Program

International Advanced School on Automotive Software Engineering

名古屋

March 7-8, 2011
Nanzan University
Nagoya, Japan

Sponsor: Graduate School of Mathematical Sciences and Information Engineering, Nanzan University

Welcome

Welcome to the International Advanced School on Automotive software Engineering (IAS-ASE) 2011. This is the second after the first summer school titled Symposium on Automotive/Avionics Systems Engineering (SAASE 2009) held in University of California at San Diego.

For last several years, we are witnessing that software is the source of innovation in automotive. However, a number of researchers and engineers are concerning on the extremely-rapid growth of automotive software in its size and complexity. Furthermore, automotive, like a smartphone, is becoming fully connected to our society, and play an important role as information infrastructure of the society. Now, innovation is necessary for automotive software engineering.

To motivate researchers and engineers in automotive software engineering, we create a new initiative of international advanced school on automotive software engineering (IAS-ASE), where we can learn and discuss on the latest technologies and practices in automotive software engineering. On behalf of the organizing committee, I hope you enjoy the lectures and discussions, and create social networks for working together to innovate automotive software engineering.

Mikio Aoyama

Sponsor

Graduate School of Mathematical Sciences and Information Engineering, Nanzan University

In Cooperation with

Society of Automotive Engineers of Japan (JSAE)

Information Processing Society of Japan (IPSJ) SIG Software Engineering

With the Support of

Information Technology Promotion Agency, Japan (IPA)

Central Japan Industries Association

Organizing Committee

Mikio Aoyama (Nanzan University, Japan)

Manfred Broy (Technical University of München, Germany)

Ingolf Krüger (University of California at San Diego, U.S.A.)

Hiroyuki Murayama (Denso, Japan)

K. Venkatesh Presad(Ford Motor, U.S.A.)

Keiji Yamamoto (Toyota IT Center, Japan)

Past Related Events

SAASE 2009 (Symposium on Automotive/Avionics Systems Engineering)
[http://www.jacobsschool.ucsd.edu/GordonCenter/g_leadership/l_summer/saase.shtml

ICSE 2009(Int'l Conference on Software Engineering) Experience Track on Automotive Systems
[http://icse08.upb.de/calls/automotive.html]

AuRE 2004, AuRE 2006 (Automotive Requirements Engineering Workshop)
[http://www.seto.nanzan-u.ac.jp/~amikio/NISE/AuRE/]

Program

March 7 (Mon), WINC AICHI 10F Room 1002

10:00-10:15 Welcome and Introduction
Masami Noro, Atsuo Suzuki, Mikio Aoyama (Nanzan University)

10:15-11:30 Keynote
Automotive Systems and Software in the Social Infrastructure
Tadao Saito (CTO/Chief Scientist, Toyota InfoTechnology Center,
Professor Emeritus, The University of Tokyo, Japan)

11:30-12:45 Engineering Innovation I
Variability Management in Software Product Line Engineering,
Kyo Chul Kang (Professor, POSTECH, Korea)

Lunch

14:00-16:00 Real World Innovaiton I
An Approach to Practical Validation of Control Software Specification
Tomoyuki Kaga (Toyota Motor, Japan) and Masakazu Adachi (Toyota Central R&D Labs., Japan)

The Complexity of Automobile Software Systems and Some Design Approaches
K. Venkatesh Prasad (Ford Motor, USA)

Coffee Break

16:15-18:15 Real World Innovaiton II
Contextual Design and Automotive HMI Innovation
Andrew W. Gellatly (General Motors, USA)

Technologies of IT Systems for Nissan LEAF
Gaku Sone (Nissan Motor, Japan)

18:30-20:00 Networking & Reception at WINC AICHI

March 8 (Tue), Nanzan University, Seto Campus, Room G101

9:30-12:00 Engineering Innovation II
Model-Based Development of Deterministic, Portable Real-Time Software Components with the Timing Definition Language (TDL) and Advanced Simulation Tools
Wolfgang Pree (Director, Embedded Software & Systems Research Center, University of Salzburg, Austria)

