

Software Security

System security refers to the protection of a system against unauthorised access and alterations as well as from any damage. In automated systems, security includes the protection of the entire computer system including data, software and hardware.

When working in the area of software security, your tasks include ensuring protection of network and application security against attackers, supporting our experts in penetration testing, analysing vulnerabilities and evaluating the latest technologies.

Examples of Projects:

- Quantitative models predicting the strength of protection against different strategies of analysis
- Dynamic analysis of binaries in regards to software obfuscation
- Use of obfuscation for protection of knowledge
- New techniques for detecting and warding off targeted attacks on IT systems
- Innovative methods to detect vulnerabilities and analyse malware
- Trusted computing environments

Privacy & Cryptography

Privacy Enhancing Techniques (PETs), Blockchain, Cryptocurrency, Privacy Aware Machine Learning (PAML) and Smart Contracts are only a few of the topics covered in the framework of these projects. Take part in researching and developing concepts to ensure trustworthy and future-proof information and communication technologies.

Examples of Projects:

- Quantum cryptography methods to generate and distribute cryptographic keys
- Cryptographic key exchange with radio characteristics
- Distributed machine learning while respecting privacy
- Effect of anonymisation procedures on real data analyses (real use cases, real data), Privacy by Design in real environments

Internet of Things

Digitalisation and the Internet of Things (IoT) have a great impact on our private and professional lives. In this area, the research focuses on the development of technologies which can be used to optimise processes, products and systems.

Examples of Projects:

- Research of methods used for the evaluation of large amounts of data
- Usable security for IoT
- Development of guidelines, methods and tools for secure IoT-based applications in the areas of automated driving and Industry 4.0

Industry 4.0

Industry 4.0 is the introduction of cyber-physical systems and the interconnectedness of machines and processes in the industry using Internet technologies. Virtualisation and the Internet of Things are further basic principles of Industry 4.0. One task of this subject area is the planning of digital product memories which cover the entire product life cycle.

Examples of Projects:

- Use of Artificial Intelligence (AI) methods to improve production planning for Industry 4.0
- Introduction of a secure development cycle for cyber-physical production systems

Industrial Security

Industrial Security deals with the cyber security of industrial plants. The increase of networking and automation leads to a growing number of new potential points of attack. This is as true for the area of general cargo production as it is for liquid bulk cargo production. One essential aspect is the continuous monitoring of operations for the timely detection of network traffic anomalies. Machine learning methods play a crucial role in this process.

Examples of Projects:

- Detection and defence against cyber attacks on digitalised distribution networks of the power supply
- Safety of transformer stations
- Security of cyber-physical systems

Data Science

Data Science deals with the evaluation of large amounts of data („Big Data“) for the purpose of obtaining new and innovative information. This concerns different areas of application and includes different methods of machine learning (statistical and structural methods).

Examples of Projects:

- Analysis and evaluation of long-term EEGs of patients suffering from epilepsy

Any questions?

For further information, please contact FH-Prof. Mag. Dr. Simon Tjoa.

Our project partners

- Austrian Institute of Technology
- Kapsch BusinessCom AG
- Salzburg Research Forschungsgesellschaft mbH
- SEC Consult Unternehmensberatung GmbH
- Christian Doppler Labor SQL.AT - Vienna University of Technology
- SBA Research
- Medical University of Graz, Group HCI-KDD