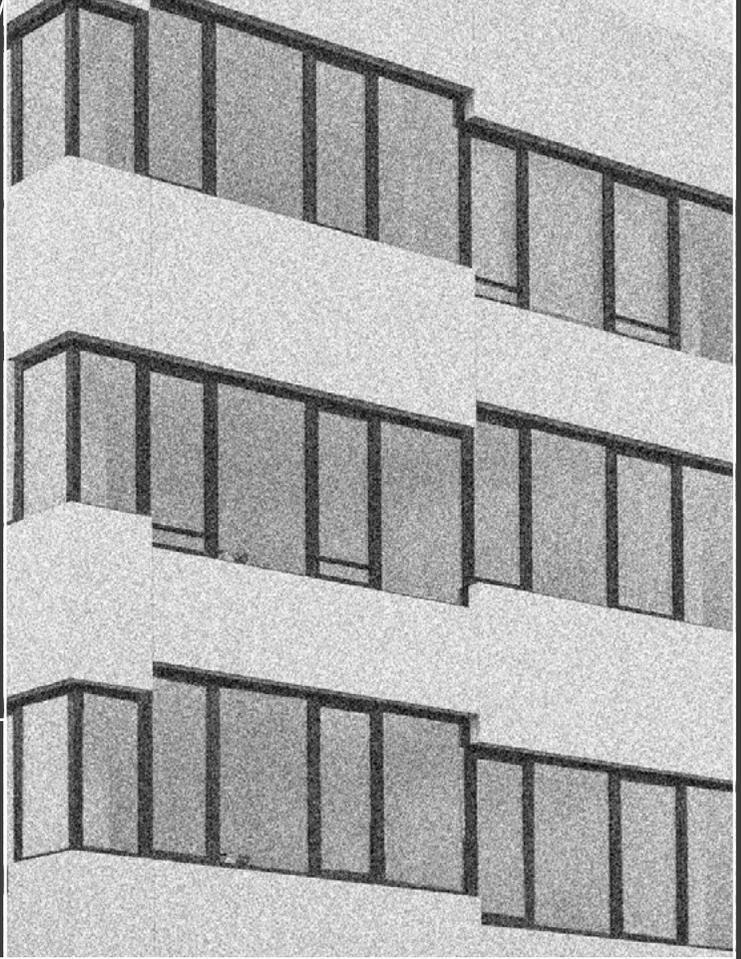


# CISPA



# ZINE 1

English Edition

# DEAR READER,

Ten years ago, today's *CISPA - Helmholtz Center for Information Security* consisted of just a dozen people and a handful of offices. Back then, I could never have imagined how it would all develop. Nowadays, more than 350 people from all over the world are conducting research and working here – and that figure is still on the rise.

Our number of faculty has grown to 31 since we have become a full member of the Helmholtz Association in 2019. These scientists all have come to Saarbruecken from renowned research institutions, demonstrating the importance of our research location already today. Meanwhile, *CISPA* is the global number one for cybersecurity, as the *CS rankings* list us ahead of many well-known international research institutions. With this cutting-edge research and projects such as the *CISPA Innovation Campus*, we also want to be – and will be – the driving force behind structural change in our region and beyond.

Growth always means change. Unfortunately, not every change is positive. We sadly had to say goodbye to our former administrative director Bernd Therre, who passed away in September. He played a decisive role in shaping the development of the center in its early years.



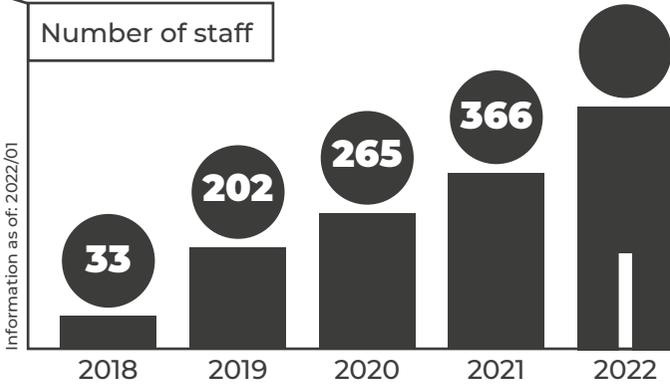
Prof. Dr. Dr. h. c. Michael Backes © Peter Kerkrath

Everything keeps on changing. To make sure that everything happening at *CISPA* remains visible, we now have the *CISPA Zine*. Every three months, we report on our cybersecurity and AI research and the people behind it – from science to administration.

