National Park Environment Management

AI/IoT-powered Dashboard for Environmental Management at Tram Chim National Park
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Context

Tram Chim National Park (a Ramsar site), located in Dong Thap province (Vietnam), is one of the last remnants of the threatened Plain of Reeds wetland ecosystem. Tram Chim has significant biodiversity and tourism value, providing habitat for over 230 bird species and 130 fish species, including the iconic Sarus Crane listed as endangered on the International Union for Conservation of Nature Red List.

Current environmental management and research at Tram Chim are hampered by insufficient and irregular survey data, due to a lack of digital resources, extreme weather conditions and complex, large environment covered by the park. These present serious challenges for making informed decisions and deploying management strategies for the Park's ecosystem on a daily basis. It is also highly difficult to demonstrate, evaluate and track the impact of certain management interventions on the Park's ecosystem health.

Solution

This project brings together leading experts in Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), Environmental Engineering and Conservation Biology from the University of Wollongong in Australia and Ho Chi Minh City University of Technology in Vietnam to transform the environmental management of Tram Chim National Park. Other project partners include technology giant Microsoft, Tram Chim National Park and Dong Thap province. The solution will utilise a diverse range of IoT devices to allow regular surveys of large areas in Tram Chim. AI/ML technologies will be leveraged to process, analyse and classify large volumes of data into metrics that give real-time insights into the Park's ecosystem health.

Key activities

1. Design and deploy a hub of IoT devices that will collect data (e.g. images of animals, plants and water levels, water turbidity, temperature, CO_2 and other parameters) in various areas of the Tram Chim National Park ecosystem.

2. Develop and utilise AI/machine learning and image processing algorithms and models to automatically process and analyse the collected data to generate various insights, e.g. identifying and counting animals, recognising plants and their conditions, and identifying water levels and quality in different parts of the Park.

3. Develop a digital AI-powered dashboard that is readily accessible to different stakeholders of the Park (e.g. rangers, governance officers and researchers) through various computing devices (e.g. PCs, mobile phones or tablets) to support the decision making and adaptive management at Tram Chim National Park. The digital dashboard will also offer a clear demonstration of how management interventions impact important metrics of the Park's ecosystem health.

For further information

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