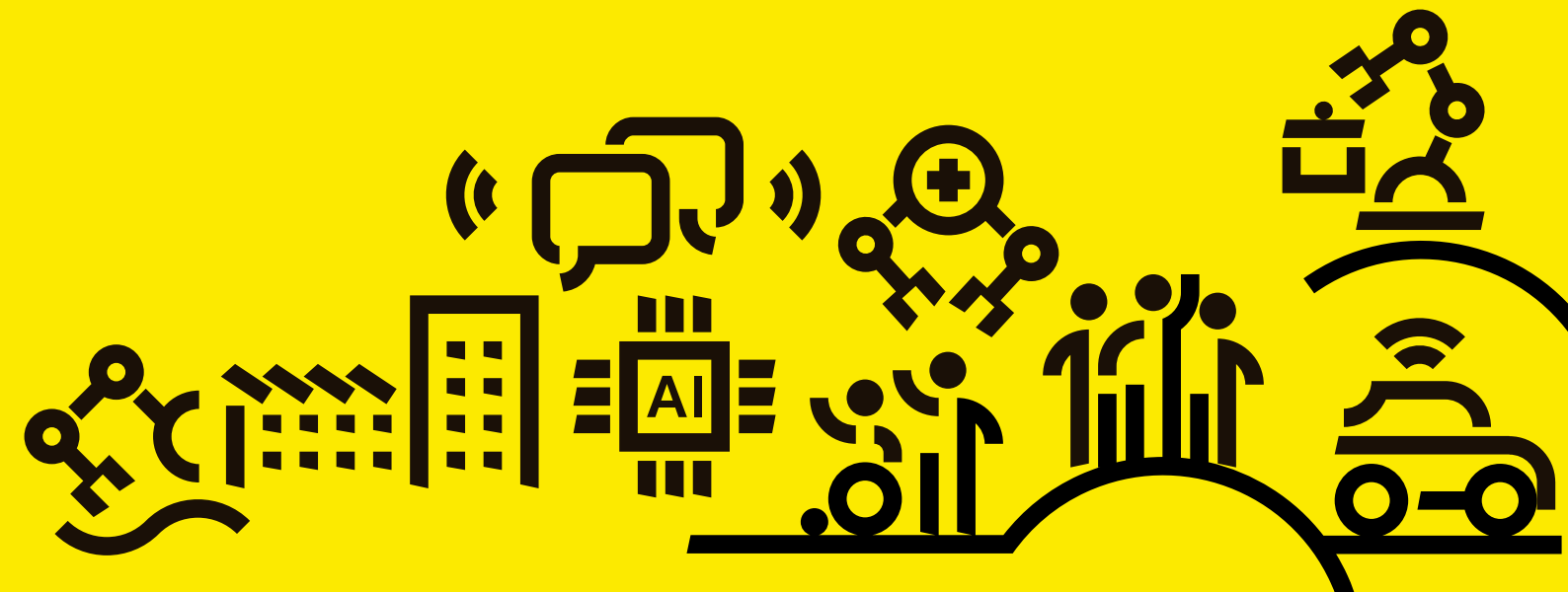
Baden-Württemberg
Ministry of Economic Affairs,
Labour and Tourism

Baden-Württemberg
Ministry of Science,
Research and Arts

Intelligent Robotics for the Future

Position Paper of the Innovation Ecosystem for AI-based robotics in Baden-Württemberg



The status quo and potential of AI-based robotics in Baden-Württemberg

Long-standing robotics expertise meets an innovative AI ecosystem

Baden-Württemberg has a long tradition, ranging from precision mechanics to mechanical and automotive engineering to modern robotics. This has resulted in a diverse robotics landscape with strengths in research, development, and application, along with outstanding domain knowledge. Baden-Württemberg is a leader in robotics in Germany, especially in industrial robotics. The headquarters of about one third (32 percent) of the top 50 robot manufacturers in Germany are located in Baden-Württemberg[1]. With regard to the promising field of service robotics, 18 out of 85 German service robot manufacturers are based in Baden-Württemberg (21 percent)[2].