Enjoy reading!

Prof. Dr. Dr. h. c. Michael Backes

# FACTS ABOUT CISPA



**38**  
Nationalities  
at CISPA

- Albania—Austria—Bangladesh—Brasil—
- Bulgaria—Burkina Faso—Canada
- China—Colombia—Cyprus—Egypt
- France—Gambia—Germany—Greece
- Hungary—India—Iraq—Iraq—Israel—Italy
- Jordan—Lebanon—North Macedonia
- Malaysia—Netherlands—Pakistan
- Palestine—Poland—Romania—Russia
- South Korea—Sweden—Switzerland
- Taiwan—Tunisia—Turkey—Vietnam

Age distribution  
at CISPA



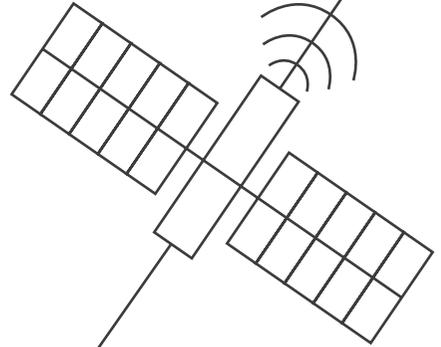
**29**  
is the age  
average at CISPA

# CISPA KEEPS GROWING:

Like the years before, 2022 is marked by the Covid pandemic, limiting our everyday lives. At *CISPA*, we are not letting this stop us: our center is growing and growing – not only beyond the borders of Saarbruecken, but also beyond the borders of Saarland.

In Hanover, Prof. Dr. Sascha Fahl is setting up the first *CISPA satellite* in cooperation with *Leibniz University* and the state Lower Saxony. In the coming years, scientists will conduct research there on industrial security and user-oriented cybersecurity. The new *CISPA* faculty Sascha Fahl is starting off with his research group. In the future, the *CISPA satellite* – as not only Fahl calls the dependent branch in Lower Saxony – is to grow many times its current size.

Our last hiring season was very successful. In addition to Sascha Fahl, nine other excellent scientists from top institutions such as the *University of Maryland*, *Harvard University* and *ETH Zurich* were recruited to advance their research in Saarbruecken and expand our research areas. However, the increase in personnel is by no means limited to the top scientific staff. Every month, new employees join us and enrich the center in scientific and administrative areas.





Our initial building has long-since become too small for the now 366 employees. Offices at the *Beckerturm* in St. Ingbert and in the old *Sinn building* in the city center are intended to solve our space issues for the time being. In addition, a unique space for start ups is being built on the *Alte Schmelz* site in St. Ingbert: the *Innovation Campus*. And it's not the only one: a separate campus will be built around the main building in Saarbruecken. In the ideas contest, the design of the *raumwerk* team with *ST raum a. Landschaftsarchitekten* from Berlin was able to convince the jury. A unique and sustainable research environment is to be created by combining urbanity and nature. However, it will be several years before this vision will become reality.

Currently, the huge excavation pit in front of the CISPA main building is still more welcoming to build sand castles than to work, but the first rooms should be ready for use as early as spring 2023. Getting the campus up and running is high on the agenda of our new administrative director, Dr. Kevin Streit. Kevin is a *CISPA* veteran and has long been our administrative manager. He succeeds the first administrative executive director, Bernd Therre, who sadly passed away shortly after his retirement. Asked if much will change with him in the position, Kevin says, "Of course everything will change – but not because of me. We outlined an eight-year growth plan in 2019, and we're just into year two. So there's still six more to come, and with it many more developments and changes. It's a pity that I can't ask Bernd for his opinion anymore." The 37-year-old is looking forward to the new challenges – and the pace at which *CISPA* is growing promises a few more.



