1122200377

國立勤益科技大學講座推薦表

申請日期： 112年 3 月 15 日

推薦單位 (校長推薦由秘書室辦理)	電機工程系	推薦層級	☑系(自薦) □院　□校長
被推薦(自薦)人 姓名	宋文財	教授證號	教字第 021643 號
專長領域	物聯網相關應用	教授年資起算日	103年 8月 1 日
現職	電機工程系特聘教授		
推薦講座種類	☑專任講座 □專職講座 □兼職講座 □榮譽講座	校長推薦時擬設置單位	

資格條件（本校講座設置辦法第3條第1項所列8款，請勾選其中之一）：

□**一、諾貝爾獎得獎人。**

獲獎年度：_____(西元)年，獲獎種類：□物理　□化學　□生理學或醫學　□文學　□和平　。

□**二、中央研究院院士或國際知名之國家級院士。**

名稱：_____，獲獎年度_____年(西元)。

□**三、曾獲總統科學獎或行政院傑出科技貢獻獎者。**

獲獎年度：_____年(民國)。

□**四、曾獲得教育部學術獎或國家講座者。**

名稱：_____，獲獎年度_____年(民國)。

□**五、曾獲國際著名大學之講座教授。**

大學名稱：_____，獲聘年度_____(西元)。

□**六、曾獲得國內外重要學術獎勵者。**

獎勵名稱：_____，獲獎年度_____年(西元)。

□**七、重要國際學會會(院)士。**

重要學會名稱：_____，獲聘年度_____(西元)。

☑**八、在學術上或專業領域上有傑出貢獻或聲望卓著者。**

檢附資料：

一、符合上述資格條件一至二款其中之一者：

(一)學經歷(具5年以上合格教授證書)　(二)近5年著作目錄(自行表列)

(三)具體學術成就證明(獲獎證明文件)

二、**符合上述資格條件第三款至第八款其中之一者，除上述資料外，請依所推薦講座之種類，檢附下列資料，由推薦單位會辦研究發展處認定，其認定基準見附註。**

(一)☑專任講座：下列各款擇一提列並勾選

1. ☑前一年度以本校名義為第一作者或通訊作者發表 SCI 等級論文12篇以上(其中名列第1作者篇數應達6篇以上)。
2. □產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)任計畫主持人或共同主持人之計畫金額採計，其前一年度計畫金額累計至少應達新台幣1200萬元以上。

(二)□專職講座：下列各款擇一提列並勾選

1. □前一年度為第一作者或通訊作者發表或接受 SCI 等級論文12篇以上(其中名列第一作者篇數應達6篇以上)。
2. □產學合作計畫、中央各部會計畫(含有行政管理費)、技術移轉金(技轉金績效不得重複認列)任計畫主持人之計畫金額採計，其前一年度計畫金額累計至少應達新台幣1,200萬元以上。

(三)□兼任講座：

□首次推薦：前一年度為第一作者或通訊作者發表或接受 SCI 等級論文6篇以上(其中名列第一作者篇數應達4篇以上)。

□再次推薦：前一年度為第一作者或通訊作者發表或接受 SCI 等級論文6篇以上(其中名列第一作者篇數應達4篇以上且至少須有2篇以本校名義發表)。

履行義務具體說明

(依講座設置辦法第8條規定，續聘時填列，新推薦者免填)

一、聘任期間：　年　月　日至　年　月　日，每學年至少一次校內演講，聘期內共辦理＿＿＿＿次，辦理日期如下：

二、兼任講座授除上述演講外，並輔導本校特色發展專案計畫，名稱如下：

申請推薦人簽名：宋文財(※由推薦單位主動推薦者，免填)

推薦單位主管	研究發展處
經查被推薦人具講座設置辦法第第3條所定積極資格且未具同條所定消極資格，被推薦案件審理期間如經檢舉查證有消極資格情事屬實願撤回推薦，絕無異議。 電機工程系 主任 卜文正 112.3.23 電資學院 院長 楊勝智 112.3.21 (由系所推薦時，仍請送所屬學院院長核章)	☑本案依講座設置辦法第3條之積極資格條件認定合符。 □本案認定不合符。原因：＿＿＿＿＿＿ 校務基金運用行政組員 范孟育 112.3.23 研究發展處學術發展組組長 陳凱榮 研究發展處 處長 葉彥良 3/29
人事室	校長核示

□本案屬講座設置辦法第3條第1項第1款至第3款其中之一，奉核後聘任，並於校教評會列入工作報告備查。 ☑本案屬講座設置辦法第3條第1項第4款至第8款其中之一。 人事室專員楊雅筑 05/31　人事室主任鍾家政 05/31	□屬講座設置辦法第3條第1項第1款至第3款其中之一，逕行聘任，並送校教評會備查。 ☑屬講座設置辦法第3條第1項第4款至第8款其中之一，提相關會議審議。 2023.04.06

系教評會 （院、校級推薦，免填）	年　月　日　學年度　學期　次教評會審議通過(附會議紀錄)。　召集人核章：
學院教評會 （校級推薦，免填）	年　月　日　學年度　學期　次教評會審議通過(附會議紀錄)。　召集人核章：
校教評會	年　月　日　學年度　學期　次教評會審議通過(附會議紀錄)。　召集人核章：
校長核定聘任	

附註1. 依本校講座設置辦法第3條第4項、第5項規定如下：

第3條第4項：有關SCI論文與第一作者及通訊作者定義列述如下：

一、SCI等級論文：須發表論文於SSCI、SCI、SCIE、A&HCI收錄 期刊(不含收錄於前述資料庫之研討會論文，如Conference article、Proceedings、Book series、Lecture notes及Editorial Material等)，且以申請表所附資料庫ISI查詢網址中明列之發表日期(須有完整期數與頁碼)為判斷依據，須符合該論文收錄至Web of Science(或該期刊持續收錄至Web of Science)且該期刊可於JCR資料庫檢索。

二、講座教授本人須為論文之第一作者或通訊作者；第一作者，以獨立創作發表或共同合著發表時依論文排版之作者群排序名列最上方、最左方算起第一名認列之；通訊作者則應符合：(一)以名列作者群前三名為限；(二)通訊作者二名以上，應為自左方算起第一位始得認列之。同篇期刊論文僅能由一位教師提出申請，且每篇期刊論文限申請一次，如通訊作者標示不清，請提供接受函或與編輯者通信證明。

第3條第5項：產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)須任計畫主持人之計畫；若擔任他校之共同主持人，需有計畫經費(應含行政管理費)納入本校，其金額(依核定清單、核定公文或契約書金額)採計不含校補助款。產學合作計畫及中央各部會計畫以結案日期為主(依核定清單或契約書之期間規定，計畫展延期間不予採計)；技術移轉則以簽約日期為主。

附註2. 依校教評會109年7月15日決議，專任講座之被推薦人於109年7月以前(1月1日至7月31日)產出之績效條件，仍按109年7月9日發

布實施前之原設置辦法規定採計，109年8月以後之績效，則按現行已發布實施之新規定採計。

10908以後現行規定標準	10907以前採計標準(1090101-0731)
一、專任講座教授：前一年度以本校名義為第一作者或通訊作者發表SCI等級論文十二篇以上(其中名列第一作者篇數應達六篇以上)；**或以產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)**任計畫主持人**或共同主持人**之計畫金額採計，其前一年度計畫金額累計至少應達新台幣一千二百萬元以上。	一、專任講座教授：前一年度以本校名義為第一作者或通訊作者發表SCI等級論文十二篇以上(其中名列第一作者篇數應達六篇以上)；如以產學合作計畫(含有行政管理費之中央各部會計畫)任計畫主持人之計畫金額採計，其前一年度計畫金額累計至少應達新台幣一千二百萬元以上。
有關「績效獎勵金」之核算，依下列各款規定，其中SCI論文與第一作者及通訊作者定義，依第三條第四項規定；有關產學合作計畫、中央各部會計畫(含有行政管理費)、以本校名義進行之技術移轉金(技轉金績效不得重複認列)任計畫主持人**或共同主持人**之計畫之認定，依第三條第五項規定辦理。 一、專任講座教授：依第三條第三項第一款以本校名義所發表之SCI等級論文，列第一作者每篇頒給績效獎勵金三萬元，列通訊作者(採計篇數不得超過第一作者篇數)每篇頒給績效獎勵金二萬元；若講座教授於論文中作者數超過五名以上或講座教授掛名單位超過三個以上，則該篇論文獎勵金不予採計。如以產學合作計畫、中央各部會計畫(含有行政管理費)及以本校名義進行之技術移轉金(技轉金績效不得重複認列)任計畫主持人或共同主持人之計畫金額採計，其前一年度產學合作計畫累計金額達一千二百萬元者，頒給績效獎勵金新台幣三十六萬元，嗣後累計每超過一百萬元增給績效獎勵金三萬元。	有關「績效獎勵金」之核算，依下列各款規定，其中SCI論文與第一作者及通訊作者定義，及有關產學合作計畫(含有行政管理費之中央各部會計畫)任計畫主持人之計畫之認定，依第三條**第三項、第四項**規定辦理。 一、專任講座教授：依第三條第二項第一款以本校名義所發表之SCI等級論文，列第一作者每篇頒給績效獎勵金三萬元，列通訊作者(採計篇數不得超過第一作者篇數)每篇頒給績效獎勵金二萬元。以產學合作計畫(含有行政管理費之中央各部會計畫)任主持人之計畫金額採計，其前一年度產學合作計畫累計金額達一千二百萬元者，頒給績效獎勵金新台幣三十六萬元，嗣後累計每超過一百萬元增給績效獎勵金三萬元。

教字第 021643 號
REG.NO.:021643

教授證書

Professor Certificate

宋文財　　身分證字號：C120086723 中華民國58年2月20日生
由國立勤益科技大學送審並經本部依專科以上學校教師資格審定辦法
審定合於教授資格，年資自103年8月起計

Mr.WEN-TSAI SUNG's professional request for qualification review for Professor at National Chin-Yi University of Technology has been granted in accordance with the Accreditation Regulations Governing Teacher Qualifications at Institutions of Higher Education.Mr.SUNG's qualification will be effective beginning on August 1,2014.