Market-leading component manufacturers, among others for gripping and safety technology, as well as numerous hidden champions in the field of component suppliers come from the southwest of Germany. In addition, the start-up scene in Baden-Württemberg is broadly based and specializes in promising fields such as cognitive robotics, soft robotics, low-cost robotics, or software solutions for robots. Robotics research from Baden-Württemberg is internationally recognized: from basic research to application-oriented research. In addition to excellent universities and colleges, Baden-Württemberg also has important non-university and business-related research institutions, which are characterized by top-level research in robotics that is visible both nationally and internationally and is application-oriented. They successfully advance the transfer of research to industry.

An important basis for intelligent robotic systems is found in methods of artificial intelligence (AI). With a long-established wealth of top researchers and broad-based excellence, Baden-Württemberg covers a diverse spectrum in the field of AI, from basic research to application-oriented and business-oriented research.

The flagship projects Cyber Valley and the Innovation Park Artificial Intelligence (IPAI), develop and implement AI solutions from basic research to application. The strength of the AI ecosystem is demonstrated, among other things, by the fact that actors from the federal state play a leading role in major European projects such as the TEF AI-Matters. Baden-Württemberg is also driving the development and commercialization of AI innovations. The state of Baden-Württemberg is one of the AI pioneers in Germany, is home to many innovative AI companies and has its particular strength in the application of AI technologies in an industrial context. Together with many other players from outstanding technology regions as well as regionally distributed network and transfer initiatives, a strong AI ecosystem with international appeal has emerged in Baden-Württemberg, whose development and visibility are being decisively effectively promoted.

1 Meyer Industry Research (2025): TOP 50 Robot Manufacturers in Germany.

2 International Federation of Robotics (2024): World Robotics Service Robot 2024 and calculations by Fraunhofer IPA.

Potentials of AI-based robotics for the future

AI-based robotics offers numerous opportunities in the field of industry. Through the use of intelligent and human-centred robotic solutions, production facilities can be used more efficiently and flexibly, while at the same time improving the cooperation between human and machine. This reduces entry barriers and increases the accessibility of automation for users with limited know-how, time or budget. At the same time, flexibility is increased in order to be able to react more quickly to changes. To exploit the full potential of human-robotics interaction in industry, intelligent collaborative robots must be developed. These must meet safety standards that take into account not only the robot itself, but also the objects they grip and grasp. The potentials for intelligent industrial robotics in the future are of particular importance for a region that is strongly influenced by the automotive industry and mechanical engineering. Intelligent industrial robotics offers great opportunities, especially with a view to increasing productivity and strengthening the competitiveness of industry in Baden-Württemberg.

The field of service robotics is also becoming increasingly important and is seen as another important future market. In the future, intelligent robots will be able to take on complex tasks in changing environments and act in close cooperation with humans. This offers great potential, especially for robotics in everyday life, but also in other areas such as transport and logistics, hotel and hospitality as well as medicine. Service robots will also play a crucial role in addressing the challenges of demographic change, including an increasing number of people in need of care. They will also play a role in confronting the shortage of skilled workers. In order to create the necessary trust and reliability of AI-supported robots, there is great potential in human-centred intelligent service robotics and in the areas of safety, security, privacy, and data protection.

The many and varied areas of application for AI-based robotics open up great innovation potential for the Baden-Württemberg players. In many fields of application in the automotive industry, mechanical engineering, logistics and medical technology, Baden-Württemberg is excellently positioned and can secure important competitive advantages through AI-based robotics. Other fields of application such as agriculture and construction or household and care offer great potential for the future.

