Deutsches Forschungszentrum für Künstliche Intelligenz
German Research Center for Artificial Intelligence

dfki ainext

AI as a Transformer

How Artificial Intelligence is Connecting Science, Business, and Society in New Ways

Human-Centric AI

Intelligent solutions for the knowledge society

DFKI has more than 35 years of experience in human-centric AI, conducting research in key areas of basic research and future-oriented applications, while always maintaining a focus on social relevance and scientific excellence in the field of artificial intelligence.

The German Research Center for Artificial Intelligence (DFKI) was founded in 1988 as a non-profit public-private partnership. It operates facilities in Kaiserslautern, Saarbrücken, Bremen, Lower Saxony (Osnabrück and Oldenburg), Darmstadt, with laboratories in Berlin, Lübeck, and a branch office in Trier.

It supports 29 research areas, ten competence centers, and eight living labs. Based on application-oriented research, it develops product functions, prototypes, and patentable solutions in the information and communication technology (ICT) sector. Funding is provided by public funding sources and industrial development contracts.

Project results and milestones are periodically reviewed institutionally and by a Scientific Advisory Board, an international panel of experts. In addition to the Federal Ministry of Research, Technology and Space (BMFTR) and the federal states of Rhineland-Palatinate, Saarland, Bremen, Hesse and Lower Saxony, several leading German and international high-tech companies from a wide range of industries also have seats on the board.

www.dfki.de

AI as a transformer – Outstanding research for tomorrow's economy

The German government's High-Tech Agenda identifies AI as a vital technology for the future and, the aim of its AI strategy is for AI to be responsible for ten percent of Germany's economic output by 2030. To achieve this goal will require bold investment in computing infrastructure and a strong research focus on knowledge transfer.

When research results appear not only in trade journals, but also in production halls, logistics centers, and medium-sized companies, theory has become innovation and AI has become a cornerstone of growth and profit. On the basis of our application-oriented basic research, our results are already up and running to develop product functions, prototypes, and patentable solutions. The feature topics in this issue represent our diverse transfer projects, i.e., Yield Consortium, Carve-DL, ESCADE, PAIRS, Open6GHub+ as well as our activities in the field of biomedicine.

Germany is unique in combining scientific expertise, a strong industrial base, and a broad range of small and medium-sized enterprises – ideal conditions for close linkage between science and industry. DFKI promotes transfer through joint research projects, open innovation platforms, and TransferLabs. In this issue's interview, my colleague Prof. Andreas Dengel and I discuss why DFKI is a valuable partner for companies in the AI transformation and what the collaborative possibilities are to work together with DFKI.

With our diverse industrial partnerships, we create a cycle in which science provides the impetus, industry scales it up, and both sides learn from each other. In this way, AI is not an end in itself, but a means to an end, an AI "transformer" helping to make Germany fit for the future.

Prof. Dr. Antonio Krüger
CEO

Yield Consortium: Accurate harvest forecasts with satellite data and AI

Agricultural yields can be significantly impacted by environmental factors and uncontrollable events. It is rarely possible to predict harvests with absolute certainty. However, this uncertainty is now being turned into assured certainty by the Yield Consortium at DFKI. An AI-supported technology platform there analyzes multispectral satellite data to generate precise and reliable harvest forecasts – months in advance.