WEN-TSAI SUNG
ID Number:C120086723
Date of Birth:February 20,1969

部長 吳思華

Se-Hwa Wu
Minister of Education
Republic of China (Taiwan)

中華民國 103 年 12 月 01 日

國立勤益科技大學
National Chin-Yi University of Technology

聘　書

勤益科大聘專字第 11001036 號

敬　聘

宋文財先生為本校電機工程系專任教授，聘期自一一0年八月一日起，至一一二年七月三十一日止。(從聘單位：前瞻電資科技研究所)

此　聘

校長 黎文卿

中　華　民　國　一一0　年　　月　　日

申請績效內容表列(請檢附佐證)

一、SCI 期刊(若欄位不足，請自行增加)

編號	作者屬性	合著者依序詳列所有作者(通訊請以*1、*2加註)	發表年/月	論文名稱	期刊名稱	卷數 vol	期數 no	頁碼	論文屬性	研發處核符註記	備註
1	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Ching-Hao Weng, Sung-Jung Hsiao*	111/12	Smart Greenhouse Control via NB-IoT	Intelligent Automation & Soft Computing	34	3	1971-1988	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
2	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Sung-Jung Hsiao*	111/12	Intelligent Measurement and Monitoring by Integrating Fieldbus and Robotic Arm	Intelligent Automation & Soft Computing	34	3	1737-1753	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
3	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Sung-Jung Hsiao*	111/10	Home Monitoring of Pets Based on AIoT	Computer Systems Science and Engineering	43	1	59-75	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
4	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Ihzany Vilia Devi Sung-Jung Hsiao*	111/8	Smart Lamp using Google Firebase as Realtime Database	Intelligent Automation & Soft Computing	33	2	967-982	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
5	☐第一作者 ☑通訊作者	Sung-Jung Hsiao, Wen-Tsai Sung*	111/7	Blockchain-based Supply Chain Information Sharing Mechanism	IEEE Access	10		78875–78886	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	

6	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Ihzany Vilia Devi, Sung-Jung Hsiao*, Fathria Nurul Fadillah	111/6	Smart Garbage Bin Based on AIoT	Intelligent Automation & Soft Computing	32	3	1387 - 1401	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
7	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Shuo-Chen Tasi, Sung-Jung Hsiao*	111/6	Aquarium Monitoring System Based on Internet of Things	Intelligent Automation & Soft Computing	32	3	1649 - 1666	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
8	☐第一作者 ☑通訊作者	Sung-Jung Hsiao, Wen-Tsai Sung*	111/6	Improving Particle Swarm Optimization Analysis Using Differential Models	Applied Sciences	12	11	1-21	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
9	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Sung-Jung Hsiao*	111/4	RFID Positioning and Physiological Signals for Remote Medical Care	Computer Systems Science and Engineering	41	1	289-304	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
10	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Ihzany Vilia Devi, Sung-Jung Hsiao*	111/3	Early warning of impending flash flood based on AIoT	EURASIP Journal on Wireless Communications and Networking	2022	1	1-18	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
11	☐第一作者 ☑通訊作者	Chin-Tan Lee, Wen-Tsai Sung*	111/3	Controller Design of Tracking WMR System Based on Deep Reinforcement Learning	Electronics	11	6	1-20	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	

12	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Sung-Jung Hsiao*	111/2	Utilizing the Improved QPSO Algorithm to Build a WSN Monitoring System	CMC-Computers, Materials & Continua	70	2	3529 - 3548	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
13	☑第一作者 ☐通訊作者	Wen-Tsai Sung, Sung-Jung Hsiao*	111/2	Employing a Fuzzy Approach for Monitoring Fish Pond Culture Environment	Intelligent Automation & Soft Computing	31	2	987-1006	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
14	☑第一作者 ☐通訊作者	Wen-Tsai Sung Sung-Jung Hsiao*, Chung-Yen Hsiao	111/2	Constructing a Deep Image Analysis System Based on Self-Driving and AIoT	Intelligent Automation & Soft Computing	31	2	1223 - 1240	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	
15	☐第一作者 ☑通訊作者	Sung-Jung Hsiao, Wen-Tsai Sung*	111/2	Using Mobile Technology to Construct a Network Medical Health Care System	Intelligent Automation & Soft Computing	31	2	729-748	☐SSCI ☐SCI ☑SCIE ☐A&HCI	核符	

Intelligent Automation & Soft Computing
DOI: 10.32604/iasc.2022.026927
Article

Tech Science Press

1

Smart Greenhouse Control via NB-IoT

Wen-Tsai Sung[1], Ching-Hao Weng[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
Received: 06 January 2022; Accepted: 17 February 2022

Abstract: The Internet of Things (IoT) has flourished in recent years, which brings convenience to people's lives, improves the quality of life, allows more effectively managing and maximizing benefits in industry, and improves weather predictions as the impact of global warming has complicated traditional methods to infer the weather. To this end, agriculture has also given more attention to greenhouse cultivation. In the early days of industrial research, Wi-Fi and ZigBee were used as short-or medium-distance communication technologies for transmissions in the network layer of the IoT architecture. Instead of long-distance communication technologies, such as LoRa and NB-IoT, the features of low power consumption and low cost are also more favored by the industry. This article uses the NB-IoT communication module with various sensors to monitor and control a small smart greenhouse, and the data sensed on the network platform is visually presented and recorded. On one hand, the control matches the NB-IoT communication module with the relay module. The fan, LED light, and motor can be controlled by the conditions set on the network platform. Therefore, a smart greenhouse with bidirectional control is realized.

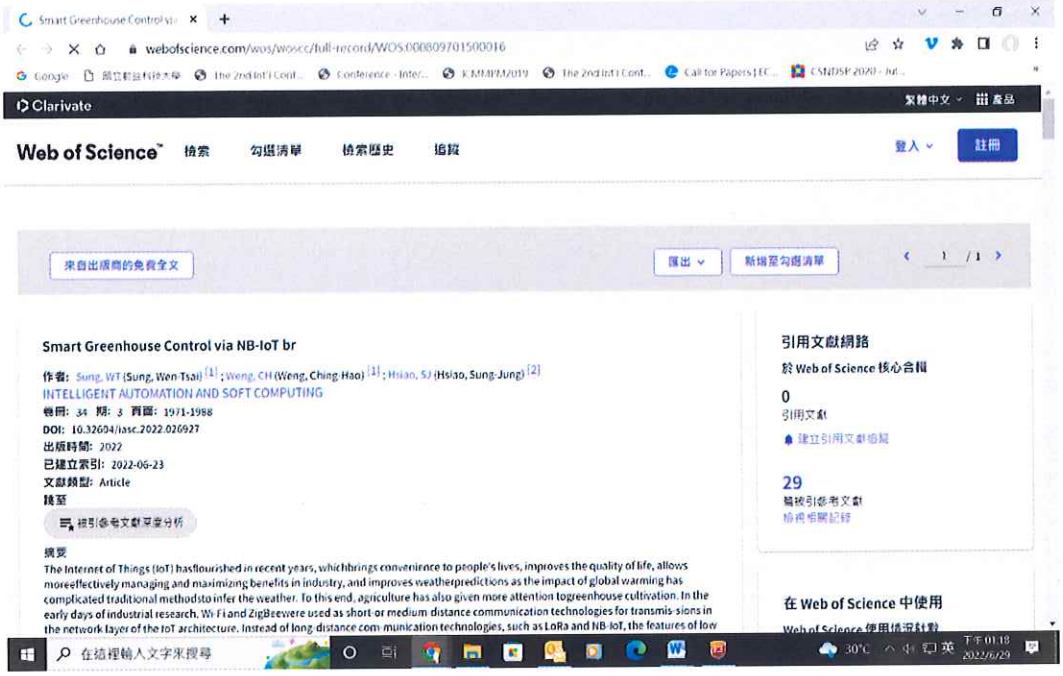
Keywords: Internet of thing; NB-IoT; greenhouse; WI-FI; ZigBee

1 Introduction

Under the development of the global Industry 4.0, many industries have gradually shifted from labor-intensive to intelligent development. Intelligent services have been introduced under this development, which includes monitoring systems, crop and consumer data collection and analysis, and automatic farming applications. Assisting the industry to conduct more precise management to pursue more efficient production, reduce costs, and ensure food safety has pushed safer agricultural environments as the initial development of smart agriculture in recent years [1].

The Taiwan Trends Research conducted a market survey on Taiwan's agricultural smart application in 2018, as shown in Fig. 1a. For the industry, the related applications of monitoring systems are the most highly regarded, and agricultural workers rate this as an important application service. The data collection, production and sales history, and water management are also highly valued. However, the part that introduced smart applications to assist crop production is still a minority. The industry believes that the

Smart Greenhouse Control via NB-IoT br



Intelligent Automation & Soft Computing
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Article