Vision 2035 of AI-based robotics in Baden-Württemberg

Our Vision:

Baden-Württemberg is the leading innovation region for intelligent human robotic systems

In 2035, Baden-Württemberg is a leader in the field of human-centred, intelligent robot systems. The state charted a decisive course by 2030 and is thus an international pioneer in the development, testing, and implementation of intelligent human robotic systems. Through a clear market orientation, a dynamic and well-connected innovation ecosystem and a special focus on human-centred applications, innovative robotics solutions have emerged in Baden-Württemberg. These have been brought to market and scaled up by start-ups and established companies. The ecosystem covers the entire value chain from research and development to sensors, actuators, hardware, software, AI, data platforms, production, comprehensive system integration, and implementation to necessary services. The basis for the innovative developments are excellent infrastructures. These include physical infrastructures such as innovation and technology centres, research institutions, universities and academia, as well as technical infrastructures (e.g. data centres, quantum computers and platforms), financial infrastructures (e.g. government support programmes), and institutional infrastructures (e.g. innovation-enhancing frameworks and support from clusters and networks).

Baden-Württemberg has established itself as a strong partner in the field of AI-based robotics on the international market in 2035. AI-based robot solutions from Baden-Württemberg stand for a consistent orientation on customer needs and fields of application. A particular core competence is penetrating previously unautomated processes and fields of application outside of standard environments and developing technically mature and economically viable solutions for this purpose. Baden-Württemberg has set itself apart from international competition in the field of high-quality special solutions for complex problems and has established itself as a global solution provider. Innovations from Baden-Württemberg are not only aimed at special solutions, but also at an unrestricted range of applications of robotics, which was achieved by means of functional expansion. Here, a special focus was placed on the field of service robotics for the general public. European regulations such as the AI Act (2024/1689) and the Cyber Resilience Act (2024/2847) were used to the advantage at an early stage to bring particularly robust and safe AI-based robotics to the market.

In this state, numerous test fields and real-world laboratories are already available by 2030. These serve as transfer interfaces from research to application and as a testing space for companies. This can improve the fit of products to market requirements and significantly shorten the time to market. In such closed experimental spaces, the integration of high-risk and novel robotic solutions is also supported in order to promote innovative solutions. To bring new developments to the market, the players from Baden-Württemberg have mobilized not only their own investments but also various sources of financing. In addition to public funding programs, companies are increasingly convincing private venture capitalists with their innovative ideas or entering into cooperations with established companies to advance the scaling of their products. This has enabled economic successes to be achieved, which

in turn have secured the investment of private investors in the long term.

Baden-Württemberg is internationally regarded as an attractive state for the location of robotics companies and has developed into a thriving innovation ecosystem, which has also facilitated the successful recruitment of increasingly international specialists from Baden-Württemberg companies.

Innovative, demand-oriented technology solutions at the highest level

In 2035, Baden-Württemberg with its innovative companies, its excellent research landscape, and strong infrastructures stands for cutting-edge technological developments as well as a fast and market-oriented transfer of intelligent human robotic systems to the international market. In addition, cross-value-added cooperations have been expanded internationally and the players in the innovation ecosystem are central contacts for core components of intelligent human robotic solutions. At the heart of every technological development from Baden-Württemberg is the goal of the concretely implemented application, which contributes to sustainability – economically efficient, socially equitable, ecologically sustainable. AI-based robotics from Baden-Württemberg has become a key technology for many applications worldwide.

The fundamental basis of the intelligent robot systems from Baden-Württemberg is domain knowledge bound in data. This has been successfully translated into data-centric AI models which are trained using intelligent digital twins to establish high-quality robotics solutions in the market. Advanced quantum optimization has greatly improved the precision, flexibility, and performance of AI-driven robotics. The state has placed a technological emphasis on the development and application of soft grippers and robotic hands made of intelligent materials with a sensitivity that reaches and even exceeds the human level in specialized applications. Thus, is a milestone in AI-based robotics. As an industrial state, Baden-Württemberg stands in 2035 as the world's leading shaper for factory automation and for the development of collaborative robotics in industry.

The know-how from the development of industrial solutions in AI-based robotics has been successfully transferred to other applications, in particular service robotics. Baden-Württemberg has thus positioned itself in the field of human-centred intelligent service robotics in pioneering application areas such as healthcare and nursing (e.g. nursing assistants, surgical robots, therapy robots), household robotics, agricultural robotics, or construction robotics. Visionary solutions in the field of cognitive and humanoid robotics have also been successfully launched by players from our state and they have pioneered new fields for modern robotics.