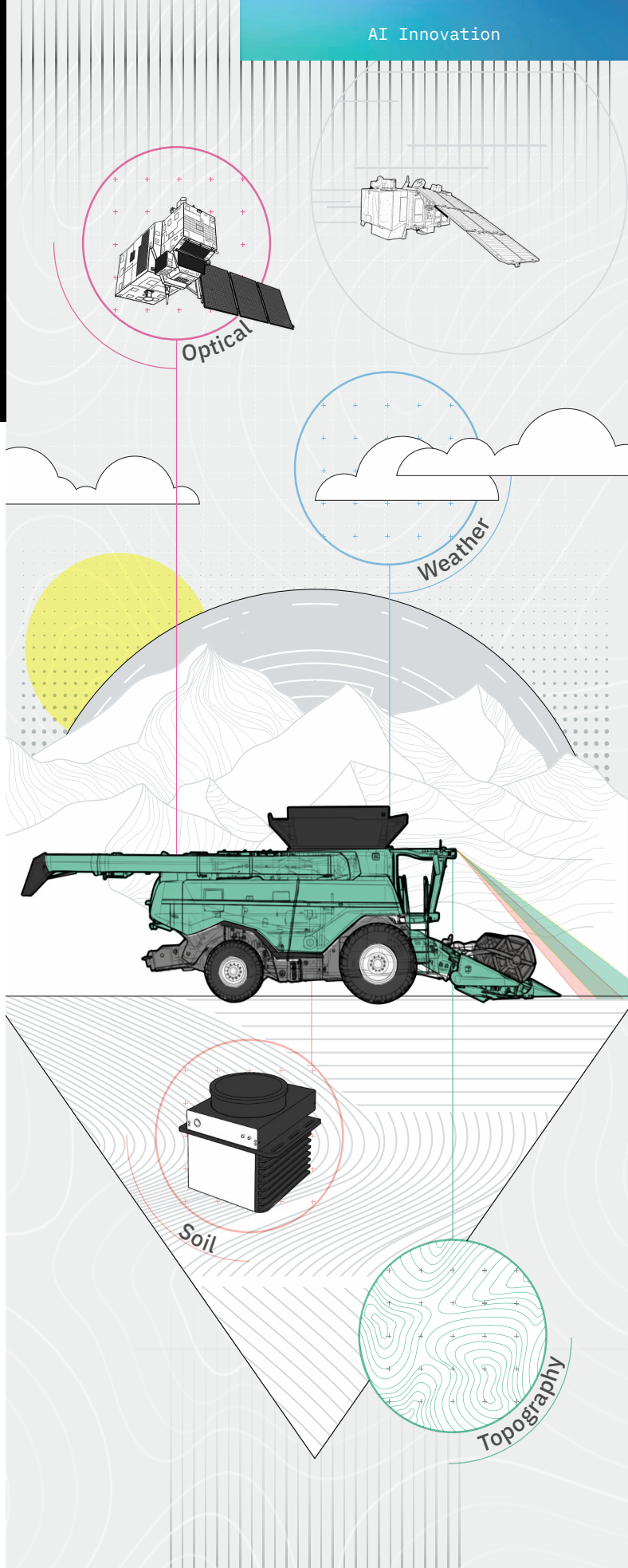
From satellite imagery to forecasts

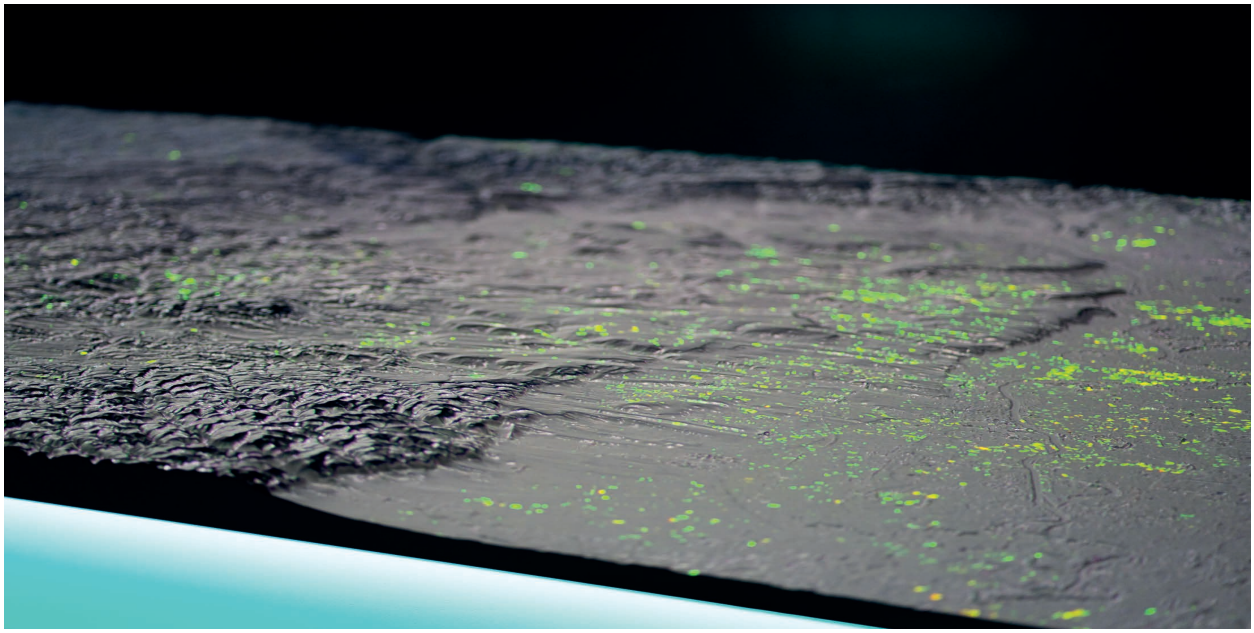
Farmers often face the challenge of having to make decisions under conditions of great uncertainty. The soil is prepared, the seeds are sown — and then, all that remains is to wait. AI is fundamentally changing this pattern: the Yield Consortium uses systematic images from Sentinel-2 satellites from the European Space Agency‘s Copernicus program, whose high-resolution multispectral cameras capture images of the Earth‘s land masses every five days.

„ The Yield Consortium demonstrates how complex satellite data and AI-based analytics are used to generate reliable harvest forecasts, giving farmers and the entire value chain far more planning certainty and stability.“ *Prof. Andreas Dengel*

Data diversity for better accuracy

Satellite imagery forms the core of these analyses. They are supplemented by weather data, soil quality maps, topographical information, and historical crop data. AI is able to identify complex relationships between environmental factors and plant growth. Test results show a forecast accuracy of over 90% for wheat crops in the US — almost perfect agreement between forecasted and actual yield.





„ Yield modeling in conjunction with BBCH and LAI modeling is a complementary component of crop modeling. BASF Digital Farming GmbH has a strong interest in the diverse yield modeling approaches developed by the Yield Consortium.“ *BASF*

AI reveals the invisible

A specially developed model classifies different crops and forecasts the expected yields. Comparative data from agricultural machinery confirmed the results. The field, but also the entire region is made more transparent: is there a bottleneck somewhere, or where can overproduction be expected?

Added value for agriculture and society

Accurate forecasting not only helps farmers plan their operations more efficiently, apply targeted use of resources, and minimize risk. The impact is more far reaching as aggregated data supports food security, trade strategies, and climate adaptation — locally, regionally, and globally.

Research meets industry

The Yield Consortium brings together science with industry partners such as BASF Digital Farming, John Deere, and Munich Re. Close collaboration ensures that findings do not remain in the laboratory, but flow directly into practical applications.