Tech Science Press

Intelligent Measurement and Monitoring by Integrating Fieldbus and Robotic Arm

Wen-Tsai Sung[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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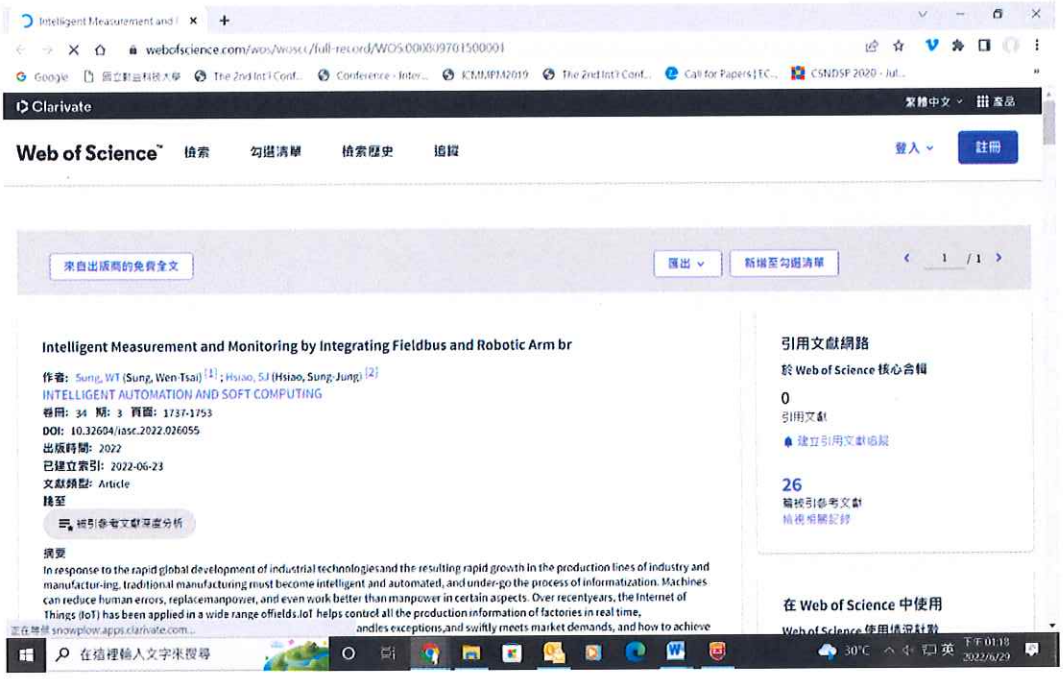
Abstract: In response to the rapid global development of industrial technologies and the resulting rapid growth in the production lines of industry and manufacturing, traditional manufacturing must become intelligent and automated, and undergo the process of informatization. Machines can reduce human errors, replace manpower, and even work better than manpower in certain aspects. Over recent years, the Internet of Things (IoT) has been applied in a wide range of fields. IoT helps control all the production information of factories in real time, and accordingly, reduces labor cost, improves quality, efficiently handles exceptions, and swiftly meets market demands, and how to achieve such a goal is a focus of current studies. This study proposes an IoT-based communication system that can monitor the operations of robotic arms and return data to users through a system interface in real time. This communication system is based on Fieldbus as the system architecture, and utilizes HIWIN Company (HI-tech WINner) Robot System Software (HRSS) and an electric gripper's intelligent measurement function to collect and analyze data. On this basis, this study efficiently determines whether the quality of products meets the standard, and uses the Weintek human-machine interface to remotely adjust robotic arms to achieve intelligent monitoring.

Keywords: Internet of things; fieldbus; HIWIN robot system software (HRSS); weintek man-machine interface; modbus

1 Introduction

Industry 4.0 was first proposed by Germany, and to date, Industry 4.0 has not completely replaced Industry 3.0, as it is still in the transition period from Industry 3.0 to Industry 4.0. The German government expects to maximize production automation in the next 10 to 15 years with the IoT and big data as core technologies of Industry 4.0, and replace more and even all manpower with robots, in order to ultimately achieve "unmanned factories". IoT is generally defined as collecting data for big data analysis by combining systems and machines, and the corresponding results are used to make business transformations or decisions, and to achieve intelligent industrial operation. Nowadays, industry and manufacturing are transitioning to automated production. Industry 4.0, which is a German strategic

Intelligent Measurement and Monitoring by Integrating Fieldbus and Robotic Arm br



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Article

Tech Science Press

Home Monitoring of Pets Based on AIoT

Wen-Tsai Sung[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung City, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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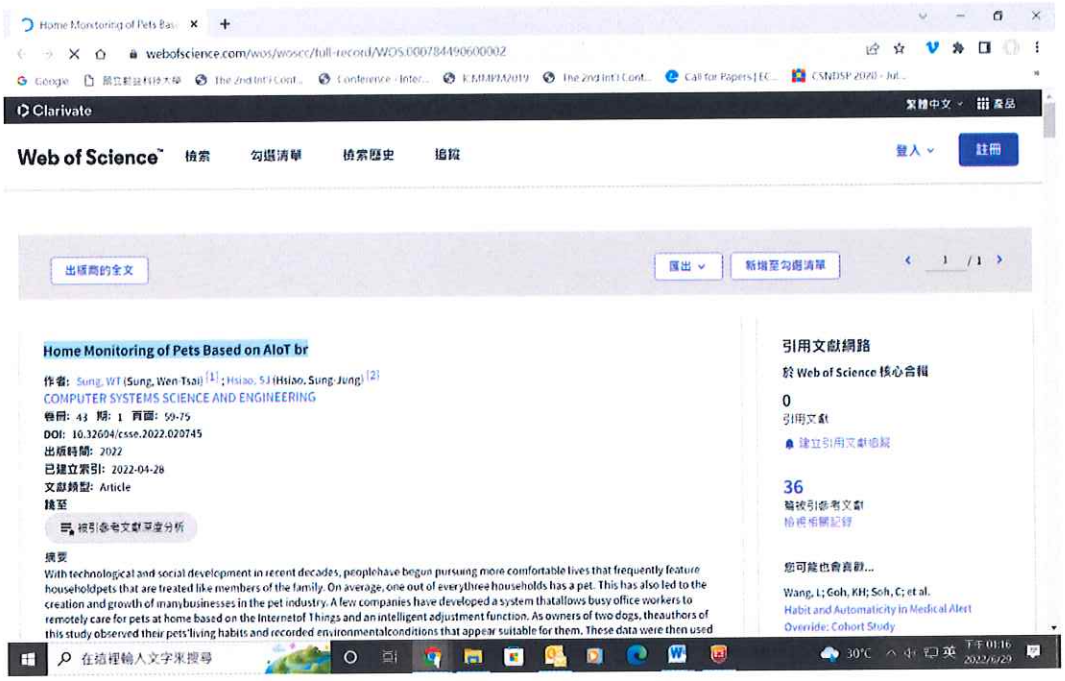
Abstract: With technological and social development in recent decades, people have begun pursuing more comfortable lives that frequently feature household pets that are treated like members of the family. On average, one out of every three households has a pet. This has also led to the creation and growth of many businesses in the pet industry. A few companies have developed a system that allows busy office workers to remotely care for pets at home based on the Internet of Things and an intelligent adjustment function. As owners of two dogs, the authors of this study observed their pets' living habits and recorded environmental conditions that appear suitable for them. These data were then used to develop an automatic control system to care for pets. The observational data on the pets' habits and environment were written in a program in Arduino by using the ESP8266 Wi-Fi module. The module and booster module control is the switch and setting of various household appliances. According to the loop setting of the program, the system does not need to manually switch or adjust the electrical settings of the environment. Instead, the pet's living environment is assessed by using various sensors. The use of Arduino programs helps develop a system that can automatically adjust the environment to one that is most suitable for the pet's comfort.

Keywords: Remote medical care; active RFID; positioning; physiological signal

1 Introduction

With the changes in people's lifestyle and social structures across the world in recent decades, many young people now choose to keep pets instead of raising children [1]. In the past, dogs were kept as pets mainly to protect the household from theft and the livestock from wild animals. Nowadays, however, pets are kept mainly as companions. There is one pet for every three households on average [1]. The pet industry has flourished as a consequence, as is evidenced by the ubiquity of animal hospitals and pet stores. This paper discusses the impact of the environment on pets based on long-term observations when their owners are away. We use the reactions of pets and the quality of their skin to determine the most suitable living environment for them, and use these observations to establish a home pet monitoring system. Most office workers do not have flexible working hours, and thus can only attend to their pets

Home Monitoring of Pets Based on AIoT br



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Article

Tech Science Press

Smart Lamp Using Google Firebase as Realtime Database

Wen-Tsai Sung[1], Ihzany Vilia Devi[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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Abstract: Along with modernization in Indonesia, electricity users often do not realize that electrical energy is still used from electronic devices left on and unused. Much electrical energy is wasted due to unwise use. Modernization requires creative automation. This significantly minimizes the amount of human labor needed to complete the job. Energy efficiency is critical due to environmental concerns and limited research on alternative renewable energy sources. When evaluating the impact of technology on the environment, energy is an essential factor to consider. Most big cities and provinces in Indonesia still use conventional lighting systems where electricity users manually turn on and off lights. Current lighting systems combine compact fluorescent lamps (CFLs) with integrated high-pressure sodium lamps to provide illumination. However, average utilization generates high demand, and more than 40% of the total energy generates waste electricity. That's why the smart lamp is one of the technologies that people are looking for to innovate on existing technology to realize the innovative home concept in the smart living era. In this report, the author will discuss the manufacture of smart lamps dedicated to the 315 laboratories as learning materials for the future. In designing this smart lamp, the author uses firebase by google as the network layer. Many researchers use other types of cloud bases, but this time the author tends to prefer firebase because of the advantages of the cloud system by Google.

Keywords: IoT; smart lamp; firebase; realtime database

1 Introduction

Along with modernization in Indonesia, electricity users often do not realize that electrical energy is still used from electronic devices left on and unused. As a result, a lot of electrical energy is wasted due to unwise use. Modernization requires creative automation. This significantly minimizes the amount of human labor needed to complete the job. Energy efficiency is critical due to environmental concerns and limited research on alternative renewable energy sources. When evaluating the impact of technology on the environment, energy is an essential factor to consider. Most big cities and provinces in Indonesia still use conventional lighting systems where electricity users manually turn on and off lights [1]. Current lighting systems combine compact fluorescent lamps (CFLs) with integrated high-pressure sodium lamps to

