Fraunhofer FOKUS

FRAUNHOFER INSTITUTE FOR OPEN COMMUNICATION SYSTEMS FOKUS

SYSTEM QUALITY CENTER

Contact
Dr. Tom Ritter
Director
System Quality Center – SQC
Phone +49 30 3463-7278
tom.ritter@fokus.fraunhofer.de

Friedrich Schön
Director
System Quality Center – SQC
Phone +49 30 3463-7453
friedrich.schoen@fokus.fraunhofer.de

Fraunhofer FOKUS
Kaiserin-Augusta-Allee 31
10589 Berlin
Germany

www.fokus.fraunhofer.de/en/sqc

Methods, processes and tools for the development and Quality Assurance of software-based systems

No matter if in telecommunications, railway technology, automotive engineering or public administration – technical systems that support humans in their everyday tasks are everywhere. Often, these systems take over safety- and business-critical functions. For example, in automobiles they trigger the airbags in time and they also protect information-processing networks from attacs. Due to the fact that technical systems are increasingly interconnected, we are now able to develop a wide range of new services and applications, like the dynamic distribution and use of energy in Smart Grids. However, software-based systems have to meet high demands in terms of operational safety, sensitivity of information and access protection. In case of a breakdown, the consequences can range from high financial losses to even live-threatening situations. This is why the scientists of the System Quality Center (SQC) are developing methods, processes and tools to assure the quality of such systems.

System quality from the very beginning

The SQC is a reliable partner when is comes to securing, evaluating and optimising the quality of software-based systems. The scientists create methods, processes and tools to enable Quality Assurance of software-based systems during the whole development process, that is from the requirements analysis up until the certification of the final product. This allows to detect errors and debug the product even in early stages of the development process. This system helps software developers to avoid expensive post-production troubleshooting and debugging. The SQC experts' goal is to develop trust-worthy and secure systems.

Software-based systems have to meet high demands on Quality

Competencies and research focus

The System Quality Center is a cooperation of the Competence Centers MOTION and QUEST. For many years, the scientists have been working on different projects in order to develop and assure the quality of software-based systems. These projects include the development of test beds for Car2X solutions, eHealth products, Ipv6 components, tool integration platforms for the development and Quality Assurance of software as well as solutions to automate and generate testing. Furthermore, domain-specific languages have been used to develop a SIL3-compatible control unit and, for the first time ever, formal verification methods have been applied in railway technologies. Among the core tasks of the System Quality Center are not only model-based development, testing and safety tests, but also carrying out Common Criteria certification of IT products for the German Federal Office for Information Security (Bundesamt für Sicherheit in der Informationstechnik/ BSI). The focus of the scientists is to optimise development processes, system architecture, system design, as well as testing and verifying software-based systems. To do so, they use their knowledge in as many fields as information technology, telecommunication, automotive engineering, railway technology and medical technology. Furthermore, the SQC scientists continuously work on adjusting norms and standards together with their customers and partners.

System quality as a prerequisite for competitiveness

Reliable, safe and trustworthy high-quality systems protect you from high financial losses and prevent personal damages, but they are also crucial for the competitiveness of IT companies. This is why the experts of the System Quality Center are working on supporting the system quality of software-based systems during the whole development process by the means of different methods, processes and tools. Due to their long-term experience, they design, develop and audit systems and prepare them for certification in a time- and cost-efficient manner. The Competence Center focuses on offering different methods to assure the quality of safety- and business-critical processes, for example designing systems and architectures, test automation, model-based testing, verification as well as certification support. With its technology- and industry-oriented testing and developing environments, SQC provides a unique infrastructure consisting of networks, platforms and application software as well as testing environments. The researchers of SQC also support their customers when implementing new methods and processes. Furthermore, they offer an independent consultancy service when it comes to choosing the right processes and tools.

What we offer

- requirements analysis
- conformity, interoperability, performance and safety testing
- model-based development and testing of software-based systems
- model management and model quality
- optimisation of system architectures
- qualification and certification of products
- counselling and training for development, testing and Quality Assurance teams
- tool integration

Technologies

- domain-specific languages
- model-based development and testing
- process optimisation and automation
- test automation
- verification

making cities smart

bad | 1402 (Photos: Matthias Heyde / Fraunhofer FOKUS; istockphoto.com/ malerapaso)