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Wetlands monitoring with innovative autonomous vehicles

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Wetlands are geographic areas where water meets the earth. They cover between 5 and 8% of the Earth's surface. These include mangroves, bogs and marshes, rivers and lakes, alluvial plains and flooded forests, shallow coasts and coral reefs. They are essential ecosystems for human life. In fact, rich of life, these zones are very important sources of freshwater, but also natural purification systems and carbon resources for fauna but also commercially for fishing. Various international conventions, directives and projects work on their protection that can help fighting the disasters resulting from climate change. However, the acquisition and monitoring of environmental parameters in these areas is difficult and ineffective. Classical vehicles (boats or wheel vehicles) are not effective and sometimes these areas are inaccessible or dangerous to human beings (critical or extreme environments). The development of innovative unmanned technologies can make surveys faster, efficient, less costly, and more precise. Robots work over extended periods of time and less staffing is required due to the high level of robot autonomy. In this study, several technological solutions are explored and an unmanned modular and portable vehicle with an innovative propulsion system suitable for working in shallow water is described.

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