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FRAUNHOFER INSTITUTE FOR COMMUNICATION, INFORMATION PROCESSING AND ERGONOMICS FKIE

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Cover - nexusplexus/123RF
P. 3 - Uwe Bellhäuser
Graphics - Fraunhofer FKIE

Date of Information 07/2019

RESEARCH FOR DEFENSE AND SECURITY

YOUR TRUSTED RESEARCH PARTNER BEHIND THE SCENES

The Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE is the strategic partner for the German Armed Forces, security agencies and organizations, as well as for industry and service providers. As the leading institute for applied research and practical innovation for information and communication technology we pursue the common goal of early identifying, minimizing and mitigating existential risks.

For the Fraunhofer FKIE, research for defense and security is more than just a task to be performed in the course of developing technologies and processes. Reliable and faithful support of civilian and defense-technology partners in command and reconnaissance processes represents a challenge, an opportunity and a mission at the same time for the Institute's roughly 500 employees.

As a research institute, the Fraunhofer FKIE actively contributes to securing freedom of action for its collaboration partners and thus all areas of security in Germany: on the ground, in the air, at sea, under water and in cyberspace. In so doing, the institute's scientists view the entire data and information processing chain: from collection, transmission and processing to user-focused application and reliable protection.

»As a provider of research services, we support our partners with solutions that address existential risks.«

Research at the institute focuses on improving the performance of cyber-physical systems. The focus is on further development of information technology systems with regard to usability, data security, interoperability and networking, as well as evaluation of available information with high precision and reliability. Artificial intelligence methods are a key part of this work and are developed and employed in an application-oriented manner at the FKIE.

The »human factor« is always of central importance. In the development of effective and efficient human-machine systems, the user remains the pivotal factor and, as the decision-maker, also the ultimately responsible agent.

The scientists at Fraunhofer FKIE are researching in five key areas in which they have built up extensive domain expertise:

- **I** Information collection, and support for decision makers and commanders
- **II** Protection and freedom of action in the cyber and information space
- **III** Aviation and space
- **IV** Maritime systems
- **V** Land systems

Our research services range from studies and tests to prototype development. Nine different departments with complementary core expertise ensure that the institute has a broad interdisciplinary base and is able to offer systemic solutions. Each department conducts its research and development to the high scientific standard for which the name Fraunhofer stands.

As a reliable strategic partner for domestic security, the Fraunhofer FKIE confronts current scientific and technological challenges on a daily basis - with broad-based expertise and excellence in detail.

OUR RESEARCH PROFILE

»We work every day to make the world a safer place.«

MMS HUMAN MACHINE SYSTEMS

This department is specialized in the clear and transparent presentation of complex technologies and processes and in the design of the interactive environment between people and technology that is both time- and stress-resistant. It focuses on ergonomic system analysis of human-machine systems and the conceptualization and user-centered design of interactive interfaces.

ITF INFORMATION TECHNOLOGY FOR COMMAND & CONTROL

The ITF department develops architectures and interoperability solutions for distributed command information and decision support systems. Its mission is to develop innovative solutions for the command and control of networked operations with the aim of creating information superiority for the German Armed Forces and civil security agencies and organizations.

KOM COMMUNICATION SYSTEMS

KOM conducts conceptual and experimental research on the efficient use, reconnaissance and jamming of communication systems. Its research activities are based on tactical deployment scenarios in a multinational environment and the requirements of the German Armed Forces arising from networked operations.

SDF SENSOR DATA & INFORMATION FUSION

»Sensor Data and Information Fusion« pulls together heterogeneous, complementary information from different sources to achieve an improved situational picture and an understanding of underlying phenomena. It thereby creates the basis for effective interaction between people and the technical systems that support them.

SE BALANCED HUMAN SYSTEMS INTEGRATION

»Balanced Human Systems Integration« brings together user-centered approaches with technology-focused perspectives to create a coherent link between people, complex technical systems and processes. The aim is a user-oriented, balanced and holistic design as well as the control and minimization of the existential risks associated with these systems.

USABLE SECURITY AND PRIVACY USP

»Usable Security and Privacy« deals with the human factor in IT security, evaluates the usability of security technologies and develops methods to protect privacy. Its research aims to improve existing systems and develop new concepts, particularly for developers and administrators.

CYBER ANALYSIS AND DEFENSE CA&D

CA&D is committed to protecting critical systems and infrastructures against cyber-attacks by analyzing vulnerable systems, securing proprietary systems and infrastructures and analyzing cyber-attacks, attacker tools and actors. CA&D thus makes a valuable contribution to protecting against cybercrime, espionage and sabotage.

CYBER SECURITY CS

The CS department focuses on analysis of attack techniques and the development of detection and defense approaches. It also investigates and tests the invulnerability or vulnerability of protective measures - particularly in networked environments where IT has only recently been introduced, such as smart buildings or the Internet of Things.

COGNITIVE MOBILE SYSTEMS CMS

This department investigates scientific topics related to the guidance of mobile single- and multiple-robot systems. Using methods for spatial sensing of the environment and intelligent control and planning procedures, it enhances the semi-autonomous action capabilities of robot systems. The goal is to achieve a purely supervisory control of multi-robot systems.