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Innovation And Technology Support Office,
Southern Leyte State University, 6606,
Sogod, Southern Leyte, Philippines

Application Type/No:	Invention 1/2020/050220	Filing Date:	30 June 2020 (30.06.2020)
Applicant:	Southern Leyte State University [PH]		
Title:	A DETECTION SYSTEM FOR PRESENCE OF FORMALIN IN FISH		
Division:	Inventions (ICED)	Examiner:	Randy T. Edroso

FORMALITY EXAMINATION REPORT

Applicant's request for grant of Philippine Patent dated 30 June 2020 is hereby acknowledged and marked as Paper No. 1. Online submission of descriptions, abstract, claims, drawings is acknowledged and entered on record.

Applicant's payment of Php 2,949.20 for filling fee, publication fee and legal research fund made on 17 July 2020 is also acknowledged.

This application has been formally examined. The following are the finding/s of the examiner made in view of R.A. 8293 (IP Code) and its Revised Implementing Rules and Regulations (IRR).

BASIS OF THE REPORT

The report has been established on the basis of:

Request Form:	Page(s) 1	as originally filed
Description:	Pages 1 – 15	as originally filed
Abstract	No. of page(s) 1	as originally filed
Claims:	Nos 1 – 5	as originally filed
Drawings:	Figure Nos 1 – 10	as originally filed

FINDINGS

The present application appears to have complied with all the formality requirements provided for therein.

In view thereof, the present application is declared COMPLETE as to form.

142713 Document No: 2020/35418

The applicant is informed that a search report together with a written opinion is attached hereto.

The search report contains relevant document(s) that reflect the prior art before the effective filing date of this application. The written opinion provides a preliminary and non-binding opinion on whether the invention appears to meet the patentability criteria in light of the search report results. This aims to help the applicant understand and interpret the results of the search report, being of special help in evaluating the chances of obtaining a patent.

REMINDERS

- *This application will be published after 18 months from the filing date.*
- *Applicant's response may be filed before the said publication.*
- *To facilitate early processing of the application, the applicant is invited to file a response within two (2) months from the mailing date of this communication.*
- *In amending the application, the said amendment shall not include new matter outside the scope of the disclosure contained in the originally filed application under Section 29 of the RA 8293, as amended and Rule 917 of the Revised IRR.*
- *All responses or communications must be addressed only to: THE DIRECTOR OF PATENTS, Intellectual Property Office of the Philippines, 14th Flr., Intellectual Property Center, 28 Upper McKinley Rd., McKinley Hill Town Center, Fort Bonifacio, Taguig City, 1634 Philippines. Applicant(s)name, Application number, Filing date, Title, Division and Name of Examiner-in-Charge should also be indicated. Applicant(s)name, Application number, Filing date, Title, Division and Name of Examiner-in-Charge should also be indicated.*
- *Applicant's response and corresponding payments may be conveniently filed electronically through the facility available under the eServices in the IPOPHL website or through this link:* **http://onlineservices.ipophil.gov.ph/eDocFilePatents/eDocFilePatents.aspx**. *All responses & communications, as well as other payments not covered in the eDoc system may still be received or filed manually at IPOPHL's Receiving Section.*
- *Any inquiry concerning this communication or earlier communications from the examiner should be directed to* ***Randy T. Edroso*** *whose office number is (02)-2386300 local 3714. The examiner can normally be reached on Monday to Friday, 9:00 am to 4:00 pm by phone or in person in the above stated address. If attempts to reach the examiner are unsuccessful, the examiner's supervisor* ***Rico E. Collado*** *can be reached on the same office number and addres.*

Response to this Office Action and corresponding payments must be filed/made electronically through the eDocFile Patents under eServices in the IPOPHL website or through this link: **http://onlineservices.ipophil.gov.ph/eDocFilePatents/eDocFilePatents.aspx**

Advance electronic copy of this communication could be sent via eCorrespondence (eCorr). To ensure that succeeding communications will be received electronically, please file a request for inclusion of in-service email address through edocfile Patents. If you are already receiving communication through eCorr, kindly check/verify the email address indicated in the header, if you wish to change it, you may also request for update of the in-service email address through edocfile Patents.