World-renowned cutting-edge research from Baden-Württemberg

Baden-Württemberg has consistently expanded its leading position in European AI and robotics research in 2035. National and international research institutions, such as those working together in the Cyber Valley, are regarded as the

first address worldwide and attract the international research elite. Thanks to a well-founded ethical-philosophical reflection, the resulting AI models – from foundation models to edge AI up to initial approaches to general AI – are resilient, safe, and are applied in a wide variety of scenarios. There is enormous potential for innovation both in the area of robotics foundation models, which work in a similar way to large language models in generative AI (e.g. ChatGPT), and in the area of visual language action models, which enable robots to perform completely new tasks – even in unknown environments – without additional task-specific training. By combining visual perception, speech understanding, and motor action, such generic AI models significantly expand the previous limits of automation and support Baden-Württemberg in further expanding its pioneering role in the field of AI-based robotics.

The excellent research landscape is closely embedded in the regional innovation ecosystem and is one of the global pioneers in technology transfer. Science and industry benefit from the open exchange and diverse cooperations and enable their actors to seamlessly switch between basic and application research.

In particular, effective cooperative structures have been established in topic clusters of robotics and health. The mutual positive influences of these fields ensure the successful transfer of research results into business and application. Real-world laboratories, for example in the areas of autonomous driving, robotic kinematics, service robotics for healthcare, and human-AI interaction, have been able to gain significant new insights in complex projects. Through the excellent scientific research and development of biologically inspired systems, technological hardware developments have been successfully advanced. With the help of robots and AI-supported evaluation, self-driving labs have independently designed new series of experiments and thus iteratively identified new, innovative materials.

Cybersecurity and privacy-by-design are an integral part of Baden-Württemberg's developments, not least due to pioneering research and advanced European legal standards, which the state has championed on the basis of the requirements of the stakeholders of the innovation ecosystem. The connection to high-performance centres in Baden-Württemberg, Germany, and Europe ensures the safe use and further development of AI and robotics technologies – even in sensitive environments such as healthcare.

Dynamic innovation ecosystem through effective transfer

An effective transfer of knowledge from research and development into application and ultimately onto the market is a decisive success factor for Baden-Württemberg as a business location. The basis for this is mutual transparency between science on the one hand and business and society on the other, in order to enable demand-oriented development. By 2035, the transfer has become an integral part of research and development. The actors in the innovation ecosystem see themselves as those who guide this transfer and have further developed innovative approaches and tools to effectively act as a link between business, science, society and politics. An important part of the trans

fer is also the examination of patent rights in order to protect the innovations of our players.

In 2035, it was not only the continued highly successful transfer of knowledge from science to industry that led to marketable robotics solutions. Knowledge transfer between companies, within organisations, and from industry to science or society is also of particular importance for Baden-Württemberg as a business location. Promising start-ups with visionary ideas are of great importance here. Baden-Württemberg's strength in technology transfer in 2035 is reflected in a large number of successful spin-offs that quickly bring their products and services to fruition.

Success through a high acceptance of technology in society

Increasing the acceptance of intelligent robotics solutions in society is essential for their future wide use, especially in the field of service robotics. By 2035, the players in the Baden-Württemberg innovation ecosystem had succeeded in building trust in the technology together with industry, science, politics and society, thereby significantly increasing acceptance.

In particular, the development of human-centred AI robotics solutions is the focus and has led to an active involvement of society through a diverse real-world laboratory landscape and participatory innovation approaches. Thanks to the early involvement of users as well as the consideration of aspects from different disciplines and the orientation towards sustainability goals, the potential benefits of technological development are made directly tangible and society is actively involved. This creates trust and makes everyday life noticeably easier with human-centred intelligent robotics.

Towards a successful innovation ecosystem for AI-based robotics in Baden-Württemberg

Human-centred, intelligent robotics offers great innovation potential for the Baden-Württemberg economy. The starting position in our state is very good and the domestic players already cover essential parts of the value chain in the field of AI-based robotics at a top level.