AI-based and Data Mining-based Methods for Diagnosing Automotive Systems
Takuro Kutsuna (Toyota Central R&D Labs., Japan)

Lunch

13:00-14:00 Engineering Innovation II (Cont'd)
Automotive Could Services Systems Based on Service-Oriented Architecture
Akihito Iwai (Denso, Japan)

14:00-15:00 Challenges and Future Directions
Challenges and Future Directions of Automotive Software Engineering
Mikio Aoyama (Nanzan University)

Coffee Break

15:30-17:00 Tour at Toyota Automotive Museum
Special Exhibition: Reviewing 125-Year History of Automobiles by Collection Cars & Literature
[http://www.toyota.co.jp/Museum/]

March 9 (Wed): Tour to Toyota Factory (For those who are interested, free for charge; Pre-registration required)

Keynote

Automotive Systems and Software in the Social Infrastructure

Tadao Saito (CTO/Chief Scientist, Toyota InfoTechnology Center, Professor Emeritus, the University of Tokyo)

Abstract

In the history of human being, people actively move around the world in variety of ways and establish everyday life by constructing infrastructure to keep stable society.

In one century of global penetration of automobile, various infrastructures including city structure, road and highways suited for automobile have been constructed taking long period. Recently, new infrastructure including telecommunication network to make safer and more convenient automobile have attracted interests.

Information technology which has been established to use stand-alone computers expanded rapidly to cope with new markets including automobile. Recent advances of information technology helped to realize many dreams which ware difficult in past environment. However, the software in automobile must be constructed understanding environment different from usual computer world. Software engineering to be applied to automobile must be established understanding conditions in automobile which operate in a society of people and infrastructure.

The presentation will cover variety aspect of conditions which software engineer should notice to realize future automobile which is used in human society. Requirements to communication technology and to realize future automobile will also be explained.

Biography

Prof. Tadao Saito received the Ph. D degree in electronics from the University of Tokyo in 1968. Since then he was a professor of the University of Tokyo, where he is now a Professor Emeritus. Since April 2001, he is the Chief Scientist and CTO of Toyota InfoTechnology Center, where he studies future ubiquitous information services around automobile.

He worked in variety of subjects related to digital communication and computer networks. His research includes variety of communication networks and its social applications such as ITS. Included in his past study, 1970's he was a member of designing group of Tokyo Metropolitan Area Traffic Signal Control System designed to control 7000 intersections under Tokyo Police Authority. Since 2001 he works for variety of application of ICT for automobile connecting concept gap in two technologies as the CTO of Toyota InfoTechnology Center. He is also the chairman of Ubiquitous Networking Forum of Japan working for future vision of information society and the chairman of New Generation IP Network Forum of Japan. He wrote two books on electronic circuitry, four books on computers software and two books on digital communication and multimedia. From 1998 to 2002 he was the chairman of Telecommunication Business Committee of the Telecommunication Council of Japanese government and contributed to regulatory policy of telecommunication business for broadband network services which resulted in penetration of world fastest network services in Japan in 5 years after the decision of the policy. He is also the Japanese representative of International Federation of Information Processing General Assembly and TC 6 (Communication System). He is a life fellow of IEEE and honorary member and fellow of IEICEJ.

Engineering Innovation I

Variability Management in Software Product Line Engineering

Kyo Chul Kang (Professor, Dept. of Computer Science and Engineering, POSTECH, Korea)

Abstract

Product line software engineering (PLSE) has been recognized as a key software development paradigm for meeting diverse needs of the global market efficiently and effectively giving competitive advantages to IT industries and embedded systems developers. The Product Line Engineering Program of SEI (www.sei.cmu.edu) and a series of Esprit and ITEA projects of EU sparked researches and technology transfer efforts in this area since early 90's.

