering (SoSE)*

[C.5] Kim, Tae-Hwan and Cho, Eunho and Shin, Yong-Jun and Bae, Doo-Hwan (2018). **Data-Driven Traffic Environment System-Dynamics Model Generation & Inference Method**. In *Korea Software Congress (KSC)*

[C.4] Baek, Young-Min and Park, Su-Min and Shin, Yong-Jun and Bae, Doo-Hwan (2018). **A Meta-model for Representing System-of-Systems Ontologies**. In *Proceedings of the 6th International Workshop on Software Engineering for Systems-of-Systems (SESoS)*

[J.2] Baek, Young-Min and Park, Su-Min and Shin, Yong-Jun and Bae, Doo-Hwan (2018). **Analysis of Case Scenario to Develop a System of Systems Meta-model for Ontology Representation**. In *Journal of KIISE*

[C.3] Baek, Young-Min and Park, Su-Min and Shin, Yong-Jun and Bae, Doo-Hwan (2018). **Scenario-based Analysis of System-of-Systems Meta-model and Applicability Analysis for Statistical Verification**. In *Korea Conference on Software Engineering (KCSE)*

[C.2] Baek, Young-Min and Park, Su-Min and Shin, Yong-Jun and Bae, Doo-Hwan (2018). **Development of Ontology-based System-of-Systems Meta-model Based on the Analysis of SoS Case Scenario**. In *Korea Conference on Software Engineering (KCSE)*

[J.1] Kim, Do Hyun and Kim, Jung Eun and Song, Ji Hag and Shin, Yong Jun and Hwang, Sung Soo (2017). **Image-based Intelligent Surveillance System Using Unmanned Aircraft**. In *Journal of Korea Multimedia Society*

[C.1] Shin, Yong-Jun and Yang, Jiyong and Choi, Changbeom (2015). **Research on Flexible Method for Simulation Initialization Using C-Interpreter**. In *Korean Institute of Industrial Engineers (KIIE)*

Academic Services

- **Board Member** *2025 - Present*
  Software Engineering Society, Korean Institute of Information Scientists and Engineers (KIISE)
- **Program Committee** *2024 - Present*
  International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems (SESoS)
- **Program Committee** *2024 - Present*
  International Conference on Software Engineering & Knowledge Engineering (SEKE)
- **Reviewer** *2023*
  Journal of Software: Evolution and Process - special issue on 'Software Engineering for Systems-of-Systems and Software Ecosystems'
- **Live! Team Korea** *2020*
  The 42th International Conference on Software Engineering (ICSE)

Teaching

- **Introduction to Software Testing for Safe AI** *2026 - Present*
  ETRI AI Academy