

Lab. Name	Washizaki & Ubayashi lab. Reliable Software Engineering (63-5F-03,23)
	e-mail: washizaki@waseda.jp http://www.washi.cs.waseda.ac.jp @Hiro_Washi
	Please visit to our laboratory after the lab. assignment is completed.

Research Areas: Reliable Software Engineering for and by AI and NLP

Research Topics

Our research themes include [AI for SE](#), [SE for AI](#), and [ICT education](#). Common fundamental technologies are design patterns that summarize problems and solutions common to the software design and development process, goal-oriented analysis that logically develops requirements and necessary mechanisms based on goals, and evidence- and data-driven prediction and hypothesis testing mechanisms centered on machine learning. We are conducting research in international and industry-academia-government collaboration.

AI for SE: Reuse and evolution by GenAI/ML

- Reliable and efficient development through modularization, reuse and modeling of existing software and development process
- Adaptive maintenance and evolution to changing environment and requirements

**Common foundation
(frameworks and processes)**
Design pattern, goal-oriented analysis,
machine-learning and data-driven

Education and body of knowledge

- K-12 STEM education
- SWEBOK and skills

SE for AI: AI quality assurance

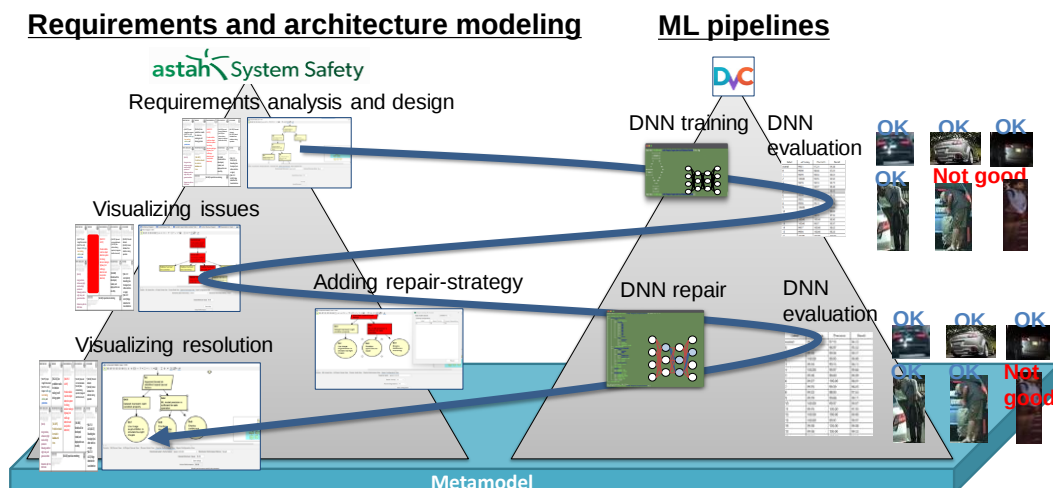
- Testing, modeling, risk, measurement
- ML security

A. [AI for SE:](#)

- Data-driven software maintenance and evolution platform augmented by machine learning, generative AI, and NLP (Collaboration: Polytechnique Montreal, Concordia U., Tokyo Institute of Technology, Grant-in-Aid for Scientific Research Collaboration, etc.)
- Software development knowledge systematization, software requirement analysis, problem report analysis, and development support by applying machine learning, generative AI, and natural language processing (Collaboration: Hitachi, e-Seikatsu, Denso, etc.)
- Process design incorporating organizational and management goals and requirements

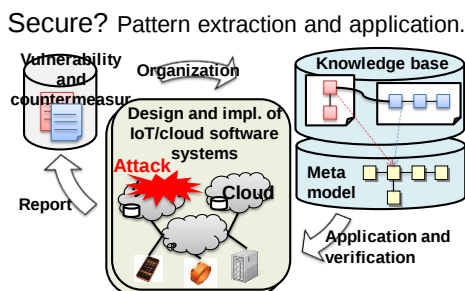
B. [Quality of complex systems including AI systems \(including SE for AI\):](#)

- Reliability machine learning and AI systems by software engineering based on multi-view modeling and workflow pipeline integration (Aisin, Fujitsu, etc.)
- Ecosystem of knowledge and artifacts related to security and privacy of complex software systems including machine learning systems (Institute of Information Security, etc.)
- Quality measurement, validation, testing, and Improvement of software systems and agile development processes (GAIO Technology, Digital Hearts/AGEST, etc.)



C. Education and training in ICT and programming:

- Programming and information education for young people (Life-Is-Tech et al.)
- Realization of development and operation processes that utilize knowledge systems and international standards (NEC et al.)
- Recurrent education for working people in the fields of IoT, AI, and IoT (Smart SE)



How to teach programming?

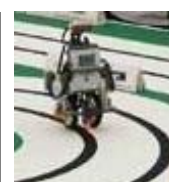
Learning tools investigation.

Lab. Members: 2 Professors, 1 Guest Professor, 1 Guest Associate Professor, 3+ Doctor Students, 15+ Master Students incl. international course students

Two full-time faculty members provide research guidance under a world-standard system.

- [Prof. Washizaki \(IEEE Computer Society 2025 President\)](#)
- [Prof. Ubayashi \(Former professor and vice-director at Kyushu University\)](#)

Lab. Meetings: There are weekly lab seminars and weekly group meetings. Moreover, students often form teams to conduct projects such as participation in business planning contest and software development hackathon.



Events: [Apr] Welcome Party, [Aug-Sep] Summer Camp incl. Thesis Intermediate Presentation, [Dec-Jan] Year-end and New Year's party, [Feb] Thesis Defense, [Mar] Farewell Party. Frequent sports and parties.



Open House: Mar 18th, 19th, and 21st (TBD, See Web site)

Job Opportunity and Overseas Visit:

Since most of our projects are funded, [students are basically eligible to get hired as Research Support Staffs](#) in the laboratory by conducting research in the project room. Graduate students can [visit Canada for joint research with Concordia U. and Polytech Montreal](#) in the area of Machine Learning and Software Engineering.

Vision 2024

Having the vision [“Smart systems and software engineering for business and society by connecting AI, IoT and software engineering”](#), we push forward with research on novel and actionable systems and software engineering methods to contribute to software and systems engineering industry and academia in collaboration with 10+ local and global partners including [Hitachi, Aisin, Denso, NEC, e-Seikatsu, GAIO, Digital Hearts/AGEST, Life-is-Tech, Concordia University, Polytechnique de Montreal, and University of Victoria.](#)

We will lead professional activities in terms of bodies of knowledge, education and training and business developments in relation to the lab activities and achievements. Like previous years, we expect many new students coming from various countries. Our team is growing and having more diversity in national origins, backgrounds and mindsets. Such diversity contributes to our team in various aspects such as creativity to advance the above-mentioned projects and professional contributions. [We welcome your joining of our world-class research team!](#)