The PLSE paradigm has been changing the way software developers think about software development: from the single application view to the application family, i.e., product line view. Several software engineering concepts and techniques have been developed to support the product line engineering, including commonality and variability analysis, variation points and variants, variability management, and generative programming. As the PLSE paradigm has been applied to large scale domains such as automobile and mobile communications, the ability to manage variability effectively has been recognized as a key success factor. In my talk, I will give an overview the evolution of reuse concepts, discuss various dimensions of variability management, give a brief introduction of the method that I have been working on, and then discuss research issues.

Biography

Dr. KyoChul Kang received his PhD from the University of Michigan in 1982. Since then he has worked as a visiting professor at the University of Michigan and as a member of technical staff at Bell Communications Research (Bellcore) and AT&T Bell Laboratories before joining the Software Engineering Institute, Carnegie Mellon University as a senior member in 1987. He is currently a professor at the Pohang University of Science and Technology (POSTECH) in Korea. He served as General Chair for the 8th International Conference on Software Reuse (ICSR) held in Madrid, Spain in 2004, General Chair for the 11th International Software Product Line Conference (SPLC2007) held in Kyoto, Japan in September 2007, and also for the 14th International Software Product Line Conference (SPLC2010) to be held in Jeju, Korea in September 2010.

While at the University of Michigan, he was involved in the development of PSL/PSA, a requirements engineering tool system, and a Meta modeling technique. Since then his research has focused on software reuse and software product line engineering, developing Feature-Oriented Domain Analysis (FODA) technique at SEI. His current research areas include software reuse and product line engineering, requirements engineering, and computer-aided software engineering.

Real World Innovation I

An Approach to Practical Validation of Control Software Specification


Tomoyuki Kaga (Toyota Motor, Japan), and

Masakazu Adachi (Toyota Central R&D Labs., Japan)

Abstract

Automotive control systems function to interact with physical environment and drivers. Due to this openness, system prototyping is necessary to capture potential software requirement. It is usual that prototyping is repeated several times before fully identifying requirement.

To improve productivity of prototyping loops, Model-based Development (MBD) has been promoted. Simulink is popular in automotive industry to model control software, and together with physical plant models, it enabled us to design over closed-loop simulator which is far cost effective than experiments. Automated code generation is another benefit of using models as executable specification.

Though the productivity has been much improved after introduction of MBD, systematic validation of specification itself remains as a big open problem. Typical approach is exhaustive testing using closed-loop simulation, test-bed and so on, but it is hard to get a sense of completion since there is not good measure of exhaustiveness. If desirable/undesirable behaviors can be formulated in formal manner and the problem size is small, formal verification can be applied, but such a case is limited so far.

As a remedy for this problem, a tool framework of interactive validation based on design interest extraction from prototype software has been developed and started to be deployed to production software development in TMC.

The basic idea is giving up exhaustive testing or property proving which requires formal property description, but mechanically selecting conditions, which reflect the design interests, to the number that case-by-case manual confirmation is possible.

Even with MBD, points to be validated are not so obvious, since implementation details make it difficult to understand actual functional components. Interaction with legacy C codes worsens the situation.

Currently, a kind of inter-procedure dataflow graph can be extracted from C codes and abstraction and slicing technique are applied. Functional components are presented as dataflow snapshots which are made from combination of selectors in the original dataflow. In addition to this structural analysis, model checker based auto test generator allows us to confirm behaviors of the snapshots in pinpoint manner.

In this talk, details of this tool framework will be presented.

Biography

Tomoyuki Kaga received his B.E., M.E. and Ph.D. from Nagoya University, Japan in 1996, 1998 and 2001, respectively. He joined Toyota Motor Corporation in 2001, and started his work on model-based design of automotive control software. From 2004 to 2007, he was a visiting industrial fellow of the Center for Hybrid and Embedded Software Systems at the University of California at Berkeley. He is currently responsible for development of V&V methods and their application to production development process. His research interests include model-based development, V&V methods and control software modeling.

Masakazu Adachi received B.E., M.E., and Ph.D. degrees from Osaka University in 2002, 2003, and 2006, respectively. From 2005 to 2006, he was a Research Fellow of Japan Society for the Promotion of Science (JSPS). He was a visiting researcher at Carnegie Mellon University in 2006. In 2007, he joined Toyota Central R&D Labs., Inc. His research interests include formal technologies for analysis and verification of embedded software.