Smart Lamp Using Google Firebase as Realtime Database

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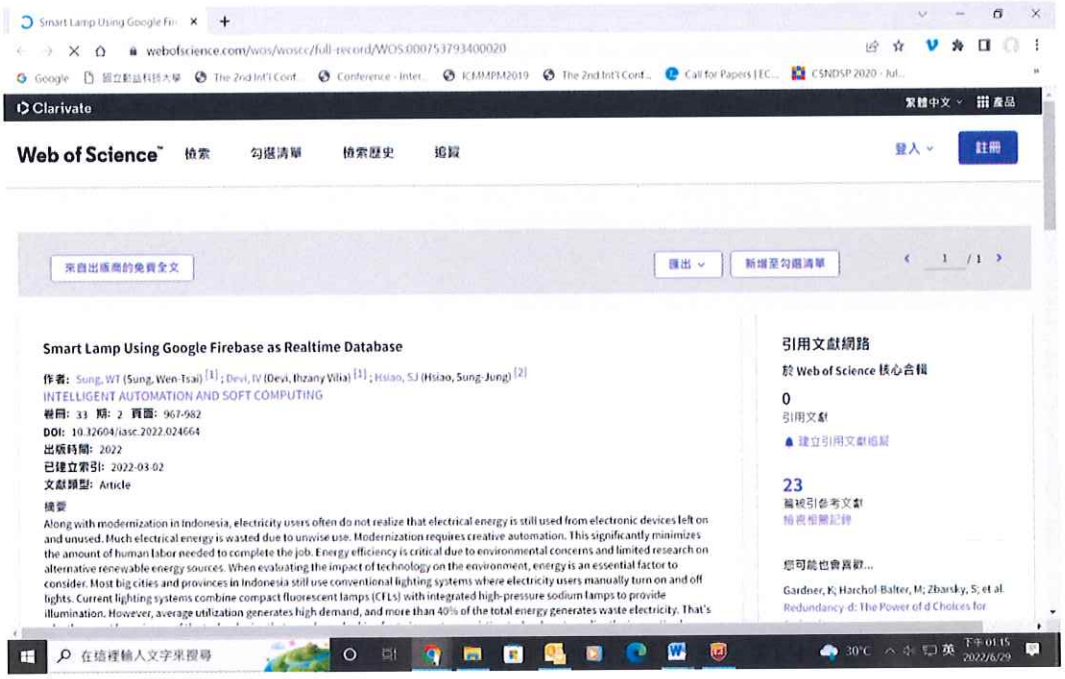

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RESEARCH ARTICLE

Blockchain-Based Supply Chain Information Sharing Mechanism

SUNG-JUNG HSIAO[1] AND WEN-TSAI SUNG[2], (Member, IEEE)
[1]Department of Information Technology, Takming University of Science and Technology, Neihu, Taipei City 11451, Taiwan
[2]Department of Electrical Engineering, National Chin-Yi University of Technology, Taiping, Taichung 411030, Taiwan

Corresponding author: Wen-Tsai Sung (songchen@ncut.edu.tw)

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ABSTRACT This paper proposes a blockchain-based supply chain information operation method to solve the current shortage of business information sharing in the supply chain. These approaches include the idea of blockchain application to realize the sharing of supply chain information, the supply chain architecture of production enterprises based on blockchain, and the hierarchical model of supply chain information flow based on blockchain. This paper proposes the information block recording method of internal and external data sources in the supply chain, including the composition structure and the analysis of the multisource data inside and outside the supply chain. In addition, the multisource data information block recording method is also proposed. Building a blockchain-based supply chain system can improve the integration and reconstruction capabilities of the supply chain. The information recording of the internal data of the supply chain and the external related multisource data in the block can improve the learnability of the supply chain. The internal and external information block connection of the supply chain system is the further integration and reconstruction of the supply chain information resources in the blockchain system. The information storage and access control of the blockchain-based supply chain is an information security guarantee system in the supply chain information sharing environment. Through the method of this study, the system can form a business architecture system based on blockchain-based supply chain information sharing.

INDEX TERMS Blockchain, mechanism, supply chain information sharing, security.

I. INTRODUCTION

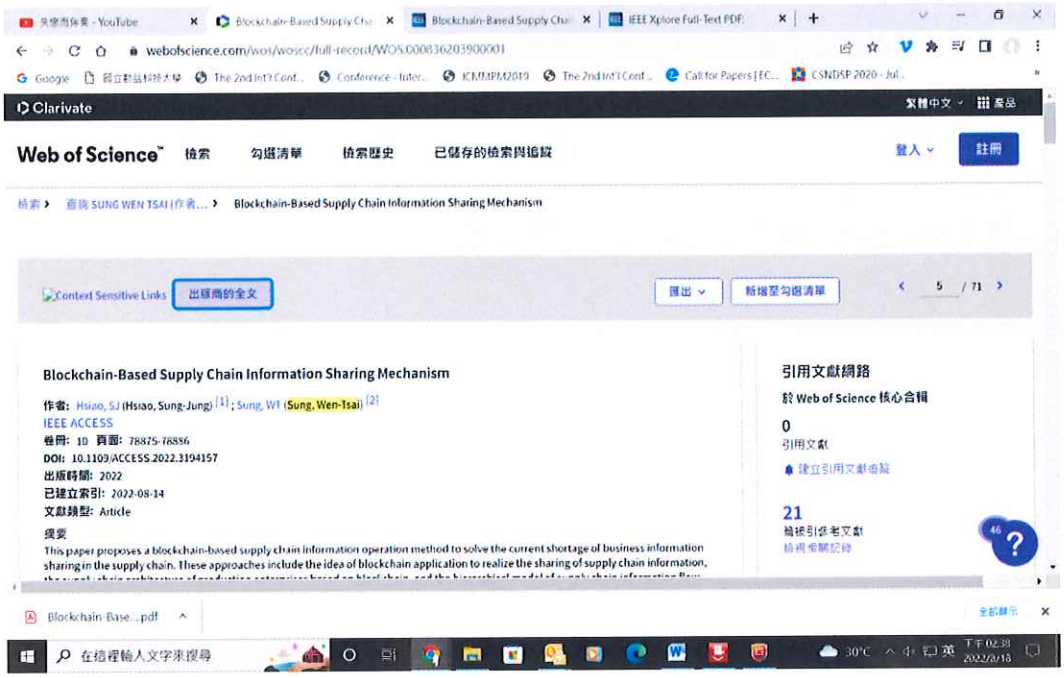
This paper studies the business system of supply chain information sharing based on blockchain. This study also proposes a blockchain-based supply chain information-sharing mechanism. Through the method of this study, the system can form a business architecture system based on blockchain-based supply chain information sharing. The system also establishes a management mechanism for supply chain information security issues. The proposed method reflects the impact mechanism of blockchain-based information sharing on the supply chain dynamic capabilities, system adaptability, information reliability, and system network effects. This paper clarifies the main influencing factors and the relationships between the cost investment and the benefit of constructing a blockchain-based supply chain information-sharing mechanism. This study uses blockchain to improve the mechanism of supply chain business competitiveness [1], [2].

The associate editor coordinating the review of this manuscript and approving it for publication was Mehdi Sookhak.

II. SUPPLY CHAIN BUSINESS INFORMATION SHARING STATUS ANALYSIS

When The sharing of supply chain information can promote the mutual supervision of business entities and promote the transparency of the supply capacity of the supply side and the specific needs of the demand side. Then, supply chain information is shared to achieve precise docking of supply and demand. Sharing the supply chain information can improve the "information island" status of independent business content information in the supply chain. For example, this ERP

Blockchain-Based Supply Chain Information Sharing Mechanism



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Article

Tech Science Press

6

Smart Garbage Bin Based on AIoT

Wen-Tsai Sung[1], Ihzany Vilia Devi[1], Sung-Jung Hsiao[2,*] and Fathria Nurul Fadillah[1]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao, Email: sungjung@gs.takming.edu.tw
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Abstract: Waste management and monitoring is a major concern in the context of the environment, and has a significant impact on human health. The concept of the Artificial Intelligence of Things (AIoT) can help people in everyday tasks in life. This study proposes a smart trash bin to help solve the problem of waste management and monitoring. Traditional methods of garbage disposal require human labor, and pose a hazard to the worker. The proposed smart garbage bin can move itself by using ultrasonic sensors and a web camera, which serves as its "eyes." Because the smart garbage bin is designed for indoor use and mobility, we use a Bluetooth beacon for location tracking, whereby the bin transmits a constant signal that the other devices in the environment can detect. A smart garbage bin was developed in this study to be used in the E315 research room in the Electrical Engineering Department of the National Chin-Yi University of Technology. An Android application was also developed to help users monitor waste in the smart bin.

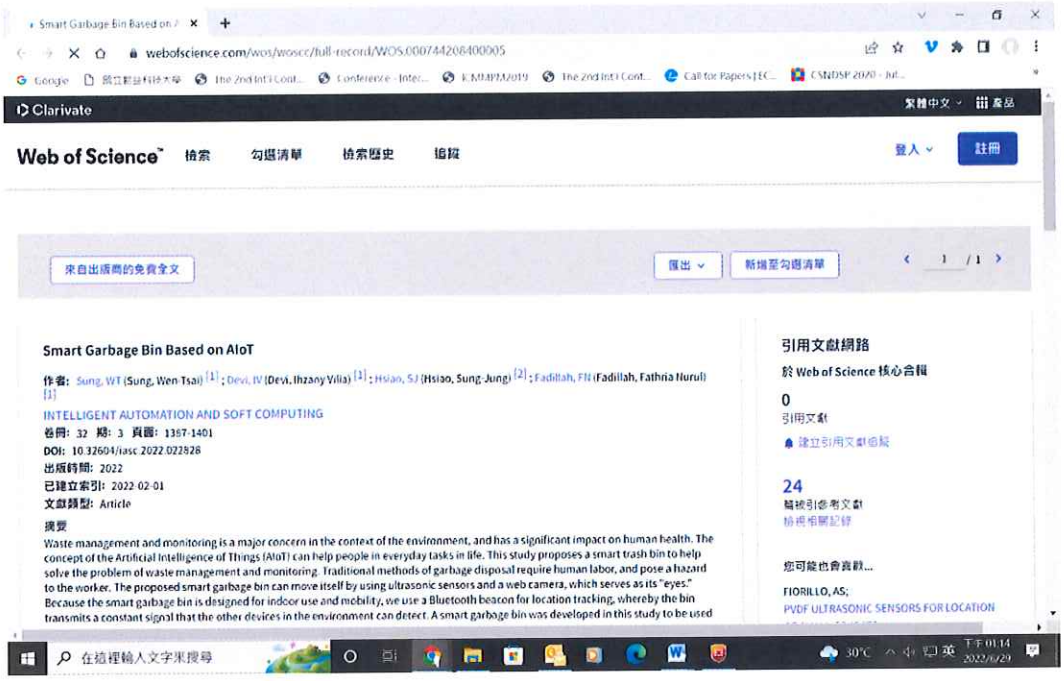
Keywords: AIoT; ultrasonic sensor; edge detection; indoor positioning system (IPS); Bluetooth low energy (BLE)

1 Introduction

Garbage collectors are used in a variety of settings, including businesses, offices, schools, hospitals, and streets [1]. Waste management plays a crucial role in creating a clean environment in cities across the globe [2]. In an enclosed environment, garbage becomes an obstacle and a health hazard for residents because it can affect air quality and cleanliness. The disposal of trash is the problem considered in this paper. The main challenge in the typical garbage collection procedure is inspecting dust containers without knowing the baseline information, which is the level of waste. This technique leads to fuel and time being wasted [3]. The timely collection of waste minimizes overflowing garbage and helps keep the indoor environment clean [4]. Because solid waste management is a crucial aspect of environmental hygiene, it must be incorporated into environmental planning to create a clean and comfortable living atmosphere.