„ The combination of expert knowledge from various industries, from agriculture to insurance, with DFKI‘s outstanding data science expertise proved to be very constructive. Together, we were able to improve the predictive power of previous models.“
Jürgen Wendlandt, Head of Data bei Munich Re

Knowledge clearly communicated

The accompanying video illustrates the path of satellite data flowing into AI analysis to provide on-site forecasts. It shows how abstract data is used to create tangible added value for agriculture and industry.

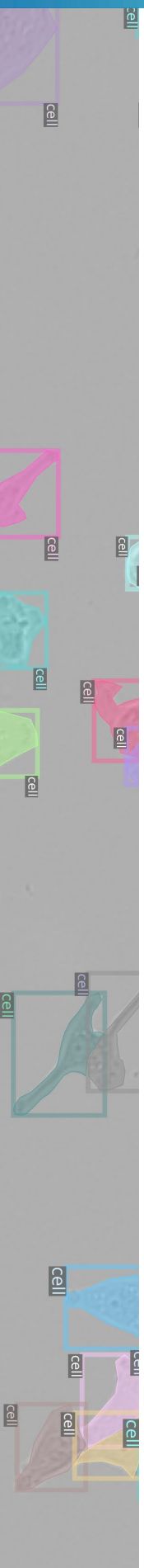
Outlook: data-driven farming

The interaction of AI and Earth observation systems creates added value in the agricultural sector. Our AI technology platform has a modular design that enables flexible transfer to other cultures and regions and paves the way for application development beyond agriculture, for example, in climate observation and urban planning.

Prof. Andreas Dengel is Executive Director at the German Research Center for Artificial Intelligence (DFKI) in Kaiserslautern and Head of the Smart Data & Knowledge Services research department. His research in artificial intelligence focuses on a wide range of topics, including machine learning, image processing, knowledge services, and semantic technologies.

Andreas Dengel‘s experience allows him to serve as an intermediary between research and application, facilitating the transfer of innovative AI technologies to various areas — from manufacturing to climate and terrestrial monitoring, to medical and societal challenges. Teams at DFKI under his leadership develop smart solutions able to analyze complex data sets to discover new insights. This interdisciplinary approach makes him a key spokesperson for the responsible use of AI in science and industry.

Prof. Dr. Prof. h.c. Andreas Dengel
Executive Director
at DFKI-Kaiserslautern



AI in Biomedicine: Insight into the building blocks of life

Artificial intelligence is fundamentally changing biomedical research: it is bringing previously hidden insights about the human body to light. Thanks to AI, medicine is becoming more individualised, effective and cost-effective, with new therapies, customised medications and preventive measures. At DFKI in Kaiserslautern, our team demonstrates how interdisciplinary research and practical knowledge transfer work together to gain innovative medical insights and save lives.

Understand complex data and create knowledge

The heterogeneity and complexity of biomedical data pose a major challenge. The data comes from different sources, is often unstructured, and is prepared in different formats that use inconsistent terminology. That is why Dengel's team, in cooperation with DFKI spin-off intelligentX GmbH, has built up extensive knowledge graphs that map hundreds of millions of links between genes, proteins, drugs, and diseases. AI searches these graphs and billions of cross-links to reveal unexpected patterns and connections. Explaining and understanding complex medical relationships achieves the necessary transparency, while discovering completely new associations.

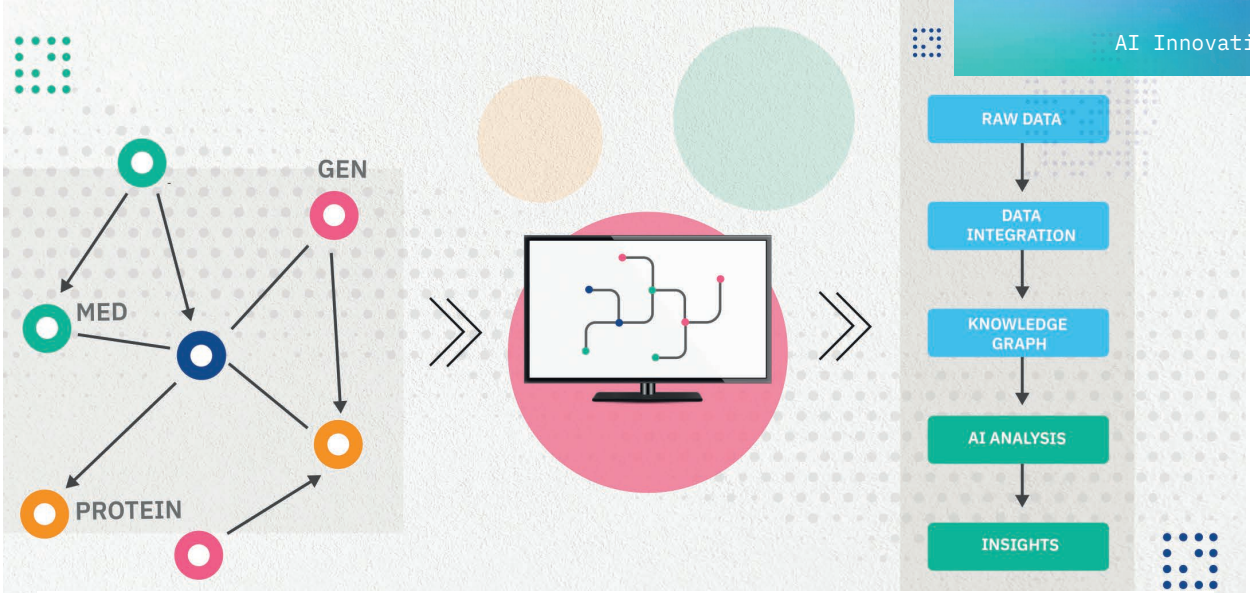
These large knowledge graphs are a core component of highly trained AI systems specialized for various tasks in diagnostics and drug development. Such graphs not only ensure accurate analyses, but also guarantee plausible results. This, in turn, generates trust and acceptance while enabling the fine-tuning of the models and further insights into medical processes and dependencies.

