

# ROBOTEC.AI POWERS OPEN-SOURCE DIGITAL TWIN PLATFORM WITH AMD KRIA™ SOM

## CUSTOMER / PARTNER



## INDUSTRY

Robotics

## CHALLENGES

Robotec.ai is on a mission to help the world build safe, human-friendly robotics using its open-source, AI-based digital twin simulation tools.

## SOLUTION

The Robotics Operating System (ROS)-compatible Kria™ SOM from AMD allows Robotec.ai customers the flexibility to build, test, and validate their designs and operations using digital twin simulators that are open-source.

## RESULTS

The AMD Kria SOM helps Robotec.ai customers target the right engine to the right task and helps ease customer transitions from simulated to real-world environments.

## AMD TECHNOLOGY AT A GLANCE

AMD Kria™ SOM; Vitis™ Accelerated Libraries

Robotec.ai builds digital twin and simulation platforms for manufacturing, logistics, warehousing, and industrial markets. It also has customers in automotive, agriculture and mining. Its primary focus is on autonomous mobile robots (AMRs), robot arms, and legged robots.

## CHALLENGE

The company is on a mission to help the world build safe, "human-friendly" robots using its AI-based digital twin simulation tools. A digital twin is a virtual copy of a real system that you can update or interact with. Just being able to deploy sensors in a site, you can observe the operation and get analytics and operational data. You can create synthetic data from these simulations to develop and train AI models. Moreover, you can test if your technology is safe and improves productivity.

"We're helping to reduce time to develop robotic systems," said Adam Dabrowski, chief technology officer at Robotec.ai. "We're reducing the cost of development with simulation, and making sure customers can scale up their robotic systems very fast."

## SOLUTION

Robotec.ai's flagship platform is called RoSi. It's an end-to-end digital twin simulation tool that accelerates the development, training, and testing of robotics and automation systems. This highly modular, open-core product can be adapted and scaled to customer needs. Of the modules, there are several for scaling and sensor simulation, and several that are domain specific.

"RoSi's simulation capabilities are so diverse," Dabrowski said. "It lets you validate robots with both software-in-the-loop and hardware-in-the-loop, and simulate an entire operational site, such as a mine or a warehouse. Our platform is used to validate all kinds of robot software that people are developing before deployment, but even after automation has matured, the tool is useful for optimizing the operation and simulating production."

"Digital twins let you view and manage site operations. If you have a digital copy of a site but you want to add a behavior and see what the impact would be, a digital twin is the way to go," Dabrowski said. In factories, digital twins can help manufacturers understand how automation might impact areas where humans are working and help make systems safer and more productive. In mining, digital twins of entire operations can help identify potential danger spots before they become a problem.

"It's safer than testing in a real-world environment, and can also dramatically reduce costs and time-to-market," he added.

Robotec.ai's digital twin solutions are being used by major players in industrial manufacturing, agriculture, and mining industries. "The technology is widely used, but not quite universal, yet," said Michał Niezgoda, CEO of Robotec.ai. He added



that the market is valued at around \$20 billion today, but estimated to reach \$120 billion by 2031.

### CONNECTING WITH AMD

Niezgoda said the company connected with AMD through GitHub and OpenSource World. “Fifty percent of robots use ROS (Robotics Operating System) packages, so the fact that AMD is involved in the ROS community was a huge plus for us,” Niezgoda said. “We contacted the AMD embedded team and began working on hardware-on-the-loop simulations, and ultimately built a demo using the AMD Kria™ SOM that has attracted a lot of attention and positive feedback from customers.”

Niezgoda said the AMD open-source approach is very important to Robotec.ai. “With open source, customers can check the technology on their own, inspect the code for potential cybersecurity issues, and have a community behind them that validates their approach. With proprietary solutions, you’re reliant on a single vendor, and their schedule, to meet your needs.”

The AMD Kria SOM is particularly valuable for digital twins because it can collect and analyze vast amounts of sensor data at the edge in real-time, helping client systems quickly make informed decisions and optimize processes. The Kria SOM accelerates the whole application, from AI to control, delivering AI with exceptionally low power and low latency. Additionally, its FPGA fabric makes it adaptable to rapidly changing software and hardware requirements.

The AMD Vitis™ Accelerated Libraries, used with the Kria SOM, include an extensive set of open-source, performance-optimized tools that offer out-of-the-box acceleration with minimal to zero code changes to existing applications. These tools helped Robotec.ai quickly prototype the accelerated perception algorithm on the FPGA with the desired performance, and they were also used for hardware-in-loop simulations.

“Kria is a good computing platform for robotics,” Niezgoda said. “There is ROS alignment between the Robotec.ai platform and AMD Kria SOM that can ease the transition from simulation to the real world and make integration cheaper,” he said.

### RESULT

“Customers value FPGA-based technology that provides determinism and all the certification that AMD provides,” Niezgoda said. “They can test software and their embedded platform in ways that are different than in the cloud. What makes the Kria SOM so ideal for robotics is that you can target the right engine to the right task. And the Vitis Libraries that come with it let you quickly prototype your solution.”

He added that Robotec.ai’s open-source approach allows the company to support a wide array of digital twin solutions. “With AMD, we can deliver more flexible options and build a counterbalance to what the competition is offering. We believe this partnership has allowed us to forge one of the best-performing simulation solutions in the market.”

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#### ABOUT ROBOTEC.AI

Robotec.ai is a software company that empowers the development of simulation platforms for robotics applications. The company’s Simulation and Robotics teams deliver ROS2-enabled, scalable simulation solutions for automotive, agriculture, manufacturing, logistics, mining, and construction industries. Its AI team develops Agentic AI framework RAI for robotics to bring Gen AI capabilities to robots. AI-powered robots can be tested in the simulation provided by Robotec (<https://www.robotec.ai>).

#### ABOUT AMD KRIA SOM ADAPTIVE SoC

Kria SOMs were designed with SW engineers in mind, providing familiar design environments without requiring FPGA programming experience, and enabled by the Kria Starter Kits that are low-cost out-of-the-box ready development platforms. For more information, please visit [www.amd.com/kria](http://www.amd.com/kria).

#### ABOUT AMD

For more than 50 years, AMD has driven innovation in high-performance computing, graphics, and visualization technologies. Billions of people, leading Fortune 500 businesses, and cutting-edge scientific research institutions around the world rely on AMD technology daily to improve how they live, work, and play. AMD employees are focused on building leadership, high-performance, and adaptive products that push the boundaries of what is possible. For more information about how AMD is **enabling today and inspiring tomorrow**, visit the [AMD \(NASDAQ: AMD\) website](http://AMD (NASDAQ: AMD) website), [blog](#), [LinkedIn](#), and [Twitter](#) pages

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