The innovation ecosystem for AI-based robotics in Baden-Württemberg has defined five fields of action to achieve its vision as a leading innovation region for intelligent human robotic systems and it is a pioneer in the testing and implementation of these solutions.

Field of action 1
Research, development and transfer

- Multilateral partnerships between research and solution providers will be promoted by the innovation ecosystem, which **collaboratively** advances new intelligent human robotic solutions and also the basic technologies required for them (sensors, actuators, information technology).

- Through an open exchange between research and industry, an even stronger **application orientation** in the context of future research work should be considered and thus enable the quick transfer into marketable products.

- In addition, the **transfer of knowledge** within the economy, in particular through highly innovative start-ups, will be further strengthened with the aim of establishing internationally competitive companies from Baden-Württemberg.

- In order to advance AI-based robotics from Baden-Württemberg, the state plans to further support research, development, and transfer of technology with future **funding measures** within the limits of the available budget.

Field of action 2
Scalability and integration capability

- Innovative companies from Baden-Württemberg, especially visionary start-ups, will be increasingly supported in **scaling up** pioneering intelligent robotics solutions.

- In order to validate the scalability of intelligent human robotic solutions in a practical way, improved access to **test fields and regulatory sandboxes** is to be promoted.

- A healthy innovation ecosystem includes **various sources of funding**, including venture capital, business angels, promotional banks or funding, and government grants. These sources help mitigate risks in early stages of innovation.

- A tailor-made **integration capability** of intelligent robot solutions into existing processes and technologies, especially in small and medium-sized enterprises, is of great importance for the medium-sized enterprise centred economy in Baden-Württemberg and is supported accordingly.

Field of action 3
Qualification and skilled workers

- In the future, the field of application for intelligent robots will extend over many areas of life that have so far hardly come into contact with robots, for example in health and nursing care. Early **qualification** of workers and private individuals as users of this technology is therefore of great importance. All stakeholders therefore have an important role to play in the field of vocational education and training.

- In order to successfully meet the shortage of skilled workers, it is important both **that domestic experts** be kept in the state and **national and international specialists** be recruited. Through a lively welcoming culture, the innovation ecosystem contributes to the recruitment of both domestic and national and international specialists.

- Baden-Württemberg supports the actors in the state with industry-open **measures and structures**, which address both the topic of qualification in education and training, as well as the problem of securing skilled workers. This supports the domestic economy in the best possible way in the recruitment of skilled workers.

Field of action 4
Cooperation, visibility and acceptance

- Through a **targeted networking** of the existing actors in the state, trustful cooperation is to be strengthened, and an open cooperation culture is to be promoted. To this end, existing networks, transfer organization units, and interest groups must exchange information more intensively and consistently bundle their competences and offers among themselves as well as with companies and scientific organizations.

- A fruitful and close **cooperation** between the actors of the innovation ecosystem can be promoted through intensive exchange and joint workspaces.

- In order to strengthen Baden-Württemberg's **visibility** as a solution provider, the competencies and fields of application available in the state should be clearly presented and openly accessible to all interested parties.

- Regular, thematically focused **events**, organised by the participants of the innovation ecosystem, promote open dialogue and create synergies within the innovation ecosystem, while promoting visibility to the outside world.

- The **acceptance** of intelligent robotics within society will be strengthened by the diverse experience and testing of innovative practical robotics applications that put people at the centre.

Field of action 5
Regulatory framework

- An **innovation-friendly design** of the given framework conditions is of great importance for Baden-Württemberg as a business location in order to remain competitive in the long term. The state's government will continue to work for this purpose with the relevant bodies in the federal government or the EU in the future.

- Regulatory sandboxes enable **regulatory learning** so that the findings can be used to further develop the legal framework. In order to increase the willingness to take risks and thus the willingness to innovate, a positive culture of error should be lived here.

- In addition, the **removal of bureaucratic hurdles** is a vitally important driver of innovation and helps us enter into cooperation. The state of Baden-Württemberg is already pursuing the issue of reducing bureaucracy intensively and is also advancing it further in cooperation with the federal government.