„ Transparency is particularly important in medicine. An understandable explanation of why the AI system recommends a particular therapy or drug and what side effects can be expected is critical. The real added value is only created when the physician understands the decisionen, kann daraus ein echter Mehrwert entstehen.“ *Prof. Andreas Dengel*

Research meets application

Dengel values close cooperation with partners from industry and medical technology to ensure that the AI platform for biomedicine generates real world benefits. His methodology allows the development of technologies in a way that is precisely tailored to meet practical requirements and quickly results in realistic applications.

„ Such collaboration is an integral part of our work. It is the best way to conduct research that is closely aligned with the actual challenges facing the industry, to gain new insights, and to work with experts from other disciplines in developing effective solutions.“ *Prof. Andreas Dengel*



Schematic representation of the knowledge graph: A team from DFKI and DFKI spin-off intelligentX GmbH has developed extensive knowledge graphs that link complex biomedical data, enabling AI-supported insights into previously hidden connections between genes, proteins, drugs, and diseases.

This collaboration ensures that technological developments are precisely tailored to practical requirements, leading quickly to realistic applications. At the same time, it provides an ideal foundation for training young scientists to think and act in a technically sound and practical manner.

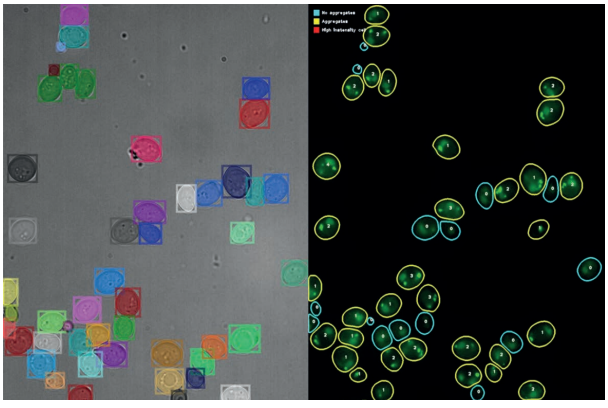
The Transferlabs at DFKI are an important vehicle for implementing such close partnerships. These labs provide a fertile training ground where talented young scientists can think and act in a manner that is both technically sound and application-oriented. Employees from partner organizations work directly on the DFKI research teams on specialized cooperation platforms. Custom-made solutions and prototypes are developed and tested in the protected data room, while staying closely aligned with any scientific advances. The Transferlab, in effect, creates a dynamic exchange that accelerates innovation.

Ethical and regulatory challenges

At the intersection of medicine and artificial intelligence, laws and ethics are indispensable. When working with sensitive patient data, DFKI relies on state-of-the-art privacy methods to protect information in such a way that it is no longer possible to identify individuals. There is also an important need to strike a balance between maximum data protection and rapidly advancing innovation. Inconsistent regulation such as in the European AI Act, currently leads to uncertainty among companies, especially in the healthcare sector. The complex approval process required for AI-supported medical devices represents an additional hurdle. A clear, uniform set of rules would send a decisive signal for investment and faster development.

Chance for personalized medicine

AI is revolutionizing the ability to make detailed, customized therapies for an individual patient. Researchers are able to analyze extensive biomedical data and with new insights, more accurately personalize drug development. The technology promises not only better treatments with fewer side effects, but more efficient drug development overall. Initial successes can already be seen in the discovery of new biomarkers and in the precise prediction of drug effects. The goal is personalized, transparent medicine that reaches many people and significantly improves the quality of life.



PAIRS: Proactive crisis management with AI

Companies that use Artificial intelligence are not only more efficient, but also more resilient. Researchers in the PAIRS (Privacy-Aware, Intelligent and Resilient Crisis Management) project are developing a platform for efficient, data-based crisis management. The research team developed several AI-based smart crisis management services to identify crisis scenarios more quickly. The AI services provide decision-making bases for companies, governments, health organizations, and civil protection agencies, enabling them to proactively manage crises.

Prof. Dr.-Ing. Wolfgang Maaß
Head of Research Department
Smart Service Engineering

Beyond the project:

The Smart Service Engineering research group led by Professor Maaß at DFKI in Saarbrücken develops solutions for the systematic design and development of smart service systems, addressing the intersection of technical and business management issues.

Transparent supply chains

In the domains of production, logistics, and supply chains, organizations use the “Hidden Problem Detector” module to identify hidden problems and optimize their component-based supply chains. The module provides supply chain transparency using a graph-theoretical approach to analyze bottleneck trends at the component level. This involves automatically converting bill of materials (BOM) data into a knowledge graph and enriching it with additional information, such as price data.

Secure power supply thanks to AI

The “Outage Predictor” forecasts regional power outages in the energy sector, thereby contributing to the resilience of the power supply. AI-based scenario planning in JSON-LD uses patterns based on past weather and power outage data to prepare a knowledge graph showing potential crisis scenarios. This allows regional power outages to be predicted and explained more accurately using the scenario patterns.

Comprehensive crisis and security management thanks to PAIRS

An integrated, proactive crisis management is enabled by technology that covers various domains and features a modular architecture: The platform offers the additional options of identifying crisis signals in social media and news at an early stage (“Social Signaling” and “Newspaper Signaling” modules) and reliably detecting oncoming earthquakes based on seismic sensor data (“REAVER” module).

