

Advancing AI-based Robotics through Autonomics

About me (Prof. Dr.-Ing. Patrick Wolf)

I am a junior professor of Computer Science at RPTU University Kaiserslautern-Landau and lead the Adaptive Autonomy & Off-Road Robotics Lab, focusing on dependable autonomous robotic systems, adaptive autonomy, and AI-based robotics. At Fraunhofer IESE and RPTU, I work at the intersection of AI-based robotics, industry, and society, connecting fundamental research with real-world industrial applications.

My Scientific and Industrial Vision for the Future of German Robotics

Robotics is undergoing a fundamental transformation through AI. Increasingly capable robots are moving from structured industrial environments into open, dynamic, and human-centered settings. This creates new scientific and engineering challenges. So far, Germany has an excellent robotics research ecosystem. Yet translating this research into widely deployable, affordable, safe, secure, and commonly accepted products and services remains a key challenge. The next generation of robotics will make this challenge even more complex. Real-world adoption is not determined by technical performance alone. Questions such as "How safe is safe enough?", "What level of autonomy is economically viable?", or "How should robots be designed to be commonly accepted?" cannot be answered from a technological perspective alone, and consequently, the future of robotics cannot be decided in laboratories alone.

I see Autonomics as the perspective that connects autonomous systems with their technical, industrial, societal, legal, and economic context. It helps fill blind spots in a technology-focused perspective that are slowing advancements in German robotics. Therefore, with an interdisciplinary vision, autonomics allows the robotics community to ask the most relevant questions for future research. In Kaiserslautern, I am already developing this vision together with personalities such as Prof. Liggesmeyer, Prof. Wahlster, and Prof. Kagermann. Consequently, I want to bring this vision to the DGR community as well.

My vision for the DGR Community

The DGR should be the central platform where German robotics meet. Therefore, I want to bring together the diverse communities within robotics and strengthen connections across their research, expertise, and application domains. Further, the DGR should invite neighboring disciplines such as social sciences, economics, or jurisprudence to contribute to German robotics. At the same time, the DGR should connect research institutes with startups, SMEs, and established industry. The objective is to give the DGR the capacity to identify important challenges for robotics and bring the right people together to address them. While RIG and its member institutions provide the scientific and technological foundation of German robotics, my understanding of DGR's role is to strengthen the community around this foundation. It should represent their interests and shape the conditions in which robotics research and innovation can thrive.

My ideas for the future national and international representation of the DGR

The DGR should be a strong and credible voice for robotics in Germany. Thus, I want to strengthen its interaction with politics, funding organizations, industry, and the public. DGR should contribute to discussions on AI, robotics regulation, safety, standards, education, and industrial policy. DGR should also seek cooperation with neighboring scientific and professional societies, such as the Gesellschaft für Informatik. Our goal should be to actively shape national and international discussions about the future of autonomous robots. Moreover, the DGR should actively shape the framework conditions for robotics research and innovation in Germany. I want to ensure that emerging areas of robotics are appropriately represented in future research and funding structures. A strong example is the DGR's engagement with the DFG, which has contributed to a stronger and more appropriate representation within the DFG's funding structure. Autonomics can provide a valuable perspective here and will be a promising future direction for such advancements.

Creating New Resources for the Community

A strong DGR needs the capacity to initiate activities that membership fees alone cannot finance. I would therefore work to develop additional funding sources through industry partnerships, sponsorships, and joint initiatives with other organizations. Additional funding should enable the DGR to act proactively.