Real World Innovation I

The Complexity of Automobile Software Systems and Some Design Approaches

K. Venkatesh Prasad (Group and Senior Technical Leader, Ford Motor, USA)

Abstract

An automobile software system, for purposes on this talk, is an assembled set of software components along with their pre-specified set of permissible interactions. The system may be physically located in a single hardware module or may be distributed across multiple modules. With a linear growth in the number of networked modules there has been an exponential growth in their interactions, and hence the commensurate growth in overall complexity. The growth in complexity will be examined along three dimensions of demands: (1) regulatory demands, such as improved fuel economy, reduced tailpipe emissions and enhanced safety, (2) consumer demands for intense personalization and, (3) business demands for sustainable growth.

Using cases in the area of in-vehicle consumer connectivity, several design approaches will be described, along with an overview of the associated toolsets.

Biography

K. Venkatesh Prasad is the Group and Senior Technical Leader for Electrical & Electronics, at Ford Motor Company. He is a member of Ford's Technology Advisory Board (a group of the eight senior most internal technical advisors), and in this capacity, reports to the Ford's CTO & Vice President for Global Research & Advanced Engineering, based in Dearborn, Michigan, USA.

Prasad received the B.E. from the University of Madras (NIT-Trichy) in 1980, the M.S.E.E. from IIT, Madras, in 1984, the M.S.E.E. from Washington State University, Pullman, in 1987, and the Ph.D. from Rutgers University, New Brunswick, in 1990, all in Electrical & Computer Engineering.

He is the founder of Ford Motor Company's Infotronics Technologies Group. In this capacity, he has lead teams that have transferred a series of technologies to high-volume automotive production. In 2009, he accepted the Ford Motor Company's highest award for cross-functional collaboration, the President's Technology award, on behalf of Research & Advanced Engineering organization, for technical contributions that lead to the production of Ford's SYNC connectivity technology.

He has over 30 journal, conference and book chapter publications and holds six patents. He is on the advisory board of several private-public academic partnerships involving academia, the government and industry, including the Ford-MIT Strategic Alliance, and the EECS Dep. at Northwestern University. He is the Chair of the ECE Dep. Visiting Committee at Michigan State University. From 1996 to 1998, he lead research in the area of electronic imaging, pattern recognition, and associated vehicle system integration to support active vehicle safety and security applications. From 1992 to 1996, he was a Senior Research Scientist at the Ricoh California Research Center. From 1990 to 1992, he was a Postdoctoral Associate at Rutgers, a Visiting Researcher at the Caltech, and a Caltech faculty-affiliate at NASA's Jet Propulsion Laboratory. Dr. Prasad is a senior member of the IEEE, a member of the ACM, SAE International, a life-member of Sigma Xi, Eta Kappa Nu, and Tau Beta Pi.

Real World Innovation II

Contextual Design and Automotive HMI Innovation

**Andrew W. Gellatly (User Interface Group Lead,
General Motors, USA)**

Abstract

Contextual Design is a customer-centered design process for defining what a system should do and how it should be structured. The process incorporates ethnographic-like methods for learning about customers and includes modeling techniques for making sense of the knowledge gained. The approach unifies an organization's actions into a coherent solution to meet customer needs and wants. Contextual Design focuses design activities on the customer and their work, versus leaving team members to argue using personal opinion, anecdotes, or unverifiable claims about what customers would like.

In this talk, I will describe how General Motors adapted the Contextual Design process to gain a deeper understanding of how customers interact with today's technologies in their vehicles, under a variety of driving conditions, representing unique driver populations. A primary intent was to learn how drivers balanced interacting with their in-vehicle systems and technologies with the primary task of driving. A secondary intent was to understand how customers learn about the various features and functions in their new vehicles. During the talk, I will share some lessons learned in applying Contextual Design in the automobile environment.