The fields of action presented are to be further advanced in the short to medium term through a jointly coordinated approach by the actors of the innovation ecosystem AI-based robotics in Baden-Württemberg. This is particularly important in the dynamic field of intelligent robotics and in view of the international competitive pressure. Based on the defined fields of action, the goal is to derive a joint roadmap with concrete activities, which is not only quickly implemented but also includes the achievement of essential goals until 2030. At the same time, it includes the interests of the medium-sized economy from the outset. After all, it is only with a successful transfer and economically viable implementation that ideas and developments become real innovations that significantly contribute to maintaining the competitiveness of Baden-Württemberg's economy.

Supporting organisations of the position paper

The position paper “Intelligent Robotics of the Future” in the innovation ecosystem for AI-based robotics in Baden-Württemberg is the product of an intensive discourse between the Ministry of Economic Affairs, Labour and Tourism and the Ministry of Science, Research and Arts with the diverse actor landscape of AI-based robotics in Baden-Württemberg. Together, we have developed a vision for the future in 2035, which is to be achieved through the joint efforts of all stakeholders in the innovation ecosystem.

Through the innovation ecosystem, the various stakeholders from the fields of business, science, politics, and society as well as intermediaries are to be more closely interlinked. This position paper was prepared together with stakeholders from the innovation ecosystem AI-based robotics in Baden-Württemberg. A list of the supporting organisations of the position paper is presented below.

Allianz Industrie 4.0 Baden-Württemberg beim VDMA e. V. Baden-Württemberg

ARENA2036 e.V.

autonox Robotics GmbH

BadenCampus GmbH & Co. KG

Bosch Rexroth AG / Robert Bosch GmbH

Cyber Valley GmbH

Deutsche Institute für Textil- und Faserforschung Denkendorf (DITF)

fem Forschungsinstitut

Festo SE & Co. KG

Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO

Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung IOSB

Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA

fruitcore robotics GmbH

FZI Forschungszentrum Informatik

Hahn-Schickard-Gesellschaft für angewandte Forschung e.V.

Institut für Anthropomatik und Robotik am Karlsruher Institute für Technologie (KIT)

Institut für Arbeitswissenschaft und Technologie-management (IAT) an der Universität Stuttgart

Institut für KI-Sicherheit am Deutschen Zentrum für Luft- und Raumfahrt e.V. (DLR)

Institut für Künstliche Intelligenz an der Universität Stuttgart

IPAI Management GmbH

Neura Robotics GmbH

Premium Robotics GmbH

pssbl. Robotics GmbH

RKW Baden-Württemberg GmbH

SCHUNK SE & Co. KG

SOTEC GmbH & Co KG

Trumpf GmbH & Co. KG

WEISS GmbH

Weiss Robotics GmbH & Co. KG

Appendix

The state's current funding measures for AI-based robotics

As a state, we recognized the potential of AI-based robotics for Baden-Württemberg as an industrial location at an early stage and have supported it to date with more than 500 million euros. This includes the funding of pioneering AI projects such as Cyber Valley and IPAI, which are fundamental to AI-based robotics in Baden-Württemberg.

The state's activities in the field of AI-based robotics contribute to the existing state strategies in the areas of innovation and digitization. With its innovation strategy, Baden-Württemberg wants to contribute to securing Germany's outstanding position as a business and innovation location in the long term. As part of the state's innovation strategy, the fields of robotics and AI have been identified as important future fields that are to be specifically funded.

The digitalization strategy digital.LÄND focuses on concrete added value for the people in the state. The projects and initiatives are intended to secure prosperity, sustainability, social cohesion, and digital sovereignty in Baden-Württemberg. The high importance of the key technology AI is highlighted in the context of the digitization strategy. With a variety of measures, such as the Innovation Campus Cyber Valley, the IPAI, the AI Innovation Centre, and the AI Centres of Excellence, the state has purposefully promoted the emergence of a strong and unique ecosystem for AI and is resolutely advancing its further development and international visibility. At the same time, this has created excellent foundations for AI-based robotics in Baden-Württemberg.

