

Proposing Intelligent Insect Trap System for Their Recognition and Classification

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ABSTRACT: *The vast majority of species of insects are either totally harmless or are beneficial. There is a demand for new devices able to control the population of harmful insect. Insect have important role in human life as vector of disease. Intelligent insect trap system plan for sampling, distinguish insect based on takes picture, weigh, location and time. This system processes insect picture and context for determine type of insect. It can help researchers to find out present or absent of pests and natural enemies, abundance, activity time, population peak and insect monitoring and controlling.*

Keywords: *Intelligent trap, Classification, Context aware*

I. INTRODUCTION

Insect pests are the most numerous group of organisms, and they live in almost every conceivable niche. In addition, insects are important in other ways: Throughout the whole of human history, insects have been intimately related to our wellbeing, in both positive and negative ways. For example, insect pests consume human's food; In contrast, insects pollinate at least two-thirds of all the food consumed in the world, with bees alone responsible for pollinating one-third of this total (1). Globally, some insect like mosquito and Locust are considered among the creatures most dangerous to humans. Hundreds of thousands of people die each year from mosquito-borne diseases and in past famine had happened after invasion of locust frequently. Effective insect pest management relies on the early detection of insect pests, hopefully before they become established and cause damage (2). Regular visual inspection and trapping of vulnerable and suspect areas is valuable despite obvious limitations. Monitoring efforts should not rely solely on visual inspections of trap. Trapping should also be used with electronic sensor. However, it is an essential part of an Integrated Pest Management (IPM) strategy pest detection through trapping is just one part of an IPM program. The data from the catches can be used to give information on the pest, an indication of their numbers and seasonal cycles and where they congregate. The aim: to distinguish different insect species and whether larvae or adults insect caught in the intelligent trap, and to identify those that are especially problematic as potential hurt and disease vectors of plant. Researchers around the world will then be able to track gregarious insect even more accurately than ever before. A successful IPM program depends upon a successful monitoring program. The catch details should be noted regularly to show how numbers of insects are increasing in various locations over time (3)

This can be recorded by intelligent trap and transparent overlays on the plan by using computer database. The primary goals of monitoring are to locate and identify insect, mite and disease problems, and to observe changes in the severity of infestation. These are accomplished by climatic condition throughout the production area and by the use of intelligent traps

II. Context

Ubiquitous computing is revolutionizing the way humans interact with machines and carry out everyday tasks. Through the use of sensors, actuators and context awareness the virtual world is highly intermingled with the physical world, creating profound opportunities for enabling computationally smart spaces with automation, seamless interactions and everywhere anytime services (4). In pervasive computing environments, users may access resources and services remotely. There are different sorts of users and services and all of them are not predefined. Furthermore, context plays a crucial role in these environments and affects decision making processes significantly. Because of the users being mobile and numerous, context is a considerable factor in access control. Context is any information that can be used to characterize the situation of an entity. An entity would be a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and application themselves. Context may include date, time, location, system capabilities and other information about entities and environment (5).

III. METHOD: COLLECTING INSECT, IDENTIFYING AND EQUATIONS

Intelligent trap used context aware access control for classify insects. When an insect sit down surface, insect context information extracts and trap takes a picture it. Insect context includes weigh and location of insect. Image processing technique used to process picture. After insect picture processes, it compare with database picture and select the appropriate type for insect. Matching insect picture with database helps intelligent system to identify insect type exactly. Insect weigh compare with insect normal weigh and if these are near, precision of insect type prediction increases. Location context compare with real location insect and if these are matches, the intelligent trap can classify insect successfully. Recognition system checked insect weigh and location for increasing the prediction accuracy because each type of insect have specified weigh and belongs a special location. Therefore, recognition system or intelligent trap based on insect picture, weigh and location can predict type of insect and distinguish between possible type and impossible. This system helps researchers to classify insect systematically and exactly.

Finally, in intelligent trap three events happen. 1- Insect picture processes 2- insect context such as weigh processes 3- insect location and Time context processes. If the result of three steps is ok, type of insect determines and it classify. Fig1. Show the conceptual model of intelligent Trap.

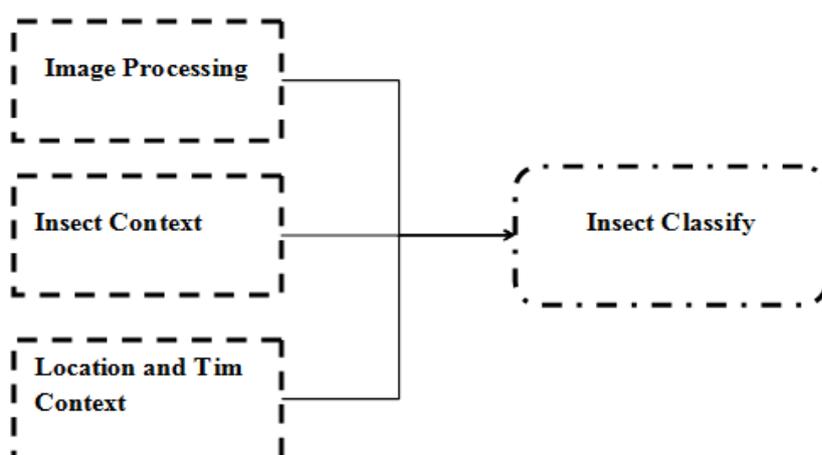


Figure 1: Conceptual Model of Intelligent Trap

IV. DISCUSSION

The traps require inspecting on a regular basis and the catch recorded. Traps should be monitored daily, weekly and monthly. Intelligent insect trap system will provide population estimate and abundance of the all insect that captured and they classification in shorter time. Estimate of species are important in understanding the spatial – temporal distribution of the insect, and serve as an alarm system for outbreaks of insect pest and disease vectors (6). Snouza et al (3) applied an intelligent sensor in structure of intelligent trap should be able to collect information about the environment and able to detect species of insect. They create that device for disease vector or agricultural pests and classify the insect species wing beat frequency, audio and phototransistors. Silva et al (6) applied machine learning and audio analysis techniques to insect recognition in intelligent trap. They perform an extensive evaluation of different feature sets from audio analysis and machine learning algorithms to construct accurate classifier for the insect classification task. This device make for vector insect like mosquito especially.

V. CONCLUSION

Insect traps are a continuous monitoring device. Data obtained by intelligent traps accurate present or absent of pests and natural enemies, abundance, activity time, population peak. It is a novel manner in IPM that helpful for entomologist for classification, monitoring and pest control. Intelligent traps very use full for sensitive place like food factory, museum and costly product in agriculture. There is a demand for new device able to control the population of harmful insect. Researchers try to make intelligent traps with lowest cost and help the farmer to management pests successfully.

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