Thanks to its modular architecture and coverage of different domains, the technology enables holistic, proactive crisis management.

Carve-DL: AI is revolutionizing digital forensics

Precise data reconstruction for more security

Modern forensics relies on digital clues. Criminals, without realizing it, often leave traces behind— for example, when using computers or the internet. To secure such digital evidence, investigators rely on state-of-the-art technologies — including specially trained “data sniffing” dogs that can even detect hidden USB sticks. But what can be done when essential data has been irretrievably deleted? At DFKI, Carve-DL is providing answers and revolutionizing digital forensics.

Rethinking digital evidence

In the digital age, standard investigations quickly reach their limits when analyzing large data volumes if data is only available in disjointed fragments, often in unlinked storage areas. Fragmentation makes traditional data reconstruction methods considerably more difficult. Carve-DL applies the latest deep learning technologies, which include transformer models that are able to precisely reconstruct even small pieces of data to recover information previously considered lost.

> « We see Carve-DL and other AI projects as a sustainable approach to obtaining relevant evidence more quickly – an important building block for efficient and modern police work. »
>
> Dr. Matthias Müller,
> LKA Rhineland-Palatinate

AI brings order to data chaos

Neural transformer models and intelligent analysis methods such as iterative clustering turn scattered bits of data back into usable evidence. These digital traces are virtually impossible to detect using conventional methods. The evidence uncovered by Carve-DL is used to make investigations faster, more reliable, and more accurate.

Practical uses

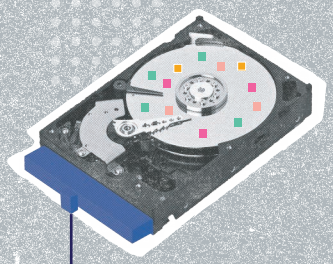
The technology not only helps with police and law enforcement investigations, but also supports companies with data recovery and the protection of digital archives. Carve-DL works closely with security agencies to ensure that research and application go hand in hand. In other words, innovation applied where it is needed.

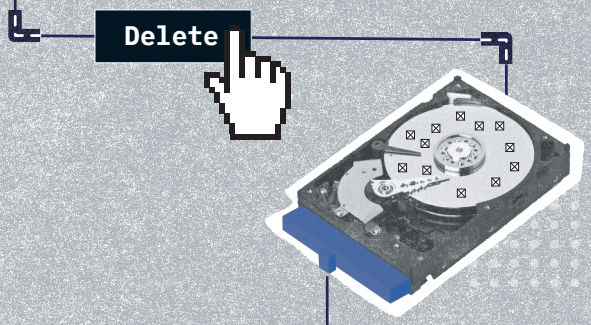
Outlook

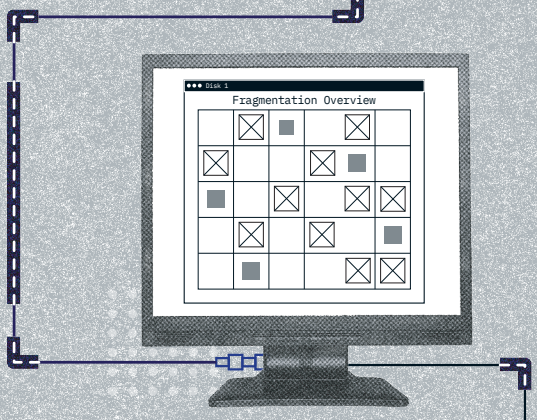
Carve-DL represents a key technology for the digital security of tomorrow. It takes forensics and data recovery to a whole new level, setting new standards as it transforms research and society.

New classification models for identifying file types in raw data improve the recovery process, supplemented by deep learning-based clustering techniques that efficiently identify related file fragment groups.

Data-Recovery

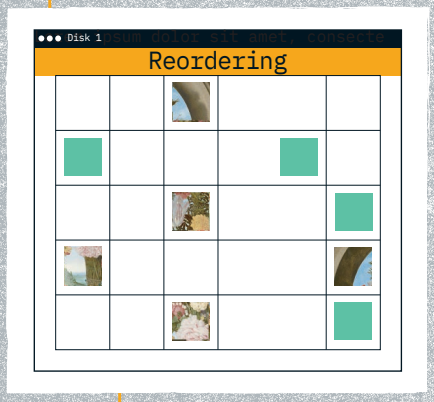






3

An advanced fragment reordering model that already correctly assembles 95% of the reconstructed image fragments

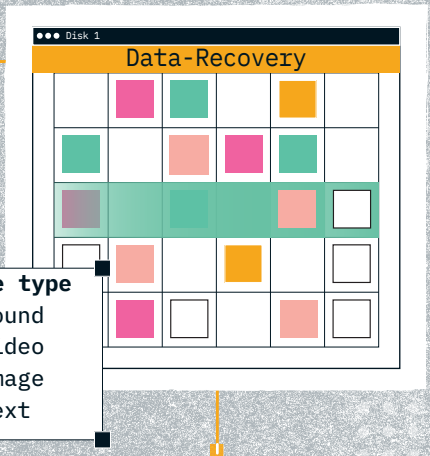


2

A specialised verification model to reliably reconstruct image fragments.