According to the World Health Organization (WHO), sanitation services and workers are essential for operational support during the COVID-19 pandemic, but they also incur a high risk of contracting this and other diseases due to the nature of their work [5]. The garbage bin is a hotbed for germs, and people

Smart Garbage Bin Based on AIoT



Intelligent Automation & Soft Computing
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Article

Tech Science Press

Aquarium Monitoring System Based on Internet of Things

Wen-Tsai Sung[1], Shuo-Chen Tasi[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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Abstract: With the ever-increasing richness of social resources, the number of devices using the Internet of Things is also increasing. Currently, many people keep pets such as fish in their homes, and they need to be carefully taken care of. In particular, it is necessary to create a safe and comfortable environment for them and to maintain this environment continuously. An adverse environment can affect the growth of fish and may even result in their death. This study used the LinkIt 7697 module and the BlocklyDuino editor to produce a control system for a smart aquarium. The purpose of this system is to monitor the temperature, light intensity, and water level in an aquarium, as well as to provide alerts to presence of intruders; therefore, temperature, light, ultrasonic, and infrared sensing modules are used. The system has set aquarium environment thresholds, and it processes the signals obtained by the sensors to control and optimize the outputs to loads using data fusion calculations so that the aquarium has the most comfortable environment for the fish. An automatic feeder is also included in the system, and this uses a servo motor. The data from the system is uploaded to a back-end computer through the built-in Wi-Fi system of the LinkIt 7697 module. The Cloud Sandbox platform is used to display the results in real time, achieving the purpose of remote network monitoring.

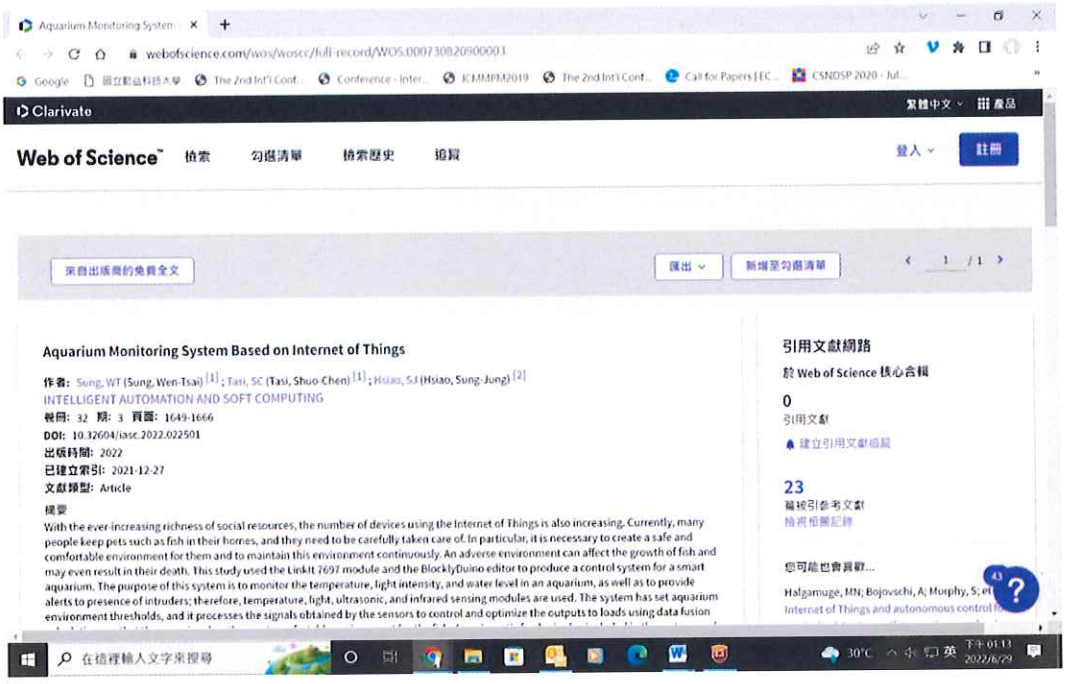
Keywords: Internet of things; linkIt 7697; cloud sandbox; Wi-Fi; blocklyDuino editor

1 Introduction

In modern society, many people keep pets to accompany them. However, in contrast to large pets such as cats and dogs, which need to spend time outdoors, pet fish only need to be fed each day and periodically have their water changed. Pet fish can provide decoration for a home and be psychologically comforting; watching them can help people to relax, and as a result many people now keep them. In a survey in the United States in 2020, it was found that of all pets, the proportion of people keeping pet fish was the largest, as shown in Fig. 1.

People usually spend a proportion of their time out of the home. During these periods, it is not generally possible to know whether their aquarium is experiencing an abnormal situation. In this study, Internet of

Aquarium Monitoring System Based on Internet of Things



applied sciences

MDPI

Article

Improving Particle Swarm Optimization Analysis Using Differential Models

Sung-Jung Hsiao [1] and Wen-Tsai Sung [2,*]

[1] Department of Information Technology, Takming University of Science and Technology, Taipei City 11451, Taiwan; sungjung@gs.takming.edu.tw
[2] Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung City 411030, Taiwan
* Correspondence: songchen@ncut.edu.tw

Abstract: This paper employs the approach of the differential model to effectively improve the analysis of particle swarm optimization. This research uses a unified model to analyze four typical particle swarm optimization (PSO) algorithms. On this basis, the proposed approach further starts from the conversion between the differential equation model and the difference equation model and proposes a differential evolution PSO model. The simulation results of high-dimensional numerical optimization problems show that the algorithm's performance can be greatly improved by increasing the step size parameter and using different transformation methods. This analytical method improves the performance of the PSO algorithm, and it is a feasible idea. This paper uses simple analysis to find that many algorithms are improved by using the difference model. Through simple analysis, this paper finds that many AI-related algorithms have been improved by using differential models. The PSO algorithm can be regarded as the social behavior of biological groups such as birds foraging and fish swimming. Therefore, these behaviors described above are an ongoing process and are more suitable for using differential models to improve the analysis of PSO. The simulation results of the experiment show that the differential evolution PSO algorithm based on the Runge–Kutta method can effectively avoid premature results and improve the computational efficiency of the algorithm. This research analyzes the influence of the differential model on the performance of PSO under different differenced conditions. Finally, the analytical results of the differential equation model of this paper also provide a new analytical solution.

Keywords: particle swarm optimization (PSO); differential equation; difference equation; stability

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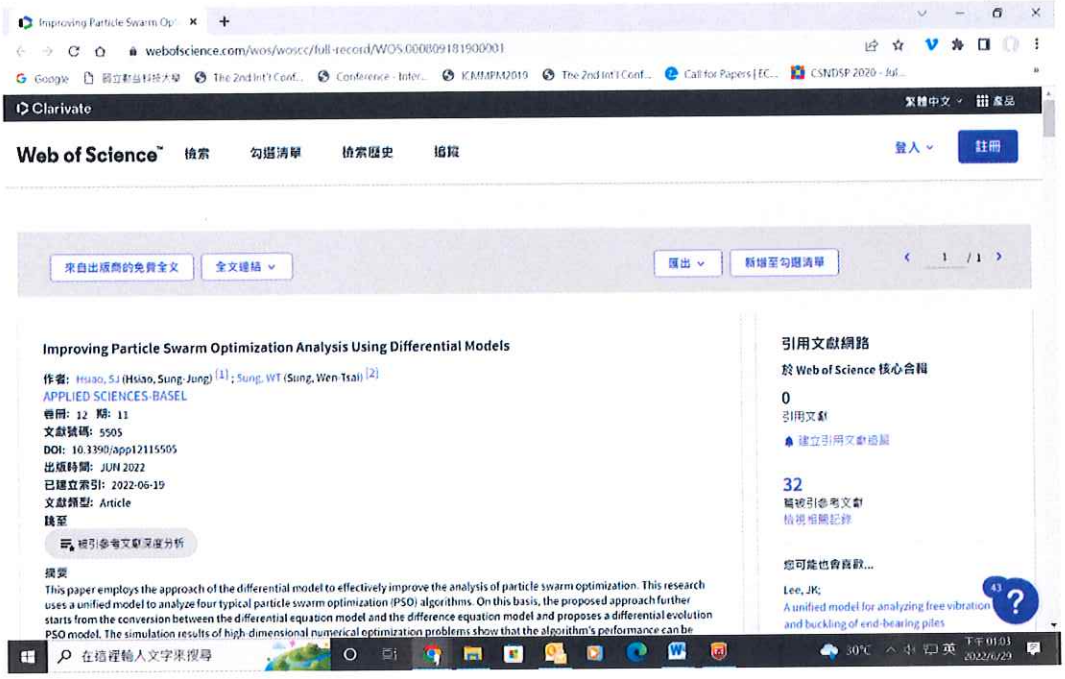
1. Introduction

Since the introduction of PSO, many scholars have improved its performance from different viewpoints. Scientists have proposed inertia weights, contraction factors, PSOs with time acceleration constants, and understanding learning and random PSOs from a mathematical point of view. Researchers have proposed PSO with escape behavior from the viewpoint of biology and also proposed PSO with Kalman filtering and a Bayesian network PSO from the viewpoint of information theory [1,2]. Many scholars have proposed quantum PSO from the field of physics. Therefore, researchers are faced with many improved algorithms and methods to analyze and utilize their advantages. The above process can also further improve the performance of the algorithm. However, processing and analyzing these algorithms will become a more difficult problem [3,4].

