# Soft Busters

Safe, secure and stable software for the Internet of Things

We have been working on developing and upgrading complex software for embedded systems for many years. In the automotive industry, two "S's" are of paramount importance: safety and security. Our solutions are safe and guarded in the best possible way against hacking attempts (secure). Countless customer projects demonstrate that IAV reliably delivers first-class quality in security-critical systems. We also offer our competency and expertise to clients from industry where many decades-old systems are still in use that no longer come up to state-of-the-art software. This is often the case in areas, such as plant control systems, automation systems, databases and public services IT solutions.

Constant changes and upgrades as well as poor documentation often make it almost impossible to keep on top of programs, resulting in software systems malfunctioning or crashing. And start-ups are also frequently challenged by the fact that new products have not been tested properly when they are launched, causing many problems in use. Unlike large enterprises, they do not have the resources to thoroughly test new software in advance. IAV can analyze, maintain and modify existing software, and add new interfaces to it. If need be, we also do this using older-type tool chains – provided they are still available. However, we are also in a position to reprogram an entire system and, in this way, configure a stable, safe, secure and future-proof architecture.

IAV has gathered over 30 years of automotive engineering experience with complex systems, while also advancing numerous digital tools and methods. We are now making this expertise available to our customers from industry – e.g. for the Internet of Things (IoT). At IAV, we have mathematicians, data scientists, IT specialists and control engineers working on solutions that meet the needs of our customers in an optimum way. If projects so demand, we also work with leading solution providers.

IAV GmbH
Carnotstrasse 1 · 10587 Berlin · GERMANY
softbusters@iav.de
+49 30 3997-89375
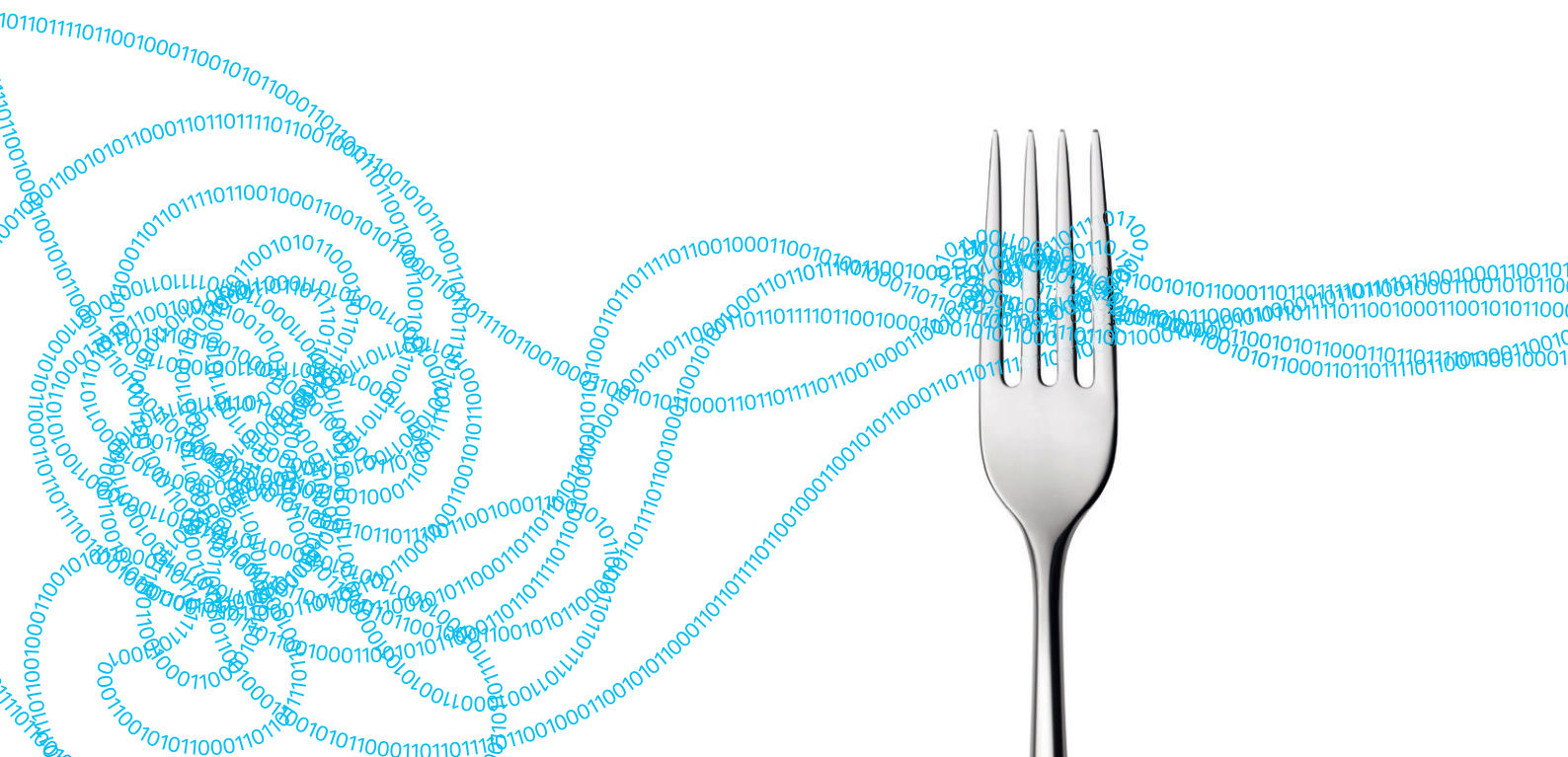
Digitalization of Industrial Technology

Microcontroller, programming languages and tools

IAV has experience with virtually all microcontrollers used in industry and works with the full range of programming languages, such as C, C++, Java, JavaScript or Python. We use Matlab / Simulink for model-based software development and automatic code generation. We conduct static and dynamic code analyses and software modeling with the help of tried and proven tools, such as Polyspace from MathWorks and Enterprise Architect from SparxSystems. Added to these are proprietary tools like prototyping and testing.

Confidentiality is always guaranteed

To extend the functions of existing software, we need documentation, with a description of interfaces sufficing in many cases – guarding business secrets. However, access to source code is necessary if we are asked to completely analyze, clean up und re-configure a solution. But, in this case too, we guarantee that your confidential information is completely protected from unauthorized access.

Model-based development

The model-based approach to system development enables IAV to make sure that in spite of the potential growth in complexity, number of failure modes and possible unintentional consequences in software-based systems, priority is given to ensuring safety, security and reliability. This is achieved by verifiably covering requirements, all backed up by test cases, automated testing and test management, analyzing architecture and design at system level as well as by the capability of checking a system using simulation (hardware, software, cyber physics).

Successful client projects

Clients from all sorts of industries have already benefited from our experience. For instance, IAV has analyzed the control systems used in existing wind turbines and developed a brand new architecture for the control software. Established concepts have moved in from the automotive environment, such as model and version management, pronounced modularity in software units and a clear segregation of application software from the hardware-embedded functions.

We have also demonstrated our expertise in deep-drilling technology. For instance, one drill head currently uses a network of various control units to record measured values or provide navigation underground. Based on many years of experience with diagnostic concepts in the automotive industry, IAV is adding a structured fault detection and debugging capability to the existing drilling system. In the event of component failure, systematic countermeasures, such as limiting operation, can keep the system running while reducing expensive downtime.