Finally, I will discuss how the results of our Contextual Design efforts helped General Motors to conceptualize and develop the future of infotainment and telematics systems that support and extend customers' in-vehicle experiences and create delight. In the end, I hope that you will appreciate how the Contextual Design process can lead to automotive innovations that are realized through good software engineering

Biography

Andy Gellatly is the global lead for User Interface (UI) at General Motors, working there for 8 years designing and evaluating the interactions for software-driven products including infotainment, telematics, and active safety systems.

He has also worked on the interaction design of consumer electronics and medical devices while working at Kodak, Microsoft, and Baxter Healthcare. Prior to working in industry, Andy performed human factors research on driver vision and performance at the University of Michigan Transportation Research Institute and the Virginia Tech Center for Transportation Research (now the Virginia Tech Transportation Institute).

He has a Ph.D. in Industrial and Systems Engineering from Virginia Tech and has authored or co-authored 45 peer-reviewed publications and technical reports in the areas of transportation human factors and healthcare human factors. Andy holds 3 U.S. patents.

Real World Innovation II

Technologies of IT Systems for Nissan LEAF

Gaku Sone (Senior Manager, IT and ITS Engineering Department
Nissan Motor, Japan)

Abstract

Nissan LEAF that is a new model of an Electric Vehicle has dedicated IT system as standard equipment. Concept of this IT system, Services provided to owners and technical solutions to be introduced.

Biography

Gaku Sone joined to Nissan Motor in 1990. He has been involving in the development car navigation systems and other automotive electronics system, production design of electronics systems, and strategic technology planning.

Engineering Innovation II

Model-Based Development of Deterministic, Portable Real-Time Software Components with the Timing Definition Language (TDL) and Advanced Simulation Tools

Wolfgang Pree (Director, Embedded Software & Systems Research Center, University of Salzburg, Austria)

Abstract

We first present the Timing Definition Language (TDL), which supports the development of embedded real-time systems. TDL is conceptually based on the time-triggered programming model introduced by Giotto but provides a more convenient syntax, more control over the timing of periodic activities, a full-fledged tool chain, and, most importantly, adds a component model and supports the integration of asynchronous activities in a time-triggered system. We present the language concepts and outline the TDL-based tool chain, which also includes support for simulation, distribution, and automatic code generation.

For migrating legacy embedded software to TDL we came up with what we have called Timed Reactive Software (TiReS) simulator. TiReS is a method and tool suite that allows an efficient software-in-the-loop testing which is close to the behavior of the overall system on a specific execution platform. TiReS combines the concepts of discrete event simulation, coroutines and execution time analysis to significantly improve what can be tested on a desktop (host computer) before deploying embedded software on a HiL system or the production platform. TiReS allows adequate regression testing so that the legacy system can be compared to its enhancement. TiReS also supports model-based design space exploration as well as advanced debugging of embedded systems. Using TiReS, one can set breakpoints in the controller and plant models and step back in the code execution (reverse debugging). With TiReS, the entire state of the simulation can be saved and a simulation can be started from a previously saved state.

The presentation explains TiReS's concepts and illustrates its usage in the realm of model-based reengineering of legacy systems. A demonstration of the tool rounds out the presentation.

Biography

Wolfgang Pree is CEO of Chrona and a Professor of Computer Science at the University of Salzburg, Austria. His research focuses on software construction, in particular methods and tools for automating the development of real-time embedded software.

The company is a pioneer in the creation of development and validation tools for the production of reusable embedded software components and systems. Chrona radically redefined how embedded systems are developed, yielding massive savings in cost and time while delivering absolute certainty of performance. These benefits are simply not attainable using traditional tools.

Engineering Innovation II

AI-based and Data Mining-based Methods for Diagnosing Automotive Systems

Takuro Kutsuna (Toyota Central R&D Labs., Japan)

Abstract

Automotive control systems are getting large-scaled and complex each day. Even small-class vehicles equip dozens of electronic control units (ECUs), and this number reaches 100 or more for luxury class vehicles. These ECUs communicate each other via automotive networks such as CAN, LIN, and FlexRay.

