Digitally Networked and Secure!

It is simply a matter of course for more and more people to use their smartphone to write to friends or to watch television on the Internet. The Internet is part of our society—on both a small and large scale. Without the Internet we would have no modern hospitals, no reliable supplies of water and electricity, no modern banking system. Internet security is essential. This is why the Federal Ministry of Education and Research has been supporting research projects for several years now. What is more, top researchers have come together in three large centres in Saarbrücken, Darmstadt and Karlsruhe to develop new solutions for greater Internet security.

These researchers are involved in a close dialogue with members of the public in forums and at crypto-parties. The new research framework programme 'Self-determined and secure in the digital world' describes the measures which the Federal Government is taking to study security concepts so that we will all be able to use the Internet safely in the future.

Federal Ministry
of Education
and Research

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# Research for greater security on the Internet

Increasing connectivity is making critical infrastructures such as electricity and water supplies more and more vulnerable. Cyber-attacks are becoming increasingly frequent. At the same time, people have less and less control over what is happening to their personal data in the Internet.

With the 'Self-determined and secure in the digital world' programme, the Federal Government is investing in research into new effective tools and methods. The idea behind the research programme is to ensure greater protection for people and data in the digital world.

Prof. Dr. Johanna Wanka
Federal Minister of Education and Research

Research protects my data
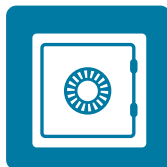
To a certain extent we can take precautions individually to ensure that our data is secure on the Internet: by regularly changing our passwords, activating anti-virus programmes and firewalls and by keeping the programmes that we use on our tablets, smartphones, etc. up to date.

Protecting data means first and foremost protecting data from unauthorized access by third parties. This is necessary in the case of e-mails, for example, which in principle are no more secure than postcards. Many e-mail programmes already offer encryption tools to protect contents, but these are still underused.

Research ensures greater security for our data: we are improving the programmes that encrypt the data so that they are both easy to use and cannot be hacked.

Research protects against crime

The Internet offers many interesting services. The drawback, however, is that it also opens up new opportunities for criminal activities such as fraud, theft or online harassment. For example, it is often impossible to recognize whether websites which ask for passwords are genuine or whether users are being tricked.

Research ensures that we are one step ahead of fraudsters: Warning systems uncover security gaps and suspicious activities in good time. In cases where criminal activities have already taken place, it is important to find out who was responsible and what damage incurred. Measures to secure and analyse digital footprints help to solve crimes.

## Research protects my privacy

Whether we shop on the Internet or go jogging wearing a smart fitness bracelet, we have to reveal personal data if we want to be able to use helpful online services. But hardly anyone knows who can access this data and for what other purposes it is used.

On the one hand, we are pleased that the Internet provides useful information—about nearby restaurants, for example. On the other hand, we risk becoming traceable and transparent.

Research develops solutions which will help users to decide what data may be collected and how this data may be used. Everyone has the right to self-determination and to a private sphere on the Internet.

Research protects our water and electricity supplies
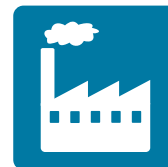
The Internet is not only important for our computers at home. Digital services also ensure that traffic lights operate correctly, that there is always enough electricity available and that vital hospital equipment functions properly. At the same time, these systems are vulnerable and exposed. A hacker attack on the data network of a power utility in a city like Berlin causing a one-hour power failure over mid-day would cost millions of euros in damage. Human lives are at risk if a hospital's emergency power system fails due to a software error.

Research ensures robust systems that are secure so that important areas such as transport, the health system, energy supplies or public authorities can function properly at all times and are protected against sabotage.