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ABSTRACT

(IoT) attempts to help people Internet-connected devices, applications, and services anytime and anywhere. However, how providing an efficient and intuitive method of interaction between people and IoT devices is still an open challenge. In this paper, we propose a novel interaction system called *Watch & Do*, where users can control an IoT device by gazing at it and doing simple gestures. The proposed system mainly consists of: 1) object detection module; 2) gaze estimation module; 3) hand gesture recognition module; and 4) IoT controller module. The target device is identified by various deep learning-based gaze estimation and object detection techniques. Afterwards, hand gesture recognition is applied to generate an IoT device control command which is transmitted to the IoT platform. The experimental results and case studies demonstrate the feasibility of the proposed system and imply the future research directions.

TABLE OF CONTENTS

CHAPTER No	TITLE	PAGE
	ABSTRACT	1
	LIST OF FIGURES	4
1	**INTRODUCTION**	5
	1.1About the Project	5
2	**SYSTEM ANALYSIS**	6
	2.1Existing system	6
	2.2Proposed system	6
	2.3Literature survey	7
3	**REQUIREMENTS SPECIFICATION**	**9**
	3.1Introduction	9
	3.2Hardware and Software specification	10
	3.3Technologies Used	11
	3.3.1Python	11

	3.3.3.1Introduction to Python	12
4	DESIGN AND IMPLEMENTATION	34
	4.1 Constraint in analysis	34
	4.2 Constraint in design	35
	5.1Architecture Diagram	36
6	**SYSTEM DESIGN – DETAILED**	**44**
	6.1 Steps of process	44
	6.2 Steps explanation	44
7	**CODING AND TESTING**	**45**
	7.1Coding	45
	7.2Coding standards	45
	7.3Test procedure	47
	7.4Test data and output	48
	SOURCE CODE	**56**
	SNAP SHOTS	**60**
	PAPER WORK	**61**
	REFERENCE	**62**

LIST OF FIGURES

FIGURE NO	FIGURE NAME	PAGE NO
	System Design	36
	Sequence Diagram	38
	Use Case Diagram	40
	Activity Diagram	42
	Collaboration Diagram	43

CHAPTER 1

INTRODUCTION

To detect target device is identified by various deep learning-based gaze estimation and object detection techniques and user can control the target IOT device by hand gesture.

The Internet of Things (IoT) attempts to help people access internet-connected devices, applications, and services anytime and anywhere. However, how providing an efficient and intuitive method of interaction between people and IoT devices is still an open challenge. In this work, we propose a novel interaction system called Watch & Do, where users can control an IoT device by gazing at it and doing simple gestures. The proposed system mainly consists of four categories: 1) object detection module, 2) gaze estimation module, 3) hand gesture recognition module and IoT controller module. The target device is identified by various deep learning-based gaze estimation and object detection techniques. Afterwards, hand gesture recognition is applied to generate an IoT device control command which is transmitted to the IoT platform. The experimental results and case studies demonstrate the feasibility of the proposed system and imply the future research directions.

CHAPTER 2

SYSTEM ANALYSIS

EXISTING SYSTEM

The target device is identified by various Algorithms are used for gaze estimation and object detection techniques. Afterwards, hand gesture recognition is applied to generate an IoT device control command which is transmitted to the IoT platform. These algorithms results are not accuracy. The experimental results and case studies demonstrate the feasibility of the proposed system and imply the future research directions.

PROPOSED SYSTEM

Proposed system works as follows. First, the Watch module records the opposite side of the user to detect and recognize the types of IoT devices installed in the room. Second, the Watch module detects the user‟s head region and then computes a fine-grained head pose information (i.e., pitch, yaw, and roll) to estimate the user‟s gaze position. With this information, the proposed system can identify the target device. Then, the Do module captures the user‟s hand gestures. A combination of hand gesture information and the type of selected IoT device is then translated into an IoT command and transmitted to IoT platforms. The target device is identified by deep learning Algorithms are used for gaze estimation and object detection techniques.

LITERATURE SURVEY

Charith perera [1] proposed content aware for computing fot internet of things and Understanding sensor data is one of the main challenges that the IoT would face. This vision has been supported and heavily invested by governments, interest groups, companies, and research institutes.The IoT has gained significant attention over the last few years. With the advances in sensor hardware technology and cheap materials, sensors are expected to be attached to all the objects, Understanding sensor data is one of the main challenges that the IoT would face. This vision has been supported and heavily invested by governments, interest groups, companies, and research institutes.The IoT has gained significant attention over the last few years. With the advances in sensor hardware technology and cheap materials, sensors are expected to be attached to all the objects.