# “I CHOSE SCIENCE — MAINLY BECAUSE OF THE FREEDOM”

In October, Prof. Dr. Thorsten Holz began his work at *CISPA*. The newly tenured faculty joined us from the *Ruhr University* in Bochum, where he has been researching and teaching for the past 11.5 years. Leaving his old workplace certainly was not easy for the 40-year-old. In an interview, he tells us why he took the plunge after all – and how his career started in the first place.



Prof. Dr. Thorsten Holz © Tobias Ebelhäuser

**In Saarbruecken, your reputation as an excellent researcher in their field precedes you. What attracted you to research IT security?**

I guess one reason is that I like playing games. As a researcher, you usually try to get past some protective mechanism and thus gain access to things you really shouldn't have access to. That appealed to me even when I was young. In my early days, I may have even tried to bypass the copy protection of video games or turn a demo into a full version. Because I found all this exciting, I then also

chose to pursue studies in computer science. During my studies in Aachen, I got in touch with the *Chaos Computer Club* in Cologne and spent a lot of time there. Together with friends, I started to work on the security of wireless networks, for example. Then I focused on *honeypots* – these are computer systems designed to attract attackers, and I wrote my diploma thesis on this topic. As time went on, I specialized more and more in IT security.

## **Do you still enjoy what you do today?**

Yes, absolutely! After my doctorate, I also had interesting offers from industry. Still, I chose science, mainly because of the freedom researchers enjoy. And IT security is and remains an exciting and diverse subject. What I was doing five years ago is very different from what I am doing today or what I will be doing in 10 years. Research in this area is not monotonous; it is constantly evolving. However, in the past three or four years, I have also been involved in a lot of administrative tasks. I hope to find more time for research again at CISPA.

## **What are you currently researching?**

At the moment, we are mainly working on topics in three areas. The first is software security. Here we are primarily focussing on so-called fuzzing, i. e., the automatic detection of vulnerabilities and corresponding protection mechanisms to make software systems more robust against attacks. One important aspect of this is reverse engineering. This technique is used when you don't have access to the source code – that is, what a programmer has implemented – but can only look at the binary code, that is, what the machine ultimately executes. The second area is the intersection of IT security and machine learning. For example, we have studied so-called

“adversarial examples” that can trick machine learning algorithms for speech recognition. To this end, we studied smart speakers such as *Siri* or *Alexa* and wanted to find out whether and how often they “wake up” and listen in, even though their users have not addressed them at all. The third area is the security of cellular systems, especially LTE. In this area, we have found and practically demonstrated different types of security vulnerabilities.

## **Why did you decide to move to CISPA and what topics of researchers here are connected to your work?**

What ultimately convinced me is that CISPA is to become a very large center that takes a holistic view of IT security with its many facets. But of course, I'm also looking forward to the different environment and the new colleagues. In my research, there are also some overlaps with other CISPA researchers. For example, Andreas Zeller works on software testing, many people work in the area of system security, and Mario Fritz is active in the area of machine learning, just like I am. But also in the areas of usable security and web security, there certainly are points of contact with Katharina Krombholz or Ben Stock.

# MORE GOOD NEWS

Prof. Dr. Andreas Zeller  
© Stephanie Bremerich



CISPA faculty member Prof. Dr. Andreas Zeller won his sixth *Most Influential Paper Award* in 2021. This makes him one of the most influential researchers in the world. "A Most Influential Paper Award impressively demonstrates that one's research has not only been able to generate enthusiasm for the moment, but that the scientific community still sees the work as groundbreaking even after many years," says CISPA Director Prof. Dr. Dr. h.c. Michael Backes.

We no longer only take care of young scientists but now also provide training in administrative areas. On September 1, Sara Starck started as CISPA's first trainee as a prospective office management assistant. She will get to know all departments over the next two years. Welcome Sara!



Sara Starck  
© Tobias Ebelshäuser

A total of 108 papers by CISPA researchers were accepted at IT conferences in 2021, 35 of them at the top 4 conferences in cybersecurity and the top 2 in cryptography. This impacts the *CS rankings*, where we continue to rank first in Computer Security, ahead of some of the most prestigious institutions in the world. Of course, this does not mean our researchers will rest on their laurels, as the first deadlines are already approaching. By the way: CISPA faculty member Cas Cremers, together with Elaine Shi, will be program chair at the renowned IT security conference CCS 2022 this November.