RICO E. COLLADO
IPRS IV, ICED

Intellectual Property Office of the Philippines
Bureau of Patents

SEARCH REPORT

IPAS FORM:	IPOPHL-BOP-INV-SR-02	ED:	21.03.2019	AP:	6

APPLICATION NO.:	1/2020/050220		
FILING DATE:	30 June 2020 (30.06.2020)	**EARLIEST PRIORITY DATE:**	None
TITLE:	A DETECTION SYSTEM FOR PRESENCE OF FORMALIN IN FISH		
DIVISION:	Inventions (ICED)		

IPC(S):	G06F 9/06 (2006.01); G06F 9/30 (2018.01); G06T 1/40 (2006.01)

DATABASE(S) CONSULTED:	IPAS 3.1.1d; ESPACENET; PATENTLENS; GOOGLE PATENTS; PATENTSCOPE; IEEEXPLORE; IPOPHL IPDL; USPTO IPDL

KEYWORD(S) USED:	FISH, EYE, IMAGE, IMAGE PROCESSING, DEEP LEARNING, MACHINE LEARNING, CNN, CONVOLUTIONAL NEURAL NETWORK, FORMALIN, DETECT*, CLASS*, CLASSIF*, PRESEN*

DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim no.
X	Fadhil Muhammad Hadini, "Detection System Milkfish Formalin Android-Based Method Based on Image Eye Using Naïve Bayes Classifier", MATICS: Jurnal Ilmu Komputer dan Teknologi Informasi Volume 9, No. 1 (2017), pp 33-40, ISSN: 1978-161X(p); 2477-2550(e), published online on 20 March 2017 (20.03.2017) <URL: http://ejournal.uin-malang.ac.id/index.php/saintek/article/view/4054> <DOI: 10.18860/mat.v9i1.4054> Whole document	1 – 3
Y	Guang Chen et al., "Automatic Fish Classification System Using Deep Learning", 2017 IEEE 29th International Conference on Tools with Artificial Intelligence (ICTAI), Electronic ISBN: 978-1-5386-3876-7, published online on 7 June 2018 (07.06.2018) <URL: https://ieeexplore.ieee.org/document/8371919> <DOI: 10.1109/ICTAI.2017.00016> Whole document	4 – 5
A	CN 107423571 B (Shenzhen Silicon-based Bionic Technology Co., Ltd. 06 July 2018 (06.07.20198 Whole document	1 – 5

*	Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance;the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance;the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	"R"	documents with restricted access

PRIMARY EXAMINER:	**RANDY T. EDROSO**	**SECONDARY EXAMINER(S):**	
DATE OF COMPLETION:	**28 NOVEMBER 2020 (28.11.2020)**		

Intellectual Property Office of the Philippines
Bureau of Patents

WRITTEN OPINION

IPAS FORM:	IPOPHL-BOP-INV-WO-02	ED:	21.03.2019	AP:	4

APPLICATION NO.	1/2020/050220		
FILING DATE:	30 June 2020 (30.06.2020)	EARLIEST PRIORITY DATE:	None
TITLE:	A DETECTION SYSTEM FOR PRESENCE OF FORMALIN IN FISH		
DIVISION:	Inventions (ICED)		

* This document provides a preliminary and non-binding opinion on whether the invention appears to meet the patentability criteria in light of the search report results. It aims to help the applicant understand and interpret the results of the search report, being of special help in evaluating the possibility of obtaining a patent.