In general, the more components a system has, the more difficult it is to detect system failures and locate the root cause of a failure. One reason for this problem is the fault propagation: system components that receive abnormal input data from other components may also output abnormal data even if they are not in abnormal modes, and consequently, many redundant errors are detected in the system. Another reason is that it is hard to apply safety analyses, such as FTA and FMEA, thoroughly to design diagnostic rules when a system is huge, as a result, the designed rules can be insufficient to detect all possible failures. It is important to develop diagnostic methodologies to deal with such problems because automotive control systems may be more complex in the future.

In this talk, a diagnosis method for locating the origin of faults in the system, in which fault propagations may occur, will be introduced. A model-based diagnosis scheme and abstract behavior modeling technique is used to deal with complex software components. The abstract model-based diagnosis is solved based on its formulation into a partial maximum satisfiability problem.

Furthermore, a data mining-based approach will be introduced that generates diagnostic rules automatically from a dataset which is collected when the system is considered to be working normally. A novel one-class classifier, which is built on binary decision diagram techniques, is used to extract diagnostic rules from a collected dataset.

Biography

Takuro Kutsuna received B.E., M.I. degrees from Kyoto University in 2002, 2004, respectively. He joined Toyota Central R&D Labs., Inc. in 2004. His research interests include data mining, machine learning and statistical modeling for diagnosis of embedded software and marketing.

Engineering Innovation II

Automotive Cloud Service Systems Based on Service-Oriented Architecture

Akihito Iwai (Denso, Japan)

Abstract

This talk discusses our concept and first experiences on ACSS (Automotive Cloud Service System) based on SOA (Service-Oriented Architecture) for the next-generation automotive software platform. Today, automotive software systems become large-scale and highly complicated running on some 50 to 100 distributed processors connected through a variety of in-vehicle networks. Automotive software is also connected to outside telematics services/ITS(Intelligent Transportation System) and Web, and plays an important role in our information society. Along with rapid deployment of cloud computing for information services, we expect, automotive software is evolving to ACSS where vehicles are collaborating with outside cloud computing and a variety of social networks including home, office, commerce, and government.

I propose an ACSS based on SOA named DARWIN, and discusses the validity of the DARWIN with case studies running on the prototype implemented in a passenger car of electric vehicle. DSS (DARWIN Service Space) is the core technology in DARWIN, which is a virtual service platform responsible for service orchestration and information sharing over in-and-out-vehicle networks. The study on DARWIN contributes to reveal key aspects of new software architecture for the next generation automotive software, which needs to integrate software in a vehicle and cloud services out of vehicles seamlessly.

Biography

Akihito Iwai is senior manager of electric platform development division (e-PF) in DENSO Corporation where he is in charge of R&D for the development of "Software Platform", a standard software infrastructure throughout the ECUs (Electric Control Units) in automotive E/E systems.

Since entering Nippondenso Co., Ltd (now DENSO Corporation) in 1988, he has been engaged in the software development for ECUs, and after 1996, he has been devoted to the innovation of the automotive software development process using Object Oriented Technology.

He is currently involved in numerous advanced software research projects, and also is contributing to automotive standardization activities including AUTOSAR and JASPAR.

Challenges and Future Directions

Challenges and Future Directions of Automotive Software Engineering

Mikio Aoyama (Professor, Dep. of Software Engineering, Nanzan University)

Abstract

Observing diverse aspects of automotive software engineering, it's necessary to discuss the challenges and future directions of the research and practices in automotive software engineering. One of the key aspects is social network. People preferred to connect one another all the time. SNS (Social Network Service) becomes a powerful infrastructure. Transportation network, information network, smart power grid are all considered as social network services. Besides human transportation, automotive can serve as information and power infrastructure in our society, which creates tremendous opportunities and challenges to automotive software in both technology and business.

As a wrap up session, we discuss the opportunities and challenges in automotive software engineering.

Biography

Mikio Aoyama received MS from Okayama University, Japan, in 1980 and joined Fujitsu Limited, where he involved in the development of large-scale communications software, and the lead of the development and practice of advanced software engineering. From 1986 to 1988, he was visiting scholar at the University of Illinois, USA.

