

Abstract

Automatic Monitoring of a Community Backyard Composting Program [†]

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Abstract: The increase of source-separation of bio-waste, largely represented by food waste, and their subsequent biological treatment, is essential in waste management strategy. Aerobic and biological composting of bio-waste is a process that requires experience and technical skills, thus backyard composting can be a challenging task for the average household, with failed attempts often leading to its abandonment. Here we present the development of an integrated system including a low-cost sensor, a smart phone application, and a cloud-based service that can assist in backyard composting. The system builds on the composting-as-a-service concept. Installed in a waterproof capsule, the sensor monitors temperature at the core of the compost pile and transmits the readings to a smartphone application using Bluetooth Low Energy (BLE) technology. Based on compost temperature readings and a data feed of environmental parameters, a cloud-based service provides insight on the status of the composting process and advice for manual intervention. By supplying timely information for compost pile management, the system can increase the potential for producing a high-quality compost soil amendment and therefore the probability that backyard composting is adopted by the user. In the context of the backyard composting activity of the UIA A2UFood Project, the system is tested in a community of 100 households in Heraklion, Crete, and preliminary results are presented.

Keywords: bio-waste; composting; mobile application; web-service; sensors

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