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## “AI has found its way into our digital everyday life”

In the automotive industry, artificial intelligence is usually associated with automated driving. And yet, its application already begins in the vehicle development process. At the ATZlive “Components of Future Powertrains 2023” conference, Carina Kießling from strategy consultants Roland Berger discussed the topic in her remarkable impulse lecture entitled “From AI to quantum – will engineers still be needed in the future?” She explains the key points in more detail in our ATZ interview.

**ATZ\_ Carina Kießling, could you please briefly outline the developments that Artificial Intelligence (AI) has undergone in recent years and what its capabilities now are compared to before?**

**KIESSLING\_** AI has developed from being an often neglected research and hype topic to something that has not only

positioned itself as a key technology, but has in the meantime also become firmly established, particularly since the beginning of the 2020s. Disruptive innovative capability has not only been discovered for the business world, AI has also found its way into our digital everyday life and is thus becoming important not only

economically, but also in our private lives and therefore increasingly on a political level.

**What do we need to know about AI and its applications today?**

Artificial intelligence can be divided into a variety of application areas, and these

**Carina Kießling** (born in 1993) has been a member of the Advanced Technology Center at strategy consultants Roland Berger since 2022, where, in her role as Senior Project Manager, she advises clients on Quantum Technologies, Photonics & Optics, in particular in the high-tech sector of the automotive industry, the microelectronics industry, and the chemical industry. In addition to a Bachelor's and Master's degree in physics from Johannes Gutenberg University in Mainz (Germany) and Université Pierre et Marie Curie in Paris (France), she also completed an eMBA at Hult International Business School in Cambridge (USA). Before embarking on her career in consultancy, she worked in research for the German Aerospace Center (DLR).



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can be subdivided into six core categories with regard to their use in the automotive industry: natural language processing and voice recognition, computer vision, including such things as virtual reality and augmented reality, robotics, planning and optimization, knowledge management, and knowledge processing. Although AI now seems to be on everyone's lips as a new and very rapidly growing field, it wasn't all that long ago that AI actually started to be recognized and, in particular, actively used in the automotive industry. Applications such as ChatGPT, which are making AI accessible to a broader group of people, are promoting the understanding that AI is not just something for the future and that the time has come to deal with it more closely. As far as growth figures are concerned, AI offers huge potential for growth. While the global share of AI in the automotive industry was estimated to be around 3 billion euros in 2023, the average annual growth rate is expected to increase by 30 % to around 7.5 billion euros by 2028, according to predictions by our Roland Berger Automotive expert team. Funding for AI programs from the government and businesses is seeing similar increases, as shown, for example, by the 180 million euros of funding provided within the framework of the "EU AI Acts". Investment in AI by the automotive industry shows the increasing interest of the private sector and demonstrates both diversification and a belief in the application of AI and its long-term success. For example, over the past ten years,

15 billion euros of investment has been made by the private equity sector alone for 250 AI start-ups in Germany, each of which received more than 1.5 million euros.

#### **To what extent is AI being used in vehicle development today?**

AI in the automotive industry is for the most part always associated with the topic of autonomous driving. But AI can be much more than a driver of mobility solutions for the future. I can give you three examples: firstly, the evolution of technical drawing, which was still work-

### **“AI is not able to make decisions by itself”**

ing with pen and paper until the 1980s and whose job was then transformed with the introduction of AutoCAD and Unix workstations, before ultimately turning to 3D-based cloud CAD applications with computer vision. As a brief explanation: we use the term computer vision to describe when a computer uses data to identify objects, for example for facial recognition or the use of VR glasses, or for augmented reality applications in which objects are embedded in a digitally created 3D world. This enables us to create innovative R&D solutions, support smart factories, or radically modernize the topic of digital after-sales. Secondly: in retrospect, supply chain management and process optimization in the automotive industry often

failed because simulation was too computer-intensive and data quality was poor. As digitalization and data optimization increase, AI algorithms are now also able to provide support, thus achieving immense improvements not only in process efficiency, but also in productivity. For example, they can be used to optimize time, production, and process planning. The third aspect is improving product quality through predictive maintenance or the use of AI quality control. The latter can, for example, use computer-aided imaging to identify product defects even on the assembly line, thus improving customer satisfaction in the long term. Although AI methods and applications have now become established, as shown by these three examples which are already being used commercially, broad market scaling has not yet been achieved and AI continues to show immense potential for implementation and growth.

#### **What are the advantages for developers?**

In a globalized world, teamwork and collaboration take on a new meaning. Teams are increasingly made up of people from different cultural and socioeconomic backgrounds. AI solutions can be used to provide support, for example for knowledge management or communication. Does this pose a threat to people's jobs? I don't believe it does. Instead, AI helps to optimize tedious and repetitive activities and enables developers to benefit from a more efficient use of the time they need for working. As a result,

AI can help to balance a developer's activities and let them focus their skills on those tasks that actually require human cognition and are too complex for AI to perform.