CONSIDERED RELEVANT DOCUMENTS

Document	Publication Number/Publication Title; Inventor/Applicant/Author	Publication Date (Date Month Year)
D1	Fadhil Muhammad Hadini, "Detection System Milkfish Formalin Android-Based Method Based on Image Eye Using Naïve Bayes Classifier"	20 March 2017 (20.03.2017)
D2	Guang Chen et al., "Automatic Fish Classification System Using Deep Learning"	07 June 2018 (07.06.2018)

SUMMARY STATEMENTS

NOVELTY	Claim Nos.: 4 & 5 Claim No.: 1 – 3	Yes No
INVENTIVE STEP	Claim Nos.: None Claim No.: 1 – 5	Yes No
INDUSTRIAL APPLICABILITY	Claim Nos.: 1 – 5 Claim No.: None	Yes No

1. NOVELTY

1.1 Claims 1 – 3 as drafted appears to be not novel in view of D1.

1.1.1 As per independent claim 1, D1 discloses an image-based detection system for formalin in fish (Title: **Detection System Milkfish Formalin Android-Based Method on Image Eye Using Naïve Bayes Classifier**) comprising:

a) a mobile image-capture device for data entry (page 45, Item III: **Data collection instruments used in the study specifically designed to adjust the camera's ability to be used to take the image of a fish eye**);

b) a computer software component for data processing and analysis (pages 46- 47, column 1: **system implementation and analysis of systems work**);

c) a computer hardware component for housing said software component (Title: **Android-Based**); and

d) a database component for storing geo points, time, date and status of the captured and classified images (page 45, Item III: **A. Framework System, Figure 1: Design System (i.e. Database)**).

1.1.2 As per dependent claim 2, D1 discloses where said software component in (b) comprise of trainable image-based detection algorithm that can be taught to relate digital image information of fish eyes to a specific classification in said database (Abstract: **methods used in naïve bayes classifier as a detector with the object input in the form of fish eye image….parameter estimation have been built to detect fish formalin or not formalin.**).

1.1.3 As per dependent claim 3, D1 discloses where said software component in (b) performs a deep learning approach that relates the digital fish eye image to the presence or absence of formalin by classifying the extracted features of said images to classes using information from said database (Abstract: **methods used in naïve bayes classifier as a detector with the object input in the form of fish eye image....parameter estimation have been built to detect fish formalin or not formalin.**)..

1.2 Therefore, claims 1 – 3 as drafted appear to not meet the requirements of Section 23 of the IP Code (or Rule 203 of the Revised IRR on Inventions) with regard to novelty.

1.3 Claims 4 & 5 as drafted appears to be novel in view of D1.

1.3.1 As per dependent claim 4, D1 fails to disclose where said database in (d) could be in a cloud server or a backup server or both.

1.3.2 As per independent claim 5, D1 discloses an image-based detection process for formalin in fish comprising the following steps:

a) capturing digital images of fish eyes by image-capture device page 45, Item III: **Data collection instruments used in the study specifically designed to adjust the camera's ability to be used to take the image of a fish eye**;
b) introducing said digital image to image processing software; (c) configuring said digital image into desired dimension; (d) subjecting said digital image to preprocessing technique (Abstract: **methods used in naïve bayes classifier as a detector with the object input in the form of fish eye image....parameter estimation have been built to detect fish formalin or not formalin.**);

1.3.3 However, as per independent claim 5, D1 fails to disclose the use of Convolutional Neural Network (CNN); and

c) obtaining required parameters from said images by training the network using sets of convolutional (Conv2D)-pooling (Maxpooling2D) layers;
d) representing extracted features into a one-dimensional array; and
e) predicting the class of said features according using a final classifier that receives fish eye image information from the CNN.

1.4 Therefore, claims 4 & 5 as drafted appear to meet the requirements of Section 23 of the IP Code (or Rule 203 of the Revised IRR on Inventions) with regard to novelty.

2. INVENTIVE STEP

2.1 Since claims 1 – 3 as drafted appear to be not novel, it is apparent that the said claims also do not appear to meet the requirements of Section 26 of the IP Code with regard to inventive step.