In the following, support measures of the state are presented, which contribute to the outlined vision of the future in 2035. In addition to targeted funding measures for the areas of robotics and AI, there are also technology-open funding programmes such as Invest BW available for the actors in the state. The following list is an excerpt of the current funding that contributes to AI-based robotics.

Excerpt of the current support measures of the state:

Innovation Campus Cyber Valley

Cyber Valley is Europe's largest and leading centre for excellence in artificial intelligence (AI) and modern robotics. Leading researchers in the Stuttgart, Tübingen, and Karlsruhe regions are working on basic research and transfer projects. The central scientific actors of the Innovation Campus are the Max Planck Society, the Universities of Tübingen and Stuttgart, the Karlsruhe Institute of Technology (KIT), the Fraunhofer-Gesellschaft, and the first ELLIS Institute in Europe. With the Tübingen AI Center, Cyber Valley is one of the national AI competence centres and thus another important flagship project. In addition, the Universities of Stuttgart and Tübingen are involved in the Excellence Strategy of the Federal Government and the states with several Clusters of Excellence. Among other things, the University of Tübingen is contributing the Cluster of Excellence Machine Learning, while the University of Stuttgart is contributing the Cluster Data-Integrated Simulation Science (SimTech). Together with two Max Planck Institutes, they are also collaborating at the Center for Bionic Intelligence Tübingen Stuttgart (BITS)

and are planning the Cluster of Excellence Bionic Intelligence for Health. The aim of Cyber Valley is to create a dynamic ecosystem that fosters innovation and strengthens the region's international competitiveness in the field of AI by closely linking basic research and industrial application. In addition to research, the campus attaches great importance to the transfer of knowledge and technology, as well as the support of start-ups in order to increase economic value creation in the region. In addition to the basic funding of the participating institutes, universities and KIT, the Ministry of Science, Research and Arts has so far provided Cyber Valley with 426 million euros in funding for projects and additional research buildings. The Innovation Campus is funded annually with approximately 22 million euros in addition to its basic funding.

Innovation Park Artificial Intelligence (IPAI)

With the IPAI, a value-added centre for AI with international appeal will be built on a 23-hectare campus in Heilbronn, in which the entire value chain in terms of AI will be mapped from research and qualification, to development, to commercialization. This is where companies, start-ups, applied research and science, current and future talent, investors and public sector actors come together to work synergistically on AI-based software products and solutions and thus increase value creation in the field of AI. The IPAI ecosystem offers the opportunity to network, educate, and inform as well as to use state-of-the-art infrastructure as a basis for innovation.

The Ministry of Economic Affairs, Labour and Tourism is funding the project with up to 50 million euros. The competition entry of the City of Heilbronn, the Stadtsiedlung Heilbronn GmbH, and the Dieter Schwarz Foundation prevailed in the site selection process. According to the expectations of the state government, the IPAI will trigger private and public AI investments in the billions.

Part of the IPAI is the IPAI Lab, a regulatory sandbox for AI with a state-of-the-art and powerful IT infrastructure. Companies can test their AI solutions under real conditions here. The focus of the regulatory sandbox is on the interaction of robotics, intralogistics, and data centre interaction.

AI Innovation Center Learning Systems and Cognitive Robotics (KIFZ)

The AI Innovation Center was founded in October 2019 by the Fraunhofer Institutes IAO and IPA and acts as a central point of contact for SMEs in Cyber Valley. Since 2021, the area of cognitive robotics, i.e. technologies at the interface of AI and robotics, has also been established and expanded at Fraunhofer IPA under the umbrella of the AI Innovation Center. The aim of the AI Innovation Center is to provide companies, and in particular SMEs, with access to the latest AI research results and to support them in developing technologically ambitious AI innovations. For this purpose, a multi-stage technology transfer concept was developed.

The total budget of the AI Innovation Center for the period 2019 to 2025 amounts to a total of around 33 million euros. The Ministry of Economic Affairs, Labour and Tourism is funding the project with 19

million euros, while the Fraunhofer-Gesellschaft is contributing 14 million euros.