Prof. Dr. Cas Cremers  
© Tobias Ebelshäuser

© Tobias Ebelshäuser



Our first CISPA podcast is online! In TL;DR (short for "too long didn't read") we talk to researchers about their work on cybersecurity topics and artificial intelligence every month – alternating between German and English episodes. The podcast is available on all major podcast platforms.

**Publisher:**  
CISPA – Helmholtz Zentrum  
für Informationssicherheit gGmbH  
Stuhlsatzenhaus 5  
66123 Saarbruecken, Germany

**Editor-in-Chief:**  
Sebastian Klöckner

**Editor:**  
Annabelle Theobald

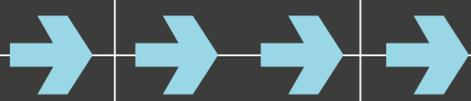
**Design:**  
Lea Mosbach,  
Janine Wichmann-Paulus

**Information as of:**  
January 2022

**Photography:**  
Stephanie Bremerich,  
Tobias Ebelshäuser, Peter Kerkrath

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# NEUE FACULTY



# 2021



**Sebastian  
Stich**

Sebastian Stich joined us from *EPFL Lausanne* and conducts research on methods for decentralized machine learning. He managed to present 15 papers at top ML conferences within two years. His high quality publications are very frequently cited, resulting in impressive citation statistics.



**Christoph  
Lenzen**

Christoph Lenzen joined us back in July from the *Max Planck Institute for Computer Science*. His research covers the theory and security of distributed systems, including clock synchronization, fault tolerance, and reliable hardware. In addition to various awards, he received an *ERC Starting Grant* in 2017 and an *ERC Proof of Concept Grant* in 2020.



**Rebekka  
Burkholz**

Rebekka Burkholz, previously a postdoc at *Harvard University*, is a trained mathematician in the field of AI and machine learning, especially the application to medical data. For her doctorate, she received the dissertation award of *ETH Zurich*.



**Julian  
Loss**

Julian Loss came to *CISPA* after his time as a postdoc at the *University of Maryland*. He has already received a *Best Paper Award* for his work at the *EUROCRYPT 2021* scientific conference. At *CISPA*, he is working on research questions related to cryptographic protocols and distributed algorithms.



**Thorsten  
Holz**

Thorsten Holz joins us from the *Ruhr University* in Bochum. His research focusses on systems security, for example automated vulnerability assessment and mobile security. Another topic is the intersection of computer security and machine learning. He is a *Heinz Maier-Leibnitz Prize* winner and received an *ERC Starting Grant* in 2014.



**Sebastian  
Brandt**

Sebastian Brandt was a postdoctoral fellow at *ETH Zurich* before he came to *CISPA*. He conducts research on secure decentralized systems and discrete and distributed algorithms. For his work, he received several *Best Paper Awards*. In 2019 and 2020 alone, he published ten high-quality publications.



**Aleksandar  
Bojchevski**

Aleksandar Bojchevski received his PhD from the *Technical University* of Munich. He works on research questions related to trustworthy machine learning, provable guarantees, interpretability, privacy preserving machine learning and machine learning on graph data.



**Karl  
Wüst**

Karl Wüst obtained his PhD at *ETH Zurich* and focuses on security and reliability of blockchain technology. Six of his papers were accepted at the four top-tier security conferences. The impact of his work is impressive: one of his papers has already been cited more than 1000 times.



**Mridula  
Singh**

Mridula Singh received her PhD from *ETH Zurich* on the security of wireless networks and autonomous systems and the security of position information exploitation. Among her numerous papers, her involvement as co-leader of "CSNOW-Network of Women in Computer Science Initiative" is noteworthy.



**Sascha  
Fahl**

Sascha Fahl is a professor at *Leibniz University Hanover*. He is setting up the first *CISPA satellite* in Lower Saxony. His research focuses on behavioral and user-centered cybersecurity. In addition to numerous awards, Fahl has also received the DFG's *Heinz Maier-Leibnitz Prize*.