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LAMPIRAN

Lampiran 1 : Source Code

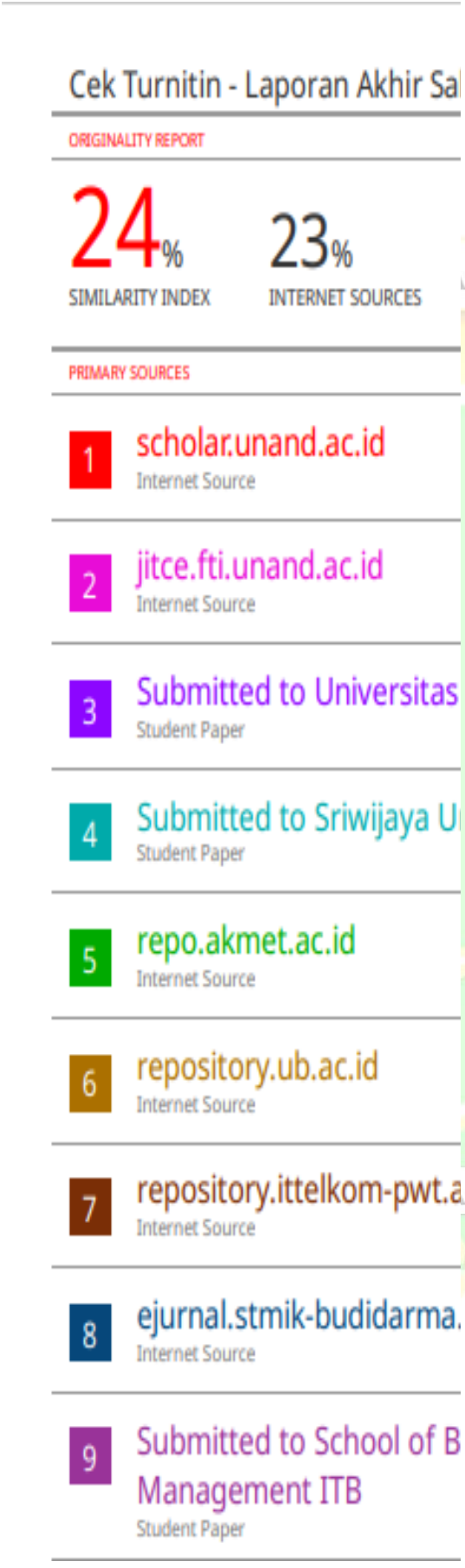
```
from dotenv import
dotenv_values

# imports telegram bot
from telegram import Bot
from telegram import
Update, ReplyKeyboardMarkup
from telegram.ext import
Updater, CommandHandler,
MessageHandler, Filters,
CallbackContext
from telegram import
InputFile

import tensorflow as tf
import cv2
import numpy as np
from time import sleep,
time
import RPi.GPIO as GPIO
from tcs3200 import TCS3200
from threading import
Thread

config =
dotenv_values(".env")

TELEGRAM_TOKEN =
config["TELEGRAM_TOKEN"]

updater =
Updater(token=TELEGRAM_TOKE
N, use_context=True)
dispatcher =
updater.dispatcher
user_states = {}

# load model
with open ('model.json',
'r') as json_file:
    json_saved_Model =
json_file.read()

# initialize model
model_j =
tf.keras.models.model_from_
json(json_saved_Model)
model_j.load_weights('model
.h5')


model_j.compile(

loss='sparse_categorical_cr
ossentropy',
    optimizer='adam',
    metrics=['accuracy']
)

# GPIO pins definition
BUTTON_PIN = 18
RELAY_PIN = 14

LED_RED_PIN = 13
LED_GREEN_PIN = 19
BUZZER_PIN = 6


# setup GPIOs
GPIO.setwarnings(False) #
ignore warnings
GPIO.setmode(GPIO.BCM) #
set GPIO mode to BCM

GPIO.setup(BUTTON_PIN,
GPIO.IN,
pull_up_down=GPIO.PUD_UP)
GPIO.setup(LED_GREEN_PIN,GP
IO.OUT)
GPIO.setup(LED_RED_PIN,GPIO
.OUT)
GPIO.setup(BUZZER_PIN,GPIO.
OUT)
GPIO.setup(RELAY_PIN,
GPIO.OUT)

color_sensor =
TCS3200(oe_pin = 8, s2_pin
= 23, s3_pin = 24,
signal_pin = 25)

def start(update:Update,
context: CallbackContext) -
> None:
    keyboard = [
        ["Rekap klasifikasi
data"]
    ]
```

```
    reply_markup =
ReplyKeyboardMarkup(keyboar
d, one_time_keyboard=True)


update.message.reply_text(
        "Hello! Pilihlah
opsi dibawah ini untuk
melihat klasfikasi data",

reply_markup=reply_markup
    )


def
rekap_klasifikasi_data(upda
te, context:
CallbackContext) -> None:
    chat_id =
update.message.chat_id
    file_path =
'classification_output.txt'

    with open(file_path,
'rb') as file:

context.bot.send_document(c
hat_id=chat_id,
document=file)


user_states[update.message.