In 1995, he joined Niigata Institute of Technology as a professor. In 2001, he joined Nanzan University.

He published more than 20 books and more than 100 articles. He received best research award from Information Processing Society of Japan in 1993.

He served a chair of SIG Software Engineering of IPSJ (information Processing Society of Japan), and chair of steering committee of APSEC (Asia-Pacific Software Engineering Conference). He also served for numerous international and domestic conferences and professional societies, including workshop chair for ICSE '98, PC chair of ASPEC '98, 99, IEEE/IPSJ EDOC (Enterprise Distributed Object Computing Conference) 2000, PC chair and Workshop chair for ACM IWPSE (International Workshop on Principles of Software Evolution) 2001 and 2002, respectively, PC Co-Chair ICSOC (International Service-Oriented Computing Conference) 2004, General Chair for RE (IEEE International Requirements Engineering Conference) 2004, General Chair for APSEC 2007, and member of editorial board for IEEE Software and IEEE Transactions on Services Computing.

His current research interests include Automotive Software Engineering, Cloud Computing, and Requirements Engineering.

About Graduate School of Mathematical Sciences and Information Engineering, Nanzan University

The Graduate School of Mathematical Sciences and Information Engineering, Nanzan University is located in the north east suburbs of Nagoya, where is one of the international centers of automotive and aerospace industry.

The study of mathematical sciences and information engineering is the scholarly discipline of researching software technology that contributes to the development of mankind by utilizing, to the full extent, modern society's new infrastructure of advanced information and telecommunication systems.

The master and PhD programs cover the four areas of research; software engineering, communications systems, control systems, and mathematical analyses.

In the area of software engineering, we offer study program on software engineering in general as well as intensive study on cloud computing and embedded software systems including automotive software.

For the unified study program from undergraduate to graduate school, we opened department of software engineering in 2009, the first one in Japan.

About Nagoya

Nagoya is located at the center of Japan. It's the global automotive industry centers, where Toyota and its group companies, Honda, Mitsubishi and Suzuki locate. Besides its famous Nagoya castle, you can experience at the Toyota Automotive Museum, and Japanese quality culture.

Access to Nagoya

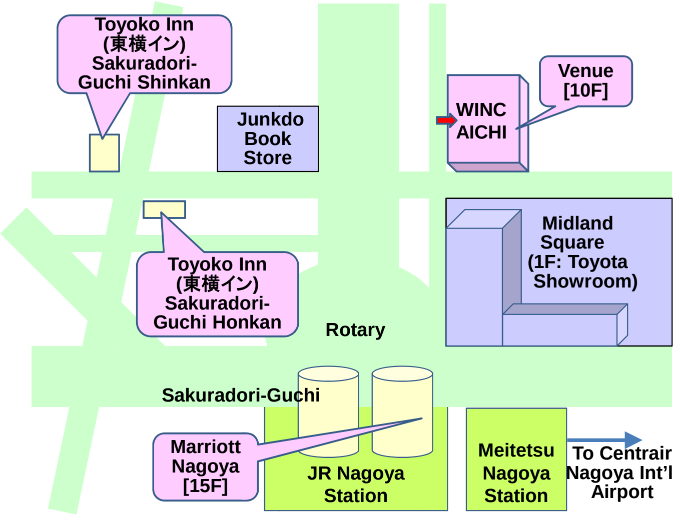
The nearest airport is Chubu Centerair International Airport. From the airport, JR Nagoya station can be reached by express train in 30 min.
Nagoya can be reached in 1 hour and 30 min. from Tokyo by a super express train.

