



Electric eel

ROBOTIC EEL CAN FIND WATER POLLUTION SOURCE

 NONPROFIT & SOCIAL CAUSE

The 'Envirobot' robo-eel can move around in open water and take pollution measurements without disturbing the habitat.

Researchers from the [EPFL](#) research institution in Switzerland have created a robotic eel that can measure water pollutant levels. The sensor-equipped eel can swim through contaminated water to find the source of pollution, moving on its own accord by being controlled remotely. When tested in Lake Geneva, it was found that the robot could also generate maps of water conductivity and temperature.

The project is funded by the Swiss NanoTera Program to help build a robot that can detect water pollutants. The eel robot, coined 'Envirobot', has chemical, physical and biological sensors embedded within its almost 1.5 meter long construction. The sensors take measurements at different locations in the water as it 'swims' and transfers the data back to a linked computer in real-time. The robot is made up of numerous modules that each contain a small electric motor for changing curvature, enabling it to move smoothly through the water just like an eel. The modular design also allows engineers to change its composition and vary its length as needed.

Some of the modules contain conductivity and temperature sensors, while others have tiny chambers that fill up with water as the robot swims. These chambers contain miniaturized biological sensors that house bacteria, small crustaceans or fish cells. The sensors work by observing how these organisms react when put into contact with the water, giving an indication of whether certain key pollutants are present and the level of the water's toxicity. A recent test involved simulating water pollution by diffusing salt into a small area of a lake just off the shore, thus changing the water's conductivity. The researchers then let the robot swim in the contaminated area, and it

successfully mapped the variations in conductivity and generated a temperature map. The ultimate goal is for the robot to be able to detect heavy metals, such as mercury.

Robots are being entrusted to fulfil more and more tasks in the real world, with a solar-powered device that **autonomously weeds the garden** and another that **inspects bridge faults**, being just two examples on either end of the scale of possibility. How would you utilise a robot to assist with your everyday life?

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