UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DESIGN OF AUTOMATIC CAT FEEDER WITH CAT'S WEIGHT DETECTION

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Of Computer Engineering Technology (Computer Systems) With Honours.

by

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APPROVAL

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ABSTRAK

Pemberi makanan kucing automatik dengan pengesanan berat kucing adalah sebuah peranti elektronik yang boleh memberi makan kucing secara automatik dengan menggunakan beberapa komponen elektronik seperti Arduino Mega, motor, dan sensor pemberat. Pemberi makanan kucing automatik ini menggabungkan elektronik dan beberapa pengaturcaraan untuk mengawal sistem tersebut. Pemilik kucing yang jarang berada di rumah mendapati bahawa sangat sukar untuk memberi makan kepada kucing mereka kerana ia memerlukan kerja manual untuk memberi makan kucing dengan makanan kucing dan juga air. Dengan menggunakan pemberi makanan kucing automatik, maka setiap pemilik kucing tidak perlu bimbang tentang kucing mereka kerana kucing mereka akan mendapat makanan yang mencukupi walaupun pemiliknya tiada di rumah. Objektif projek ini adalah untuk merekabentuk pemberi makanan kucing automatik yang berdasarkan berat kucing. Sistem ini juga akan mengeluarkan makanan secara automatic sekiranya sensor penimbang berat mengesan berat kucing tersebut. Salah satu objektif yang telah berjaya dicapai ialah sistem ini boleh mengeluarkan makanan kucing dalam jumlah makanan yang tepat berdasarkan berat kucing. Selain itu, prototaip yang sesuai untuk projek ini telah dapat dibangunkan di mana ia dapat mempengaruhi proses mendapatkan output projek yang diinginkan. Oleh itu, sistem ini sangat berguna untuk komuniti seperti pemilik kucing di mana ia dapat membantu dalam menjadikan kehidupan mereka menjadi lebih mudah, dan ia juga dapat mengekalkan kesihatan kucing mereka.

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ABSTRACT

An automatic cat feeder with cat‟s weight detection is basically an electronic device that can automatically feed cats by using some electronic components such as Arduino Mega, servo motor and weight sensor. This automatic cat feeder combines both electronics and some programming in order to control the system. The cat owners that are away from home find it difficult to feed their cat as it takes a manual work in order to feed the cats with their kibbles and also water. With the use of this system, every cat owner does not need to worry about their cats as the cats will get sufficient amount of food even though the owner is away from home. This system automatically starts to dispense kibbles when the weight of the cat is detected by the weight sensor. This project have been developed successfully where it complies with the objectives of this projects. One of the objectives that have been reached is where this automatic cat feeder can dispense the kibbles within the right amount of food based on the weight of the cat. Besides, a suitable prototype for this project is able to be developed where it can affect the process of getting desired output of the project. Hence, this system is very useful for communities such as cat owners where it can help in making life easier and also can maintain the health of the cat.

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DEDICATION

A very special dedication to my mother, my family, my special friend, supervisor, lecturers and also my friends who have contributes in giving such a wonderful and positive vibes during the completion of this project.

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LIST OF SYMBOLS

g	-	Gram
kg	-	Kilogram

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LIST OF ABBREVIATIONS

GSM	Global System for Mobile
IoT	Internet of Things
GPS	Global Positioning System

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Pet owning has been increasing steadily around the globe. The United States, which has the most population in the world, estimated to have 78 million dogs and 85.8 million cats being owned. According to (Litchfield *et al.* 2017), animals that have been companion for human for almost thousands of years and also popular as pets in Australia, New Zealand, Europe, North America and elsewhere are basically came from the domestic cats. In Malaysia, statistics have shown that the most common domestic pets in the household are cats and dogs. Some household also kept birds, rabbit or even mice as pets. The numbers of households in Malaysia that have pets have been increasing throughout the years. There are numerous stray cats and dogs that have been adopted into the household.