In 2006, Professor De Jong pointed out that the field of intelligent computing needs to establish a unified model to effectively analyze the various intelligent algorithms that have been proposed; this is a developing research field [5]. The establishment of a unified model of smart algorithms requires the effective integration of each algorithm itself, establishing a unified model for all smart algorithms. Because the PSO algorithm was proposed late, various theoretical systems have not yet been established, so it is urgent to establish such a

Improving Particle Swarm Optimization Analysis Using Differential Models



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Tech Science Press

9

RFID Positioning and Physiological Signals for Remote Medical Care

Wen-Tsai Sung[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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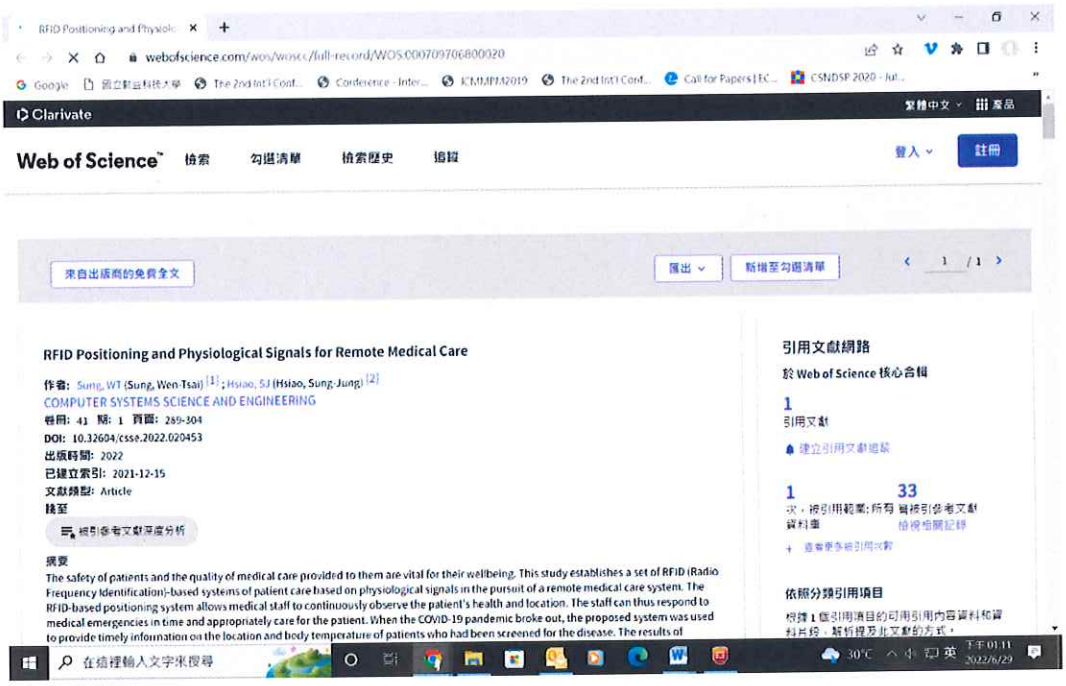
Abstract: The safety of patients and the quality of medical care provided to them are vital for their wellbeing. This study establishes a set of RFID (Radio Frequency Identification)-based systems of patient care based on physiological signals in the pursuit of a remote medical care system. The RFID-based positioning system allows medical staff to continuously observe the patient's health and location. The staff can thus respond to medical emergencies in time and appropriately care for the patient. When the COVID-19 pandemic broke out, the proposed system was used to provide timely information on the location and body temperature of patients who had been screened for the disease. The results of experiments and comparative analyses show that the proposed system is superior to competing systems in use. The use of remote monitoring technology makes user interface easier to provide high-quality medical services to remote areas with sparse populations, and enables better care of the elderly and patients with mobility issues. It can be found from the experiments of this research that the accuracy of the position sensor and the ability of package delivery are the best among the other related studies. The presentation of the graphical interface is also the most cordial among human-computer interaction and the operation is simple and clear.

Keywords: Remote medical care; active RFID; positioning; physiological signal

1 Introduction

The use of RFID allows medical staff to keep track of patients at any time. Patients in hospital often need to go to different clinics for various treatments. However, when they enter and exit these clinics, a management mechanism to record the patients' movements is often not available. The medical staffs usually need to call several clinics to determine the whereabouts of the patient in this case, which might cause them to miss a scheduled treatment or medication. The RFID positioning system proposed passive positioning calculation method in this study allows medical staff to quickly find the patient, and systematically manage and integrate their movements. The system is a service extended through RFID applications. It requires that RFID tags be attached to patients, trend cards in various clinics, and digital devices. When a patient is hospitalized, they wear a wristband with an RFID tag provided at the nursing station. Assuming that the patient requires ultrasound and X-ray examination, the nurse uses a handheld

RFID Positioning and Physiological Signals for Remote Medical Care



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https://doi.org/10.1186/s13638-022-02096-5

EURASIP Journal on Wireless Communications and Networking

RESEARCH Open Access

Early warning of impending flash flood based on AIoT

Wen-Tsai Sung[1], Ihzany Vilia Devi[1] and Sung-Jung Hsiao[2*]

*Correspondence:
sungjung@gs.takming.edu.tw
[2] Department of Information Technology, Takming University of Science and Technology, Taipei City 11451, Taiwan
Full list of author information is available at the end of the article

Abstract

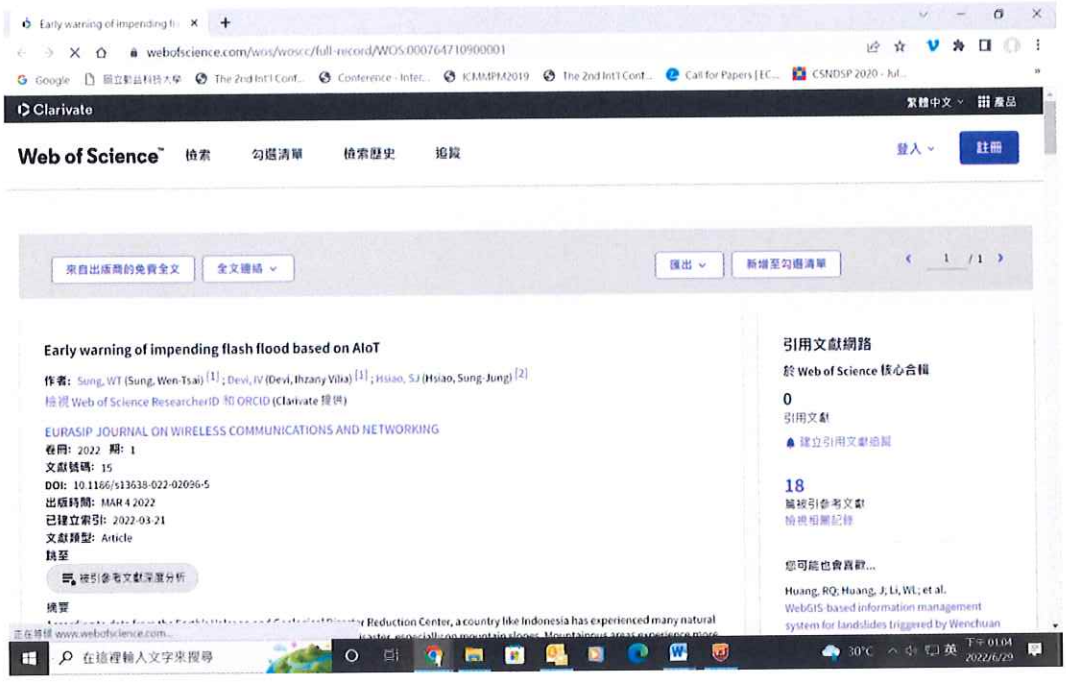
According to data from the Earth's Volcano and Geological Disaster Reduction Center, a country like Indonesia has experienced many natural disasters, one of which is flooding. Floods are an annual natural disaster, especially on mountain slopes. Mountainous areas experience more dangerous than floods than the urban areas because they can cause other natural disasters, such as landslides and damage the hiking trails. The steep and winding roads minimize and limit the number of officers working in the mountains. Therefore, flood detection and monitoring equipment is needed. The proposed system based on AIoT technology provides real-time flood analysis so that the authorities can monitor residents around mountainous areas and provide early warning. This research focuses on the flood observation system as an early warning system to effectively monitor the flood-prone mountain slopes in real time while taking into account the cost, time efficiency, and safety measurement. The proposed system design includes the integration of sensors into the microcontroller, and the communication between the posts using LoRa and SIM900 sends data to the cloud server via the Internet. All sensor readings for each post are displayed on the app, and alerts are sent via SMS and the app.

Keywords: AIoT, LoRa, Tilt sensor, Rain gauge sensor, Water flow sensor

1 Introduction

Due to the global greenhouse effect, the earth's climate is abnormal, so this phenomenon has caused continuous natural disasters around the world. In fact, many residents live in mountainous areas worldwide. Among the many natural disasters occurring on the earth, flood is one of them. Flooding is a natural disaster that often occurs on the earth; for instance, in Indonesia, it occurs not only in cities but also in mountainous areas. One of the factors affecting flooding is rainfall. The greater the rainfall, greater is the flood flow which the more serious the direct or indirect damage to the land [1]. According to Pannagos et al., the energy input of the earth's surface exposed to rainfall is one of the key factors in controlling water erosion [2]. People living on hillsides in mountainous areas include dense population, high poverty rates, highly dependent on climate-sensitive resources, lack of awareness of climate risks, unplanned urbanization and poor infrastructure, and experience many other disadvantages. Most farmers, fishermen, small business owners, and other communities living in low-lying

Early warning of impending flash flood based on AIoT



electronics

Article

Controller Design of Tracking WMR System Based on Deep Reinforcement Learning

Chin-Tan Lee [1] and Wen-Tsai Sung [2,*]

[1] Department of Electronic Engineering, National Quemoy University, Jinning 892009, Taiwan; ktlee@nqu.edu.tw
[2] Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung City 411030, Taiwan
* Correspondence: songchen@ncut.edu.tw; Tel.: +886-4-23924505 (ext. 7225)

Abstract: Traditional PID controllers are widely used in industrial applications due to their simple computational architecture. However, the gain parameters of this simple computing architecture are fixed, and in response to environmental changes, the PID parameters must be continuously adjusted until the system is optimized. This research proposes to use the most important deep reinforcement learning (DRL) algorithm in deep learning as the basis and to modulate the gain parameters of the PID controller with fuzzy control. The research has the ability and advantages of reinforcement learning and fuzzy control and constructs a tracking unmanned wheel system. The mobile robotic platform uses a normalization system during computation to reduce the effects of reading errors caused by the wheeled mobile robot (WMR) of environment and sensor processes. The DRL-Fuzzy-PID controller architecture proposed in this paper utilizes degree operation to avoid the data error of negative input in the absolute value judgment, thereby reducing the amount of calculation. In addition to improving the accuracy of fuzzy control, it also uses reinforcement learning to quickly respond and minimize steady-state error to achieve accurate calculation performance. The experimental results of this study show that in complex trajectory sites, the tracking stability of the system using DRL-fuzzy PID is improved by 15.2% compared with conventional PID control, the maximum overshoot is reduced by 35.6%, and the tracking time ratio is shortened by 6.78%. If reinforcement learning is added, the convergence time of the WMR system will be about 0.5 s, and the accuracy rate will reach 95%. This study combines the computation of deep reinforcement learning to enhance the experimentally superior performance of the WMR system. In the future, intelligent unmanned vehicles with automatic tracking functions can be developed, and the combination of IoT and cloud computing can enhance the innovation of this research.

