A Breakthrough in AI Identification of Planktonic Algae at the South-to-North Water Diversion Project (Middle Route)

Xinhua News Agency, Wuhan, January 30 (Reporter Li Siyuan). According to a report by the Yangtze River Eco-Environmental Supervision Administration and Scientific Research Centre, of the Ministry of Ecology and Environment of the People's Republic of China, a breakthrough has been made in the AI identification of planktonic algae in the South-to-North Water Diversion Project (Middle Route) after three years of research. The intelligent equipment developed has achieved a breakthrough automation in the aspects of multi-channel algae sample loading, focusing, imaging, identification and counting. Under unattended conditions, automatic analysis and output of multiple indicators such as algae species, proportions, and algae density can be achieved.

Currently, the dominant monitoring method of planktonic algae domestically and overseas is still manual microscopy, and existing monitoring equipment is mostly based on spectroscopy or traditional image recognition algorithms, which has large detection errors. In order to break through the bottleneck of algae identification accuracy and focus on the actual demand for automatic online monitoring of planktonic algae in the South-to-North Water Diversion Project (Middle Route), the Yangtze River Monitoring and Scientific Research Centre, supported by the National Water Special "13th Five-Year Plan" project "Construction of water quality early warning and operational management platform for the South-to-North Water Diversion Project (Middle Route) ", the Construction Administration for the South-to-North Water Diversion Middle Route Project and other units to carry out planktonic algae AI identification research on algae automatic sampling technology, multi-channel microscopy and image processing technology, and the development of planktonic algae AI identification models.

The planktonic algae AI identification equipment integrates auto-sample loading device, digital microscopic image auto-scanning system, and intelligent algae identification software, which can automatically switch, pick, and identify up to 15 samples at one time. Meanwhile, a standardized planktonic algae marker library was specially constructed, and deep learning training and optimization were carried out in accordance with the difficulties of planktonic algae, such as: diverse species, various distribution, and complex classification basis.

In the future, planktonic algae AI identification equipment can be widely used in the field of ecological and environmental protection. It provides a strong support for lake and reservoir eutrophication monitoring, as well as algae bloom monitoring, early

warning, prevention and control. Furthermore, it can be extended to zooplankton, fish, and automatic monitoring of other aquatic organisms.

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References
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The original report can be found at the following hyperlink:
http://www.xinhuanet.com/2021-01/30/c_1127045336.htm
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