Group: Open Group

Sub-theme: I&T for Nature (Yama)

Project Code: O-001429

JAPJAP Food Waste Self-Service Recycling Station

(内容只提供英文版)

User Pain Points

Over 3,000 tons of litter are collected annually in Hong Kong's country parks, with 2.5 tons food waste from campsites per day. These leftovers not only contribute to the city's waste management burden, but also attract nearby wildlife and pests. Consequently disrupting the natural ecosystem and spreading infectious diseases. The onsite Iot-empowered bio-recycling system, JAPJAP, utilises black soldier flies (BSF) to effectively break down one ton of organic matter per month, producing valuable by-products that can be reintroduced into nature. Meanwhile, the solution is combined with a sustainable educational purpose, promoting food waste management in the natural context.

Solution Benefits

JAPJAP diverting up to 90% of food waste to produce nutrient-rich fertiliser for plants in the country parks within 30 days. The onsite instant regeneration approach not just reduces the carbon footprint of waste transportation and storage, but also prevents organic waste from disrupting the wildlife balance in the natural landscape. The entire food waste station is constructed from recycled plastic pallets and features a modular and user-friendly design that can be seamlessly integrated in different environments, promoting a culture of environmental stewardship with minimal infrastructure. The embedded IoT sensing technology provides real-time data to precisely optimise outdoor waste management.

Technologies Applied

Our patented solution works with IoT in the BSF real-time monitoring to provide optimal environmental conditions for efficient BSF larvae bio-waste conversion. By capturing real-time environmental conditions, including temperature, moisture, light, gas composition (hydrogen sulphide, methane, ammonia), and pH, from high-sensitivity sensors, data are continuously continuously transmitted to the server built with machine learning algorithms under low-latency message queuing telemetry tracking protocol. This enables a linear electronically controlled artificial ecosystem that automatically regulates temperature, food distribution and oxygen in BSF larval containers, enabling larvae to carry out the aerobic composting process effectively, producing rich nitrogen, phosphorus and potassium organic fertiliser.

Target Users

User Profile / Persona:

The primary target users are environmentally conscious individuals, including outdoor enthusiasts, campers, hikers, and park visitors aged 20-45 years. These individuals are typically professionals and families who value sustainability and aim to minimize their environmental impact. They are characterized by a high level of environmental awareness and a commitment to green practices. Secondary target users include park management authorities and environmental organizations seeking innovative waste management solutions to reduce operational costs and promote environmental stewardship among park visitors.

User Scenario and Goals:

In Hong Kong's country parks, visitors engage in activities such as camping, hiking, and picnicking. These parks serve as popular destinations for families, groups, and individuals seeking outdoor recreation and a connection with nature. The primary goal of these users is to enjoy their outdoor experiences without contributing to environmental degradation. They aim to manage their waste responsibly, minimize their carbon footprint, and preserve the natural beauty of the parks. Park management authorities seek efficient waste management systems to maintain cleanliness, reduce waste-related disruptions to wildlife, and promote sustainable practices among visitors.