Keywords: PID controller; fuzzy control; wheeled mobile robot; deep reinforcement learning; normalized system

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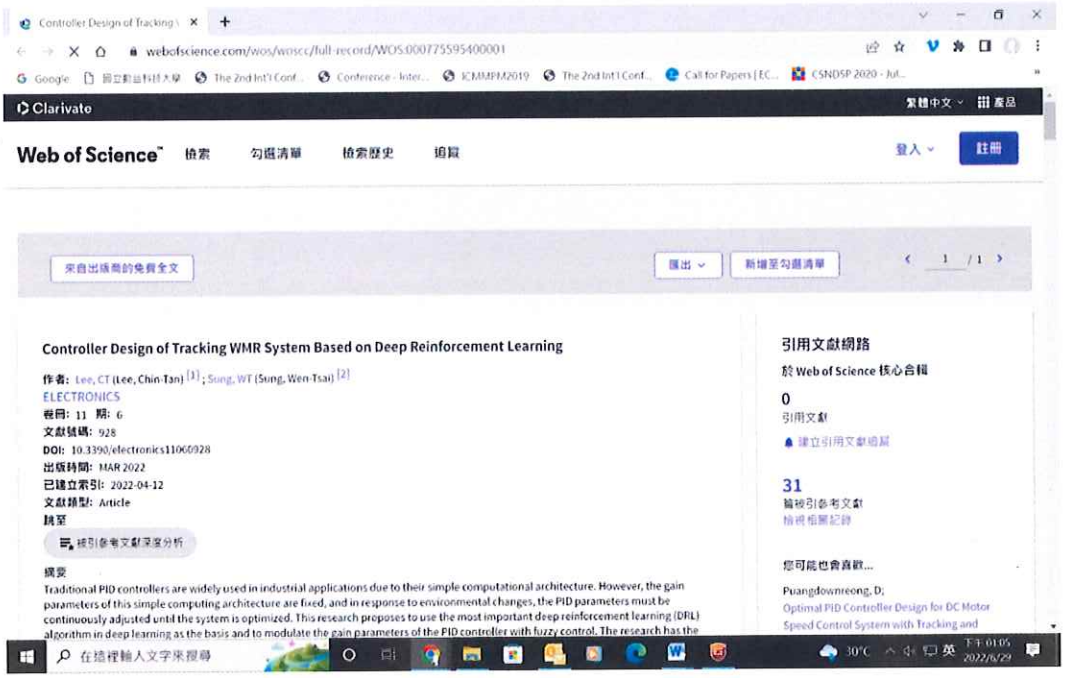
1. Introduction

In response to Industry 4.0, the application studies of the Internet of Things and intelligent robots have been popular subjects for industrial and academic development. The wheeled mobile robot (WMR) tracking system, which can be extensively used in path following and control of domestic robots [1], transport robots [2], unmanned vehicles [3], and navigation systems [4], has become one of the major research focuses of related technical fields. At present, common WMRs mostly use black adhesive tape, walls, or other media with feature recognition, to form the path planning of a tracking system [5], and uses infrared reflective [6], ultrasound [7], laser ranging, image recognition [8], or the feature medium recognition of gas detection to obtain the real-time position of WMR and to control tracking [9].

Controller Design of Tracking WMR System Based on Deep Reinforcement Learning



Computers, Materials & Continua
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Article

Tech Science Press

(12)

Utilizing the Improved QPSO Algorithm to Build a WSN Monitoring System

Wen-Tsai Sung[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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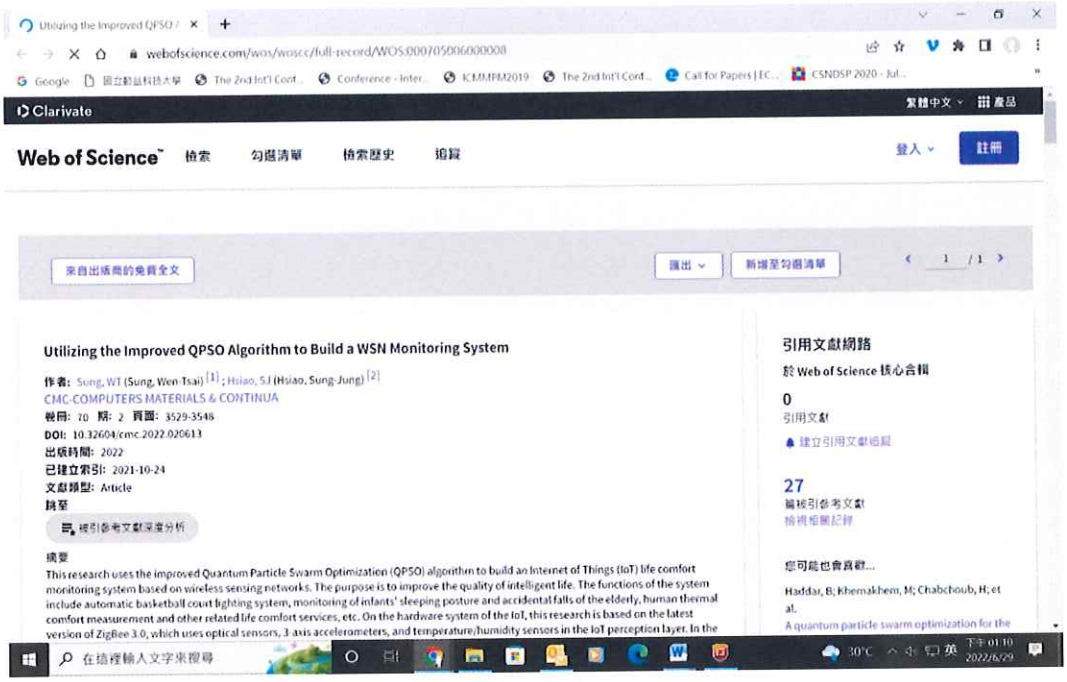
Abstract: This research uses the improved Quantum Particle Swarm Optimization (QPSO) algorithm to build an Internet of Things (IoT) life comfort monitoring system based on wireless sensing networks. The purpose is to improve the quality of intelligent life. The functions of the system include automatic basketball court lighting system, monitoring of infants' sleeping posture and accidental falls of the elderly, human thermal comfort measurement and other related life comfort services, etc. On the hardware system of the IoT, this research is based on the latest version of ZigBee 3.0, which uses optical sensors, 3-axis accelerometers, and temperature/humidity sensors in the IoT perception layer. In the network transmission layer, the central network architecture is used for connection. In the application layer, we have designed a graphical interface for real-time values and information that can be read at any time and place using mobile devices. In this study, authors use the improved QPSO algorithm in the calculation part, so that the target can be effectively positioned outside the numerous surveillance data. This study uses various sensor data fusion technologies to make the IoT system becomes able to provide more extensive and even better services than ever before. In short, this research work has proven to be an effective way to reduce power consumption, improve medical quality and provide higher comfort for intelligent lift level.

Keywords: Quantum particle swarm optimization; IoT; wireless sensor network; ZigBee

1 Introduction

The IoT is a network composed of global connected things, which is constantly expanding in scale. The connected things can transmit data and communicate with each other. These objects have unique identification codes and have a wide range of applications, covering fields such as mobile devices, household appliances and automobiles in one fell swoop. Traditionally, the connection capability mainly relied on Wi-Fi wireless networks, but now 5G and other types of network platforms have gradually been able to handle large data sets with the speed and reliability [1–3]. The ultimate goal of IoT devices collecting and transmitting data is to analyze

Utilizing the Improved QPSO Algorithm to Build a WSN Monitoring System



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Article

Tech Science Press

(13)

Employing a Fuzzy Approach for Monitoring Fish Pond Culture Environment

Wen-Tsai Sung[1] and Sung-Jung Hsiao[2,*]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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Abstract: This study builds an automatic monitoring system for the fish pond culture environment. The purpose of this study is to reduce culture costs, including those resulting from labor costs and natural disasters, and make it easier for culturists to manage their fish ponds. With the proposed system, physical indicators of water quality are extracted by temperature, dissolved oxygen, and pH sensing modules; the heater, submerged motor pump, air pump, feeding trough, and LED illuminating lamp are controlled to improve the water quality and reduce labor. The wireless sensor network (WSN) is used as the signal transmission architecture between the sensor nodes, the control nodes, and the computer, where the human–machine interface is used for display, recording, and operation. In order to make the system more efficient and accurate, the fuzzy theory is used for fuzzy inference of the sensed signal, which enables the controlled load to be optimized and combined with the WSN so that the real-time information of the fishponds can be made available to culturists through mobile devices or remote platforms. The grid and storage battery are used as an uninterruptible power supply (UPS) to alternately power the sensors. The experimental results show that the fish pond culture environment can be accurately and stably monitored. The proposed monitoring system is constructed using a network of sensors, and it achieves precise judgment and real-time control. Based on the current situation, the system instantly turns on the hardware device to change the environment as needed.