It is undeniable that every pet owner should have a proper management of their pets. Every pet owner has their own responsibilities in taking care of their pet which includes giving a safe environment shelters, feeding, healthcare and also companionship. The cats can be a perfect pet in a household. Cats are undeniable can easily be adapted to the surrounding especially the humans. Besides dogs, cats are also one of the animals that are devoted to their owners. They can communicate with their owners as well which gives a companion to the cat owners. Cats as a companion literally gave many benefits, especially to the cat owners. Studies have also shown that the presence of pets has been associated with the reduction of stress and blood pressure

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and therefore may reduce the risk of cardiovascular diseases (Qureshi et al. 2009). Besides, (Edwards et al. 2018) made a study researchers that demonstrated attachments that formed by cats to their owners are similar to the way of infants get attached to their parents. On the demonstration study that has been made, the kittens in the study were more relaxed and desired to explore an unfamiliar environment when the owners are with them in the area.

Thus, choosing cat as pet is literally the most perfect decision to be made. Before getting a pet, either by adopting or buying cat, every cat owner should take consideration especially the proper feeding management. Proper feeding management includes in taking a serious view on cat nutritional diet. Proper diet for cat leads to a healthy cat and can also able to prevent cats from getting diseases. Feeding a cat can be easier with the help of technology. Nowadays, it is an undeniable fact that of human activity are mostly being replaced by some method involving technology. Thus, this project focuses on designing a more reliable cat feeder that can help in managing cat feeding. This automatic cat feeder helps in solving the problems that are related to the existing pet systems that have been developed.

1.1 Project Background

Pets are defined as the animals that are not dangerous or known as tame animal which is kept by an owner as a companion in their home. There are many types of tame and domestic animals that can be kept as pet such as dogs, cats, rabbits, bird and many more. Being a pet owner means having a responsible to commit to the pets and responsible for taking care of the pet for its entire life. Pets are usually chosen by a pet

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owner that is suitable for their lifestyle since owning a pet is basically a long-term commitment to be done. Some pets, such as dogs or cats need to have more attention because they are usually pets that are being let to freely move inside the house. The dogs and cats can be trained such as littering inside the litter box, feeding time, grooming or bathing. There are also pets that can literally make noise in the house such as birds. Besides, there are also some pets that are meant to be placed inside a cage only. Thus, choosing the most suitable pets based on lifestyle and surrounding is very important for every pet owner.

In Malaysia, at least one pet is owned in every household nowadays. The number of households having pets have been increasing these days, includes those who lived in apartments or condominium. Cats are one of the pets that mostly owned by Malaysian. The lifespan of cats or dogs are nearly 18 years. Thus, having a cat or dog as pet is a very tough and long term commitment. Feeding a cat has been one of the regular routines that every pet owner do. Keeping a healthy lifestyle for the cat is important as it may affect the cat health and prevent them from getting diseases. Besides, unhealthy cat may also affect the owner health as some diseases may cause by viruses that can attack human.

Various pet feeder machines have been developed previously which helps some pet owner to feed their pet regularly without feeding their pets manually. There are various pet feeder systems that have different features implemented in it. Some pet feeder system used a timer to feed the pet regular. Some pet feeder system used sensor such as IR sensor which detect the motion of pet. The pet feeder will works if it detects any presence of pet near the sensor, thus it will dispense the food to the pet. All these developed systems have been used in real life which definitely gave benefits to every

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pet owner. The pet system that have been developed by (Berhan et al. 2015) implements a feature inside the system where the cat foods are dispensed to the cat within a programmable time. While, another pet feeder that have been developed by (Singh et al. 2015) implements a new advance feature that use a GSM module as the remote controlled for the pet feeder machine. Within few years, there are more new systems that were built by innovating and improvise the previous developed systems.

Thus, several related major and also minor problems have been identified based on all the previously researched of the developed pet feeder systems. These related problems are also studied in order to improve on the previous developments. Some major problem regarding the pet feeder system is that most of the system dispensed the food to the pet without implementing the right nutrition and dietary for pet. Pet especially cats, should be feed regularly within its dietary and right nutrition. In this project, this feeder system is focused on cats and the nutritional information regarding cat‟s diet is studied.

Besides, most of the pet systems invented and sold in market nowadays are mostly using timer which literally it not very suitable for cats. Besides, the portion of the kibbles to be fed is customable by owners. Therefore, not all cats are suitable with the same amount of kibbles fed. Cats should be fed with nutrition food with suitable range of food based on its weight.

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