1

New classification models to identify file types in raw data, which improve the recovery process



CARVE-DL

Carve-DL was developed in collaboration with the Rhineland-Palatinate State Criminal Police Office and the Federal Criminal Police Office. As part of the GeT-AI working group led by Dr. Tobias Wirth, DFKI researchers are investigating how modern AI tools can efficiently relieve investigative authorities of their increasingly complex tasks and contribute to improving crime fighting and detection in the long term.

Delete process

Reconstruction process

A network of possibilities: into the networked future with Open6GHub+

DFKI is transforming its research hub into an open transfer center for the next generation of mobile communications. The aim of Open6GHub+ is to make joint research with institutes and universities widely available to companies, other research institutions, and society at large.

Development is extremely complex as different networks have traditionally operated independently of one another — with different frequency bands, systems, and regulatory requirements. Open6GHub+ brings these various systems together in one ecosystem, creating a reliable, extensive, and disaster-proof communications infrastructure.

« We have a wide range of 6G technologies that we are developing with partners from industry for transfer to concrete applications. »

Prof. Dr.-Ing. Hans Dieter Schotten
Head of Intelligent Networks Research and Coordinator of the 6G-Plattform and Head of the Open6GHub+

Industry and society

To reach the full potential of 6G technology, all developments at Open6GHub+ are tested in a practical environment. Together with industry partners, technical systems are jointly tested in open labs in so-called “missions” and applications are readied for market entry from 2030 onwards. The latest generation of mobile communications offers major innovations: these include the integration of intelligent services, innovative network architectures, and the close interconnection of terrestrial and non-terrestrial networks for use with satellites and drones. The aim is to create a more robust, more resilient infrastructure, specifically addressing the weaknesses that 5G leaves unresolved, to guarantee European digital sovereignty.

Many of the current generation’s promises such as high throughput in campus data networks or precision localization have not been fully realized. Many companies and organizations still continue to rely on the proven, older, or alternative systems. Open6GHub+ is closing the gaps with 6G while creating more tangible benefits for the economy and society.

To realistically map the development specifications for 6G, Open6GHub+ applies two main concepts:

1. Missions: Technological goals are specified and implemented in collaboration with partner organizations from industry and society at large. The resulting technological output flows directly into international standards and serves as the basis for new products.

2. OpenLabs: These open laboratories are places for joint development, demonstration, and validation of technologies together with partners from industry and society. SMEs and start-ups also have access and opportunities to contribute here.

AI as the heart of 6G

Artificial intelligence has penetrated all key areas of society and the economy. A modern 6G network creates the foundation for all individuals and organizations to access various AI application technologies. AI makes real-time orchestration of increasingly complex network structures possible, which contributes to more efficient and sustainable use of resources.

6G and AI form a symbiotic unit that benefits all users equally: distributed AI applications running on edge devices in factories, hospitals, vehicles, or in everyday private life as well as intelligent services provided independently through the network. The interaction provides the technology for continuously learning systems – whether care robots, autonomous vehicles, smart environments, or individual assistance systems and serves to flexibly adapt to the needs of all users.

Innovation comes with challenges

The development of 5G taught us that the successful rollout of 6G requires the involvement of politics, business, and the public. Specifically, this calls for education, transparent communication, and opportunities for participation. Through the effective implementation of OpenLabs and the successful missions, Open6GHub+ is making an important contribution to meeting these requirements.

The next generation of mobile communications will not only strengthen the economy, but above all, enrich people's lives. Secure, reliable, and comprehensive networks pave the way for digital participation for all.

6G Platform and Innovation Space

The 6G Platform coordinates accompanying research for all 6G projects funded by the Federal Ministry of Research, Technology, and Space (BMFTR, formerly BMBF). Since its establishment in 2021, it has made a significant contribution to Germany's digital sovereignty.

DFKI bundles its excellent research expertise around the Open6GHub – the current research hub – the new Open6GHub+ transfer center, and the start.smart.connect startup incubator, which provides targeted support and guidance to young companies in the critical start-up phase. This dense network makes DFKI one of the central hotspots for the development and implementation of 6G technologies in Germany.

ESCADE: Sustainable and efficient operation of data centers courtesy of AI

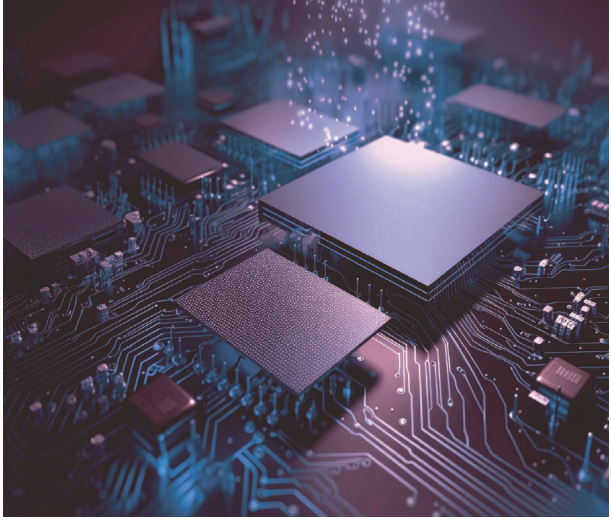
Artificial intelligence has huge potential, but the power consumption by this technology is huge: according to an International Energy Agency (IEA) forecast, the global demand for electricity to power the data centers used to train and operate AI models will more than double by 2030. This is precisely where the ESCADE project of DFKI and Saarland University comes in. The goal is to improve the energy efficiency of AI models by up to 90 percent. Achieving this goal will enable companies to reach their sustainability goals without compromising performance.