Keywords: Automatic monitoring system; fuzzy inference; wireless sensor network; fish pond culture

1 Introduction

In recent years, with the greenhouse effect influencing global weather and global ocean fish yields, offshore fishing has been gradually replaced by net cage culture and inland culture. Taking inland culture as an example, in traditional culture techniques, environmental change is artificially judged to adjust the start-stop timing of equipment. However, this increases labor costs, and the complicated switching of controlled devices affects the device's life and directly increases energy loss. Therefore, artificial culture has been gradually replaced by automatic culture techniques. The cost of culture can be discussed in two parts: staff costs and equipment costs. The staff cost problem is solved by automatic control techniques,

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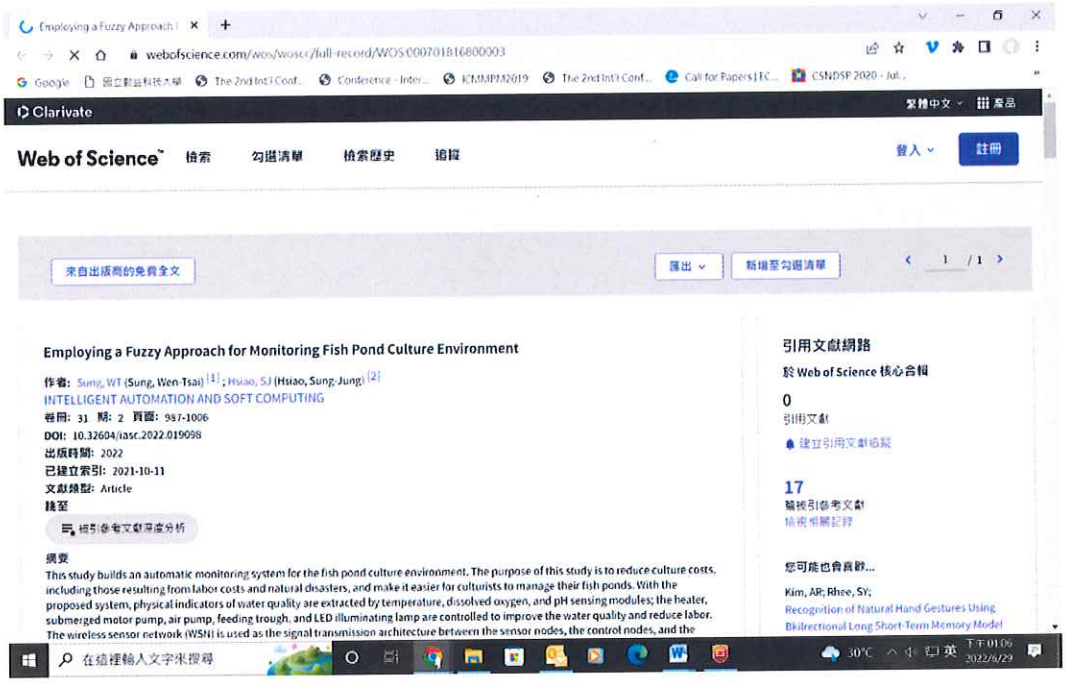
Employing a Fuzzy Approach for Monitoring Fish Pond Culture Environment



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Article

Tech Science Press

Constructing a Deep Image Analysis System Based on Self-Driving and AIoT

Wen-Tsai Sung[1], Sung-Jung Hsiao[2,*] and Chung-Yen Hsiao[1]

[1]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
[2]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
*Corresponding Author: Sung-Jung Hsiao. Email: sungjung@gs.takming.edu.tw
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Abstract: This research is based on the system architecture of Edge Computing in the AIoT (Artificial Intelligence & Internet of Things) field. In terms of receiving data, the authors proposed approach employed the camera module as the video source, the ultrasound module as the distance measurement source, and then compile C++ with Raspberry Pi 4B for image lane analysis, while Jetson Nano uses the YOLOv3 algorithm for image object detection. The analysis results of the two single-board computers are transmitted to Motoduino U1 in binary form via GPIO, which is used for data integration and load driving. The load drive has two parts: DC motor (rear wheel drive) and servo motor (front wheel steering). Then the final data of NodeMCU is wirelessly transmitted to the router, and then transmitted to the terminal smart device through the 4G network, thus completing the task of monitoring automatic driving. At present, artificial intelligence, the Internet of Things, and autonomous driving technologies are developing rapidly. The highlights of this research are three parts. The first part is the use of two image analysis methods to complete the automatic driving work, and the second part is the hardware architecture and circuit combination. The third part is that the system of this research is designed based on the Internet of Things architecture. The proposed system is to realize the data integration of various analysis platforms such as Raspberry Pi 4B, Jetson Nano, Motoduino U1, and mobile phone APP. The proposed method can not only realize the driving of an autonomous driving model car through image analysis but also monitor the autonomous driving process.

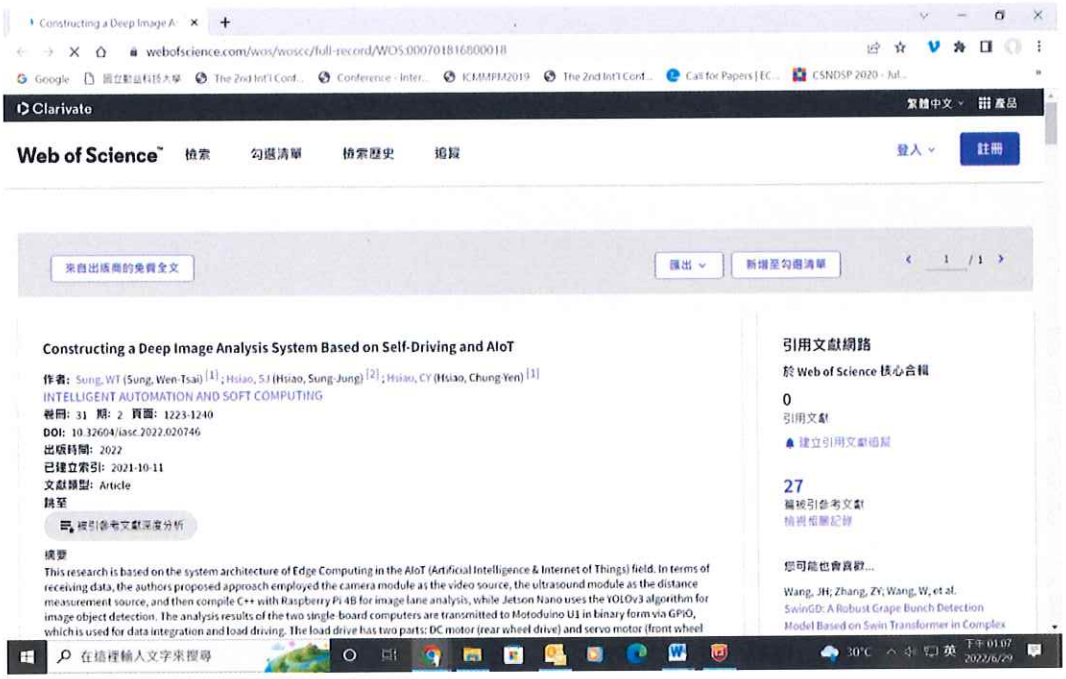
Keywords: AIoT; edge computing; single-board computer; image lane analysis; image object detection

1 Introduction

In recent years, artificial intelligence, Internet of Things, and Self-Driving Car technology have flourished. It can solve many problems that humans are facing, such as traffic safety, wasted commuting time, traffic flow, insufficient parking spaces. If self-driving cars are sold to consumers when the technology is immature, the entire society will be harmed, not just the driver. Therefore, this research still has a long way to go to achieve fully automated driving [1].

14

Constructing a Deep Image Analysis System Based on Self-Driving and AIoT



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Tech Science Press

Using Mobile Technology to Construct a Network Medical Health Care System

Sung-Jung Hsiao[1] and Wen-Tsai Sung[2,*]

[1]Department of Information Technology, Takming University of Science and Technology, Taipei City, 11451, Taiwan
[2]Department of Electrical Engineering, National Chin-Yi University of Technology, Taichung, 411030, Taiwan
*Corresponding Author: Wen-Tsai Sung. Email: songchen@ncut.edu.tw
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Abstract: In this study, a multisensory physiological measurement system was built with wireless transmission technology, using a DSPIC30F4011 as the master control center and equipped with physiological signal acquisition modules such as an electrocardiogram module, blood pressure module, blood oxygen concentration module, and respiratory rate module. The physiological data were transmitted wirelessly to Android-based mobile applications via the TCP/IP or Bluetooth serial ports of Wi-Fi. The Android applications displayed the acquired physiological signals in real time and performed a preliminary abnormity diagnosis based on the measured physiological data and built-in index diagnostic data provided by doctors, such as blood oxygen concentration, systolic pressure, and diastolic pressure. In addition, in this study, the R waves, which are the highest peaks of the PQRST waves in electrocardiograms, were analyzed and detected using the heart rate variability (HRV) for time-frequency analysis and calculation of the RR interval time series. In this study, the heart rate data in the same age group were collected, and the optimal value of the standard deviation of normal to normal (SDNN) during the time domain of a normal heartbeat was found using the particle swarm optimization (PSO) algorithm and set as the risk level of the SDNN time domain analysis. A spectral analysis on the activity of the autonomic nervous system (ANS) was performed and the preliminary analysis results were displayed on the Android handheld devices for comprehensive physiological data analysis and HRV time-frequency analysis. Healthcare needs are distributed at all levels, therefore user-friendly software interfaces have been written to meet the healthcare needs at all ages.

Keywords: Internet of things (IoT); particle swarm optimization (PSO); heart rate variability (HRV); android; wireless sensing network; sensor

1 Introduction

In recent years, technology has developed rapidly. The robotics promoted by artificial intelligence (AI) research and the development and Germany's Industry 4.0 driven by IoT have made technology gradually become the center of global economic growth. In such a highly competitive industrial situation, because enterprises are under pressures such as the demand for product innovation, the efficiency of solving

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