For further information on Nagoya

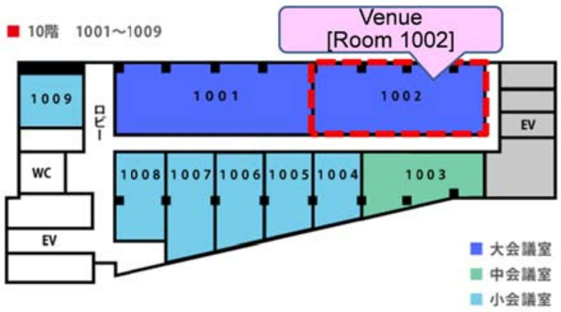
Nagoya Information: Navi http://www.ncvb.or.jp/en/
Chubu Centerair Int'l Airport: http://www.centrair.jp/en/
Kraftsmanship in Japan: http://www.sangyokanko.jp

Venue

WINC AICHI and around Nagoya Station



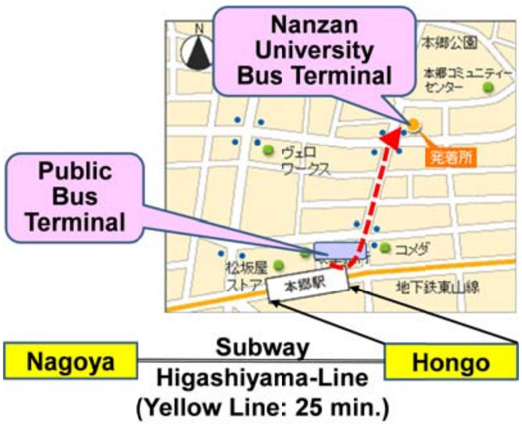
Map of 10th Floor of WINC AICHI



Nanzan University

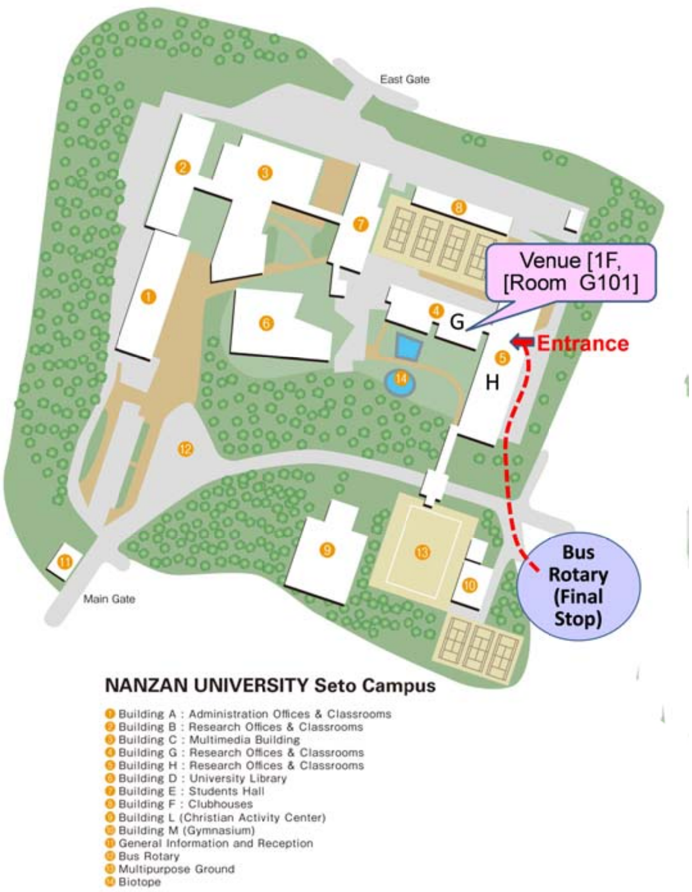
How to Get to Nanzan University Seto Campus from Nagoya

Take a subway Higashiyama-Line (Yellow line) for Fujiga-oak(藤が丘) and get off at Hongo(本郷) station, which is just one stop before Fujiga-oka. Then, walk by 5 min. up to the dedicated bus terminal and take shuttle bus. On March 8th, bus leaves at 8:50, 9:50, and 10:40 in the morning.



Map of Nanzan University Seto Campus

There are two bus stops in the campus. Please get off at the final stop of bus rotary, and walk up to Building H, which is the entrance to the Room G101 in Building G.



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