Protecting and managing forests with AI

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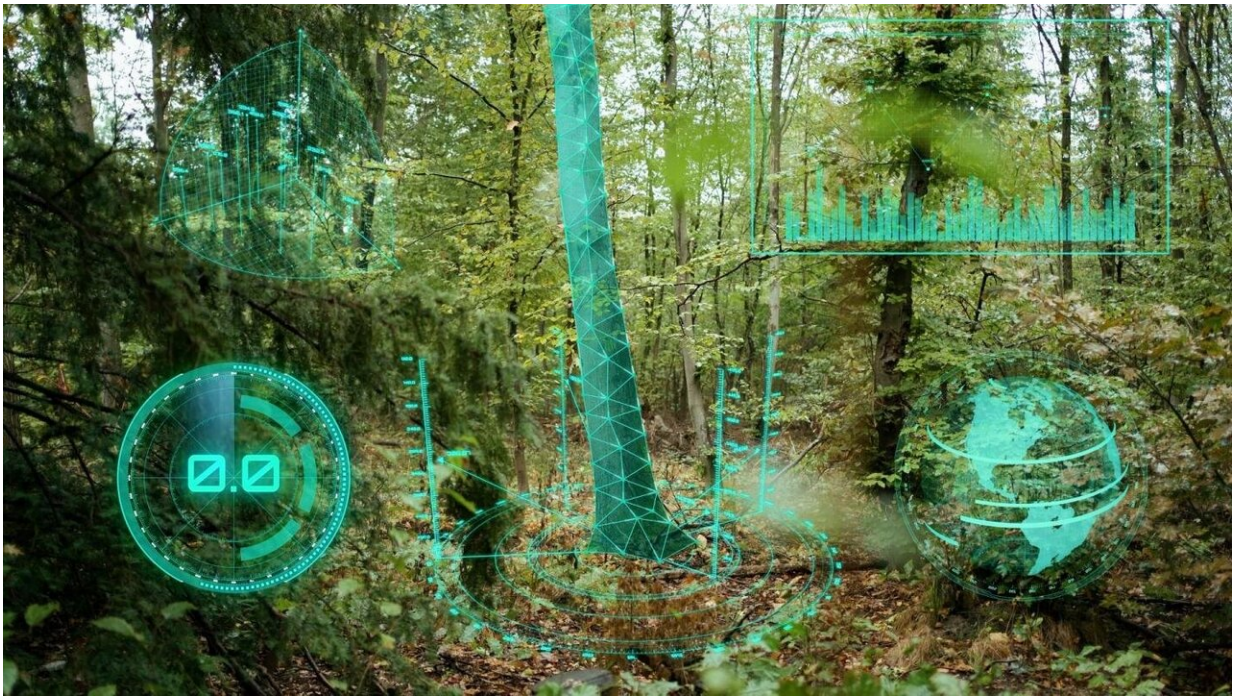

Support of local foresters: KIT and EDI GmbH develop an AI-based assistance system for forest management. Credit: Dominic Hohlbaum/Triebfeder

Drought, heat, and pest infestation: Climate change is threatening forests in Germany and represents a big challenge in forest management. A joint project of Karlsruhe Institute of Technology (KIT) and EDI GmbH, a spinoff of KIT, now provides support. Together with partners in the forestry sector, they are developing the EDE 4.0 assistance system. Based on artificial intelligence (AI), it helps foresters preserve and

sustainably manage forests.

Climate change also affects forests in Germany. Currently, the biggest forest dieback since the 1980s is taking place. In Baden-Württemberg, 43 percent of all forest areas are damaged. Science will now help take countermeasures and make forest ecosystems more resistant: "Mixed forests with hornbeam, maple, or wild cherry cope with the new conditions much better than spruce forests, but are less profitable. When planting trees, soil properties play an important role," says climate researcher Dr. Joachim Fallmann from the South German Climate Office of KIT. "Forest management has to respond and to carefully balance various aspects." To help foresters make optimal data-based decisions, EDI GmbH, a spinoff of KIT specialized in intelligent industry software, the South German Climate Office, and KIT's Institute of Geography and Geoecology develop a cloud-based decision support system based on artificial intelligence (AI) methods. The interdisciplinary project EDE 4.0 (German acronym of Extended Dynamic Planning of Logging) is carried out in close cooperation with partners in the forest management sector and is aimed at supporting sustainable forestry.

Intelligent Assistance System for Forest Management

The assistance system is based on a software solution made by EDI GmbH. The EDI hive IoT framework was originally designed for machine learning in the aerospace and mechanical engineering sectors. "Our development work will result in a mobile app that can be operated intuitively and uses AI to support local foresters when deciding where to log or when to plant new trees. Moreover, the system will output success perspectives when planting a tree at a specific location," says Dr. Thomas Freudenmann, one of the founders of EDI GmbH.

For the system to supply relevant results, it first has to recognize

relationships and patterns. For this purpose, many data from various areas are merged. These are data on medium-term climate development provided by the German Weather Service and KIT's Institute of Meteorology and Climate Research. The Institute of Geography and Geoecology of KIT supplies specific forestry-related data. The forestry sector contributes information on the market environment. In addition, the assistance system will consider the local knowledge and expertise of foresters. (mhe)

Provided by Karlsruhe Institute of Technology

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