**What are the dangers and what measures do developers need take in order to avert them?**

Contrary to what is often implied in science-fiction movies, AI cannot completely replace human thinking. To be more precise, this means that the ability of artificial intelligence to learn must first be provided exclusively by an initial human stimulus in the form of pattern training the corresponding analysis methods. AI is not capable of making decisions itself unless the schema that enables it to make decisions has initially been provided by human interaction. This makes artificial intelligence fundamentally different from human intelligence. Due to the definition of AI, the possibilities for applying AI for universal problem solving, as is often described in future scenarios, are limited, and even technical capabilities will not change the fact that AI cannot exist without initialization by humans. For developers, this means looking forward and viewing AI as another tool that can make their everyday work easier and even more

## “AI solutions can be used to provide support”

exciting, but can also fundamentally change it. As a massive driver of innovation, AI can reduce development time, for example by utilizing efficiency potentials or recognizing patterns. However, if we want to participate in the positive changes brought about by AI, the use of new technology and algorithms is not sufficient. Instead, a fundamental requirement for the everyday use of AI is a rethinking of the competence profiles in the automotive industry. The introduction of AI means that the job profile of a developer or an automotive engineer will have to continue to change. These changes not only affect everyday work, but ideally will already begin during university courses. The topic of AI can no longer be left on the

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“The introduction of AI means that the job profile of a developer or an automotive engineer will have to continue to change,” says Kießling

sidelines if we want to be a leader in automotive development in the digital age. Today, the typical job description of an automotive engineer or a developer has many more interdependencies with other natural sciences and technical areas than it did ten years ago. Both specialists and engineers with more general skills must work more closely together in order to make full use of their competences in an integrated manner. These requirements were also examined very intensively together with my colleague Dr. Thomas Schlick and leading representatives of the automotive industry during the panel discussion at the ATZlive conference in Frankfurt in November 2023, when we considered the question of “whether the engineer of the future will be needed at all”.

**What are the benefits for the user and what are the possible dangers?**

As far as the end users are concerned, AI can offer many advantages, such as new and improved safety concepts, more intensive vehicle experiences, or assistance for mobility, such as autonomous driving, parking space management, or traffic control. AI enables and promotes broad, individually coordinated interconnections between users and automotive

manufacturers through personalized, instantaneous, and digital service management or personalized recommendations, alongside other aspects. At the same time, in the age of the Internet of Things and communicating IT infrastructure, sensors, and vehicle networks, V2V, V2I, and V2N, the dangers for users currently lie within a controllable spectrum and primarily in the area of data security. However, it should be said that regulations, even though they may sometimes seem to be a hindrance for business, nevertheless serve to protect the end user, at least within the European context, and should make users less fearful of AI solutions. Regulations such as the GDPR and other legislation create transparency and offer users the independent choice of how their data is used.

**Carina Kießling, thank you very much for this interesting interview.**

*You can read more of this interview in German language at <https://www.springerprofessional.de/link/26794148>.*

**INTERVIEW:** Frank Jung

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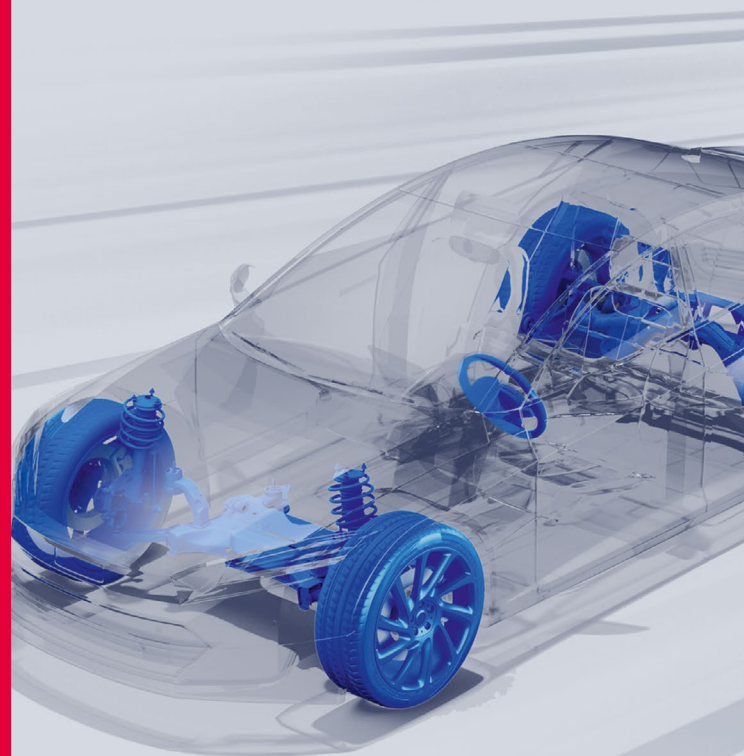
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