Generative AI: powerful but energy-intensive

Large amounts of data are required for natural language processing AI models, such as ChatGPT, Mistral and Claude, and for visual AI models, to reach their full potential. Generative AI models therefore consume a lot of electricity. Even training the models is extremely resource-intensive: some estimates suggest that training GPT-4 consumed 50 GWh, and ongoing operation even demands more energy. According to Sam Altman, ChatGPT needs about 0.34 watt hours to process each query, and OpenAI reports that there are 2.5 billion queries per day. The ESCADE project aims to reduce the size of AI models so companies can use them without compromising performance. If all goes well, the advantages of AI will be accessible to small and medium-sized enterprises as well.

Smaller AI models, optimized performance

The ESCADE project focuses on compressing AI models. One way this is achieved is through knowledge distillation. Here, smaller and resource-saving "student models" are derived from large "teacher models." These do not contain all the data, but only that which is relevant to the specific task. The project results show that this approach can reduce the size of the models by up to 90 percent. The researchers also use the method of "neural architecture search."



While neural networks for AI models are normally designed manually by experts, in this case the AI itself takes on this task: it automatically identifies the optimal architecture for the respective application. The researchers have already achieved promising results, especially with visual AI models, i.e., those that process digital image data. Current project results show that models can also be reduced in size by up to 90 percent in this way.

Hardware updates

In addition to software optimization, the researchers are also focusing on hardware. They are developing concepts for integrating neural processing units (NPUs) into GPU-based data centers. This involves the use of neuromorphic chip technologies. Unlike traditional AI chips, these are based on the structure of the human brain and the way it processes information. The result is chips on which AI models can be operated in an energy-efficient and powerful manner.

One tool, full transparency: EAVE

With the prototype “EAVE - Energy Analytics for Cost-Effective & Sustainable Operations,” researchers have developed a tool that comprehensively monitors data centers and enables efficient and sustainable operation. EAVE forecasts the energy consumption, CO_2 emissions, and operating costs of an AI model and provides an overview of the country and time at which the models can be executed in the most energy- and cost-efficient manner. At the same time, the system illustrates the impact of different AI model configurations and hardware options on performance. This is where various efficiency-increasing strategies can be applied. EAVE supports informed decisions that balance the performance, sustainability, and cost-effectiveness of data centers. Decision-makers can thus manage their data centers in a data-driven, resource-efficient, and future-proof manner. In addition, companies can specifically optimize the ratio of AI performance to operating costs.

ESCADE at Saar Stahl: Specialized AI model provides better sustainability and efficiency

In cooperation with Stahl Holding Saar, the project team from the Smart Service Engineering research area led by Professor Wolfgang Maaß is testing the practical applicability of the research. The aim is to combat scrap shortages by sorting scrap steel so that it can be used to produce new steel. Until now, the company has used a large visual model for scrap sorting. Researchers found a way to make this more compact. As a result, the visual model is not only more energy efficient, but also, in some cases, more powerful. Instead of the large all-rounder model, which consumes a lot of energy, the task is now performed by a small, specialized AI model.

Artificial Intelligence – The engine of transformation

Double interview with Prof Antonio Krüger, CEO DFKI, and Prof. Andreas Dengel, Executive Director at DFKI Kaiserslautern

In which areas of the economy and society is artificial intelligence currently having the greatest transformative impact—and what responsibilities does this entail?

Prof. Antonio Krüger, CEO DFKI:
AI is the cross-cutting technology of our time, comparable to the wheel, the steam engine and electricity. It is revolutionizing processes and opening up completely new patterns of thinking. The potential of this technology can change entire industries, societies, and life's realities for all of us. At DFKI, this means that we must use this power responsibly and – together with partners from science, industry, and society – shape it at an early stage.

Prof. Andreas Dengel, Executive Director DFKI:
Real innovation can only occur when dealing with real problems. We need to understand the context of why or how problems come about before we can get to the root cause of an issue. That is why a key element of our work is to establish close contact with users. Such contact enables us to develop meaningful research projects — scientifically relevant, practical, and applicable.

What is the potential of AI as a catalyst for social change and the creation of new value, and how can this be translated into concrete innovations?

Krüger:
The full potential of AI becomes evident where it addresses societal issues. Whether in healthcare, manufacturing, or administration, AI opens key sectors for the future, for example, the accelerated development of new therapies. It is more than a tool — it is the engine of innovative business models and social progress.

Dengel:
An impressive example is the

repurposing of approved drugs, where the analysis of clinical data, molecular profiles, and publications is enabling the identification of new indications. NLP extracts data from unstructured texts, machine learning recognizes hidden patterns, and simulations test drug-protein interactions. This is where innovation and social benefit come together.

In your opinion, what is needed for AI innovations to have their full impact in practical and economic transfer?

Krüger:
We create trust and innovation by building bridges between cutting-edge research and business. We transform scientific excellence into tangible products and solutions by partnering in over 400 projects in industry and society. However, research alone is not enough. The impact comes about only when innovation is embedded into a social context.

Dengel:
Successful transfer requires joint projects and visible successes — for example, as in our transfer labs where we develop AI-supported solutions for observing cell cultures, modernizing forensics, and ensuring security in the financial world.