Luigi atzori [2] proposed a theory Each IoT element so as to make it possible to reach them from any other node of the network, looks more suitable for the traditional Internet paradigm.The IoT has the potential to add a new dimension to this process by enabling communications with and among smart objects, thus leading to the vision of „„anytime, anywhere, any media, anything" communications. Technologies make the IoT concept feasible but do not fit well with the scalability and efficiency requirements.It is emphasized that „„to the extent that everyday objects become information security risks, the IoT could distribute those risks far more widely than the Internet has to date".

Chuyu Wang[3] proposed multi touch in air device free finger tracking and guesture recognisationGesture recognition has gained considerable attention in emerging applications to provide a better user experience for human-computer interaction.Experiments validate that RF-finger can achieve as high as 88% and 92% accuracy for finger tracking and multi-touch gesture recognitionThese solutions are either easily affected by the environmental noise or incapable of sensing fine-grained gestures at the finger level.We experimentally investigate the impact of tag array deployment on the signal quality.

Nataniel Ruiz Eunji Chong [4] proposed fine grain head pose We show that a multi-loss deep network can directly, accurately and robustly predict head rotation from image intensities.Landmark-to-pose methods are studied in this work to show their dependence on extraneous factors such as head model and landmark detection accuracy.Head pose recovery inherently is a two step process with numerous opportunities for error.Generic head models can introduce errors for any given participant, and the process of deforming the head model to adapt to each participant requires significant amounts of data and can be computationally expensive.

Gururaj Kulkarni [5] proposed enabling technologies protocols IoT has potential to broaden its horizon by enabling communication between smart objects. IoT will change everything drastically if implemented successfully,We presented some handsome application of IoT and its comfort in life. Some important issues that needed to be resolved have been discussed before wide acceptance of this technologyThere are various issues which need thorough research to improve the quality of life.An overview of IoT technologies, protocols and applications and related issues with a comparison of other papers.

Arkady Zaslavsky [6] proposed symatic driven configuration we have introduced the CASCoM approach that allows non-IT experts to configure IoT middleware efficiently and effectivelyOur model supports single-click configuration by eliminating sequences of manual activities needed to be carried out by users otherwise, the problem we addressed in this paper is comprehensively analyzed and presented with use-case scenarios in detail,Our objective is to automate and simplify the configuration of an IoT middleware and improve its usability so non-IT experts can use it efficiently and effectively

CHAPTER 3

REQUIREMENT SPECIFICATIONS

INTRODUCTION

THE RECENT developments in network infrastructure and smart devices have resulted in the rapid spread of the Internet of Things (IoT) applications and services. The IoT is defined as a network of Internet-connected things (e.g., computers, vehicles, and sensors) that exchange data and information among themselves with and other services [1]. The number of Internet-connected devices is now dramatically growing. According to a recent study on the prediction of IoT market share, the number of IoT devices will approach 100 billion and the total amount of data generated by the users and devices will reach 35 ZB by 2020 [2]. It is therefore expected that the success of IoT will allow the users and things to be connected anytime, anywhere using any path, network, or service [3]. These characteristics of the IoT ecosystem will improve the quality of services in various application domains such as health-care (e.g., remote patient monitoring and treatment), transportation (e.g., smart transportation systems), and home automation (e.g., smart appliances). A typical architecture of the IoT comprises a perception layer, a network layer, and an application layer [4]. Numerous studies have been conducted to address the challenging issues in each layer of the architecture. The perception layer first interacts with physical devices like RFID [5], sensors, and actuators and then connects the devices to the network of IoT. The network layer of the IoT is responsible for transmitting data between different things, applications, and services using heterogeneous networks and communication protocols. Finally, the application layer exploits the data from the underlying layers to build and provide the required services. Interoperability of IoT devices, applications, services, and users is an important factor for the successful implementation of IoT. Therefore, the network layer and its corresponding technologies (e.g., Bluetooth [6], Wi-Fi [7], 6LoWPAN [8], ZigBee [9], Z-Wave [10], MQTT [11], and CoAP [12], etc.) have been usually considered the most important components since they are closely related to the connectivity, interoperability, and scalability of IoT architectures. Similarly, the IoT standards [13], [14], frameworks [15]-[17], and platforms in the application layer aim to maximize the interoperability by abstracting the layers of the IoT architecture and providing an efficient user interface (UI).

HARDWARE AND SOFTWARE SPECIFICATION

HARDWARE REQUIREMENTS

- Hard Disk : 500GB and Above
- RAM : 4GB and Above
- Processor : I3 and Above
- Webcam - 2
- Arduino UNO, Gesture Sensors, relay circuit board

SOFTWARE REQUIREMENTS

- ✓ Operating System : Windows (64 bit)
- ✓ Software : Python and Anaconda
- ✓ Tools : Jupyter Note Book and Spyder IDE