Testing and Experimentation Facilities Manufacturing (TEF AI-Matters)

The European Union has launched the AI-MATTERS network, consisting of 25 facilities from eight EU countries, to promote testing and experimentation facilities (TEFs) for AI in production. AI-MATTERS is one of four networks which address the four sectors of production, health, agriculture/nutrition, and smart cities. The German branch of AI-MATTERS is being developed at the Stuttgart site in cooperation with the University of Stuttgart and the ARENA2036 research campus as well as the Physikalisch-Technische Bundesanstalt Braunschweig under the direction of Fraunhofer IPA.

Since 2024, the aforementioned testing and experimentation Facilities have been set up at eight European locations, where companies can test and certify AI-based components. The funding period lasts until the end of 2027. AI-MATTERS receives 3.95 million euros from the Ministry of Economic Affairs, Labour and Tourism with the aim of raising the potential of AI in the manufacturing industry, strengthening the competitiveness of Baden-Württemberg as a production location and encouraging digital sovereignty in Europe.

Relevant projects of the Invest BW innovation support programme

Invest BW is the central innovation support programme of the state of Baden-Württemberg. Since the first iteration of the programme in January 2021, more than 300 million euros of state funds have been made available so far. Invest BW is thus the largest single-company support programme open to the industry in the history of Baden-Württemberg. In the previous calls for funding, approximately 680 projects have been funded and investment and innovation projects worth more than 750 million euros have been initiated. This benefited in particular start-ups and small and medium-sized enterprises, which received more than half of the funding.

As part of the Invest BW innovation funding programme, which is open to technology, numerous projects that contribute to AI-based robotics have already been funded by the Ministry of Economic Affairs, Labour and Tourism. Projects directly related to intelligent robotics received a total of approximately 7.1 million euros in funding. In addition, however, many other Invest BW projects contribute indirectly to AI-based robotics.

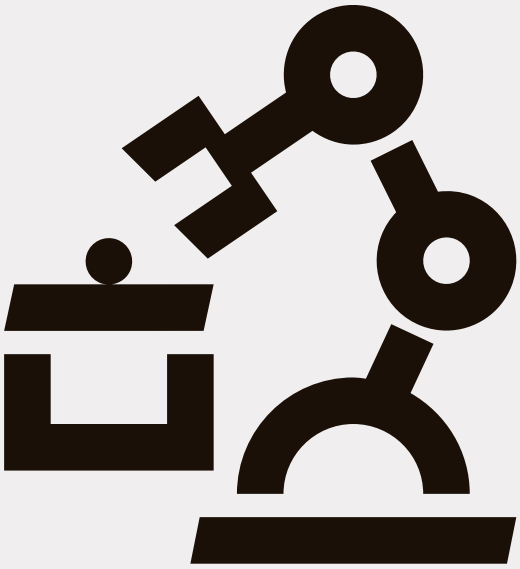
Regulatory sandboxes for legally-compliant AI and robotics (KIRR REAL)

The regulatory sandbox for legally-compliant AI and robotics is intended to support companies in Baden-Württemberg in implementing the EU AI Act and the EU Machinery Regulation and to provide impulses for practical implementation

and further development of AI regulation. For this purpose, so-called ‘legal quick checks’ are carried out. These are analyses of the legal conformity of AI applications with regard to the AI Regulation of the European Union (AI Act) and the Machinery Regulation applicable from 2027. The combination of research proximity and legal expertise should lead to new findings regarding the legally-compliant use of such systems and should significantly support companies in the market introduction of new technologies.

The regulatory sandbox is operated jointly by the Fraunhofer Institute IPA and the research campus ARENA2036 in Stuttgart. Both project partners are also significantly involved in the EU flagship project ‘AI-Matters’, a transnational network of testing and experimentation centres for AI and robotics in production environments (see above). With the combination of an AI regulatory sandbox and a test and trial centre at the Stuttgart site, Baden-Württemberg is playing a pioneering role in the European network.

The regulatory sandbox for legally compliant artificial intelligence and robotics is funded by the Ministry of Economic Affairs, Labour and Tourism with 495,000 euros until December 2025.



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