2.2 Claims 4 & 5 as drafted appear to lack inventive step over D1 in view of D2.

2.2.1 Claims 4 & 5 differ from the cited reference D1 as stated in item nos. 1.3.1 & 1.3.3. However, D2 teaches a deep neural fish classification system to automatically label fish using a camera without interference from human. The query images taken in different work environments can be sent to a remote server. Then the remote server launches the proposed system to localize and classify the fish in the images (Fig.1), and then all the results are stored on hard disks. (**Page 24, Column 1**). Although, D2 does not explicitly teach that the use of Convolutional Neural Network is for detecting formalin in fish, it obvious to a person skilled in the art to incorporate Convolutional Neural Network (CNN) for classifying fish of D2, in android-based application that can identify fish with formalin of D1, since deep learning algorithms such as CNN is widely used to build classifiers and it can provide an accurate results than Naïve Bayes Classifier of D1. Hence, it is a mere workshop improvement or several known alternatives in the art to used CNN in an image-based process of detecting formalin in fish.

2.3 Therefore, claims 1 – 5 as drafted appear to not meet the requirements of Section 26 of the IP Code with regard to inventive step.

3. INDUSTRIAL APPLICABILITY

3.1 Claims 1 – 5 appear to meet the requirements of Section 27 of the IP Code with regard to industrial applicability because it can be made or used in industry.

ADDITIONAL COMMENTS

In view of the findings presented in this opinion, the Applicant is invited to amend the claims. Said amended claims should be submitted before the technical preparation of this application for publication (i.e. approximately 16 months from the filing date of this application). Otherwise, Applicant may submit the said amended claims together with the request for substantive examination.

In amending said claims, applicant is advised to obtain practical ideas in the preparation thereof by perusal or study on patents of the same subject matter in the IPO Digital Library (http://www.ipophil.gov.ph > SERVICES > e-Services > Patent Search) or in any other foreign patent office website.

EXAMINER:	**RANDY T. EDROSO**

DATE OF COMPLETION:	**28 NOVEMBER 2020 (28.11.2020)**

IMPORTANT REMINDER

In view of the findings of the Early Search Report and Written Opinion as attached, the applicant is highly encouraged to proceed his/her patent application to ***Patent Cooperation Treaty (PCT)*** *within 12 months from the filing date of this application. The PCT is an international treaty with more than 152 Contracting States, and for which the Philippines is a member and IPOPHL serves as a Receiving Office and a designated International Searching and Preliminary Examining Authority (ISA/IPEA).*

Patent Cooperation Treaty (PCT) allows nationals and residents in a PCT contracting state to seek patent protection for an invention or utility model (depending if the contracting state has utility model option) simultaneously in any of the PCT contracting states by filing a single "international" patent application instead of filing several separate national or regional patent applications. The applicant has up to 30 months from the earliest filing date of the application to pursue the grant of patents directly before the national or regional patent offices of the countries where the applicant want to seek protection.

It is noted, however, that the granting of patents remains under the control of the national or regional patent Offices during the national phase of corresponding applications.

To learn more about the benefits, eligibility, procedure, and fees of Patent Cooperation Treaty (PCT) filing system just log on at https://www.ipophil.gov.ph/patent-cooperation-treaty-international-application/ .

A fee waiver program has been provided for first 100 applicants who choose IPOPHL as the ISA/IPEA.

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SEARCH REPORT

INFORMATION ON PATENT FAMILY ANNEX

IPAS FORM:	IPOPHL-BOP-INV-FM-02	ED:	21.03.2019	AP:	1

APPLICATION NO.:	1/2020/050220

Patent document cited in search report	Publication Date	Patent family member(s)	Publication Date
NONE		NONE	
NONE		NONE	
CN 107423571 B	06.07.2018	CN 107423571 A CN 108172291 B CN 108553079 B CN 111481166 A CN 111493814 A US 20200160521 A1 WO 2018201633 A1	01.12.2017 07.01.2020 02.06.2020 04.08.2020 07.08.2020 21.05.2020 08.11.2018

PRIMARY EXAMINER:	Randy T. Edroso	DATE OF COMPLETION:	28 NOVEMBER 2020 (28.11.2020)