from_user.id] = None

def
handle_user_input(update:
Update, context:
CallbackContext) -> None:
    user_id =
update.message.from_user.id
    user_input =
update.message.text

    if user_input ==
"/start":

user_states[user_id] = None
        start(update,
context)
    else:

user_states[user_id] =
user_input
```

```
start_handler =
CommandHandler('start',
start)
send_file_handler =
MessageHandler(Filters.text
("Rekap klasifikasi data"),
rekap_klasifikasi_data)
user_input_handler=
MessageHandler(Filters.text
& ~Filters.command,
handle_user_input)

dispatcher.add_handler(star
t_handler)
dispatcher.add_handler(send
_file_handler)
dispatcher.add_handler(user
_input_handler)

def grab_image(post_delay =
2):
    print("[INFO]\t--
Opening camera..")
    cap =
cv2.VideoCapture(0)
    print("[INFO]\t--
Capturing single frame..")
    ret, frame = cap.read()

    sleep(1)

    print("[INFO]\t--
Releasing camera..")
    cap.release()

    print(f"[INFO]\t--Post
Delaying.. ({time()})")
    sleep(post_delay)
    print(f"[INFO]\t--Done
({time()})")

    return frame

def in_range(val, val_from,
val_to):
    return (val >=
val_from) and (val <=
val_to)

def beep_buzzer():
```

```
    print("[INFO]\tBeeping
buzzer..")
    GPIO.output(BUZZER_PIN,
GPIO.HIGH)
    sleep(0.5)
    GPIO.output(BUZZER_PIN,
GPIO.LOW)

def turn_lamp_on():
    print("[INFO]\tLamp
on")
    GPIO.output(RELAY_PIN,
GPIO.HIGH)

def turn_lamp_off():
    print("[INFO]\tLamp
off")
    GPIO.output(RELAY_PIN,
GPIO.LOW)

def
is_egg_fertil(egg_count,
save_image = True):
    # grab image
    turn_lamp_on()
    img = grab_image()
    turn_lamp_off()

    if save_image:

print("[INFO]\tImage has
been saved")

cv2.imwrite(f"images/captur
ed_image_{egg_count}.jpg",
img)

    # pre-process image
    IMG_SIZE = 224
    rgb_img =
cv2.cvtColor(img,
cv2.COLOR_BGR2RGB)
    rgb_img =
cv2.resize(rgb_img,
(IMG_SIZE,IMG_SIZE))
    rgb_img =
np.resize(rgb_img,[1,IMG_SI
ZE,IMG_SIZE,3])

    # predict fertility
    predict_x =
model_j.predict(rgb_img)
    classes_x =
np.argmax(predict_x,axis=1)

    is_fertil = (classes_x
== 0)

    return is_fertil

def main_task():
    print("[INFO]\t Main
Task Started.")

    # load egg count from
previous reading
    with
open("output_count.txt",
"r") as count_file:
        egg_count =
int(count_file.read().strip
())

    while True:

        # read current
button state
        button_state =
GPIO.input(BUTTON_PIN)

        if button_state ==
True: continue

        # button pressed
        print("[INFO]\t
Button pressed.")

        is_fertil =
is_egg_fertil(egg_count)

        if is_fertil:

print("[INFO]\tTelur
fertil")
            beep_buzzer()

GPIO.output(LED_RED_PIN,
GPIO.LOW)

GPIO.output(LED_GREEN_PIN,
GPIO.HIGH)
        else:

print("[INFO]\tTelur
infertil")
```

```
GPIO.output(LED_RED_PIN,
GPIO.HIGH)

GPIO.output(LED_GREEN_PIN,
GPIO.LOW)

        # classifiying egg
type
        max_retry = 5
        for i in
range(max_retry):
            r, g, b =
color_sensor.get_rgb()

            egg_type =
"UNKNOWN"
            if in_range(r,
13000, 15000) and
in_range(g, 23629, 25055)
and in_range(b, 21119,
25085):

print("[INFO]\tTelur ayam
ras")
                egg_type =
"Telur ayam ras"
            elif
in_range(r, 19039, 20733)
and in_range(g, 20570,
29725) and in_range(b,
25637, 28591):

print("[INFO]\tTelur ayam
kampung")
                egg_type =
"Telur ayam kampung"
            elif
in_range(r, 17000, 29167)
and in_range(g, 25221,
27758) and in_range(b,
23224, 28513):

print("[INFO]\tTelur
bebek")
                egg_type =
"Telur bebek"
            else:

print("[INFO]\tTelur tidak
dikenali")
            if egg_type !=
"UNKNOWN":
                break


print(f"[INFO]\tRetrying
({i + 1})..")
            egg_count += 1
            with
open("output_count.txt",
"w") as count_file:

count_file.write(str(egg_co
unt))

            output_text =
f"Classification
{egg_count} Result:
{egg_type}, {'FERTIL' if
is_fertil else 'INFERTIL'}
\n"
            with
open(f"classification_outpu
t.txt", "a") as
output_file:

output_file.write(output_te
xt)


thread =
Thread(target=