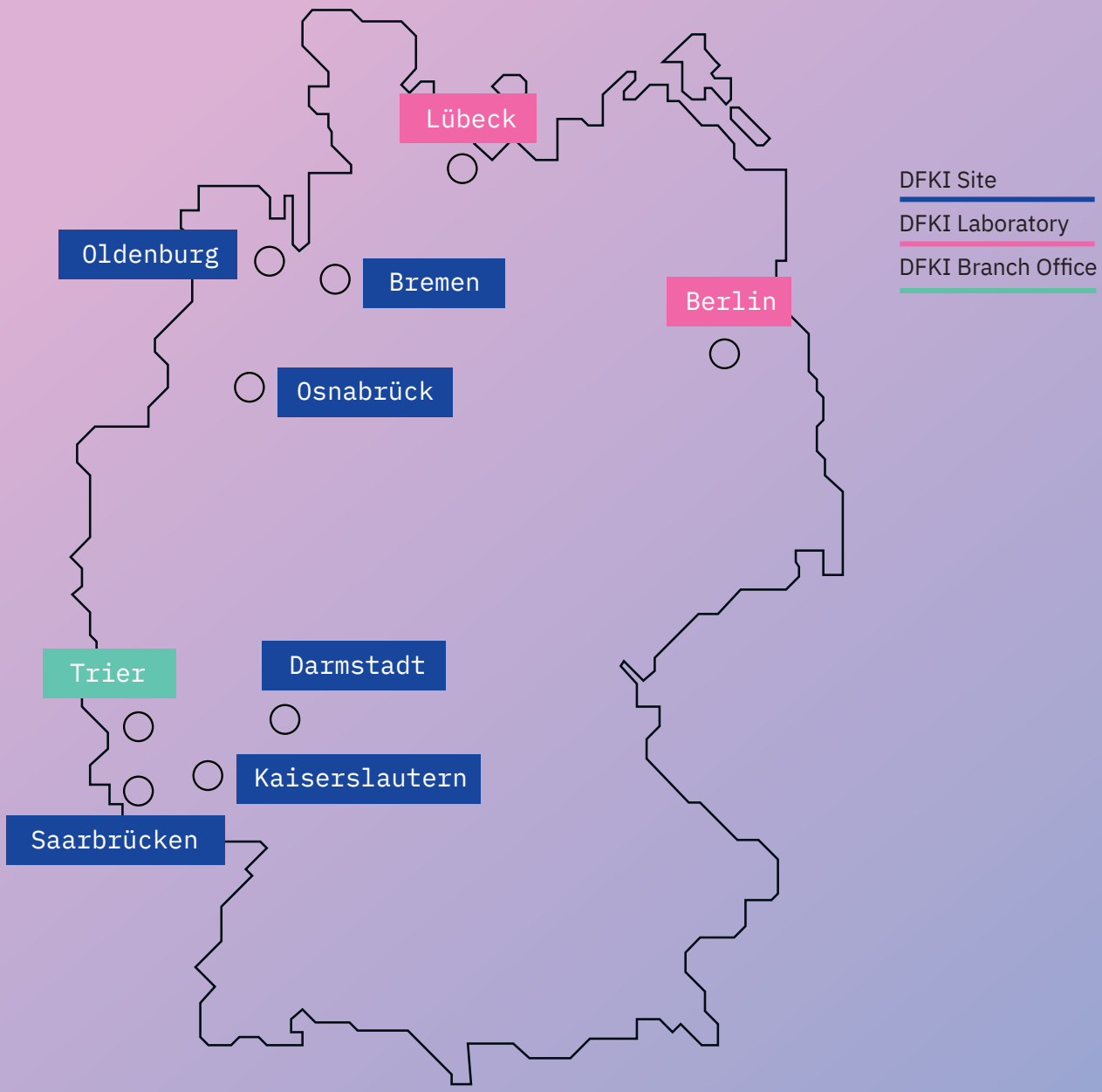
The measurable results of many collaborations strengthen Germany's position as a leader in innovation.

In what ways does DFKI influence economic and social change in its capacity as a research and transfer partner?

Krüger:
DFKI is a major driver of innovation – from robots that work closely with humans to AI systems in healthcare that produce groundbreaking therapeutic success in cases of severe and rare diseases. The measure of our success is how well we use AI to strengthen and transform the society and the economy – by innovative approaches and trusted partnerships."

Dengel:
What's more, we promote the exchange of know-how and Best Practices across national borders and support the training of skilled workers in the field of AI. In this way, we are strengthening Europe's long-term innovative power, ensuring the sustainability of technological progress, and creating opportunities for the societies of tomorrow.

Learn more about how we create real added value with our partners:



Imprint

dfki ai next; Issue November | 2025; **Published by:** : German Research Center for Artificial Intelligence GmbH (DFKI); Trippstadter Str. 122, D-67663 Kaiserslautern; **Phone:** +49 631 20575 0; **E-Mail:** news@dfki.de; **Editors:** Jeremy Gob (responsible), Valentina Röther, Christian Heyer; **Editorial review:** Sandra Antakli; **Layout:** Lando Lehmann, Juan Mejia; **Production:** One Vision Design, Saarbrücken

Credits

Title: DFKI; **Page 3:** DFKI, Oliver Dietze; **Page 4:** ESA/ATG medialab; **Page 5 top:** DFKI, right: DFKI; **Page 6:** DFKI, Lando Lehmann; **Page 7:** DFKI, Felix Amsel; **Page 8:** DFKI; **Page 9:** DFKI; **Page 10:** DFKI, Jürgen Mai; **Page 11:** ai-generated image, Adobe Firefly, Mahmud – stock.adobe.com; **Page 13:** DFKI; **Page 14:** DFKI, Lando Lehmann; **Page 16:** SaymaHossan – stock.adobe.com; **Page 17:** diloomi – stock.adobe.com; **Page 18:** DFKI, Felix Amsel; DFKI, Jürgen Mai; **Page 19:** stocked – stock.adobe.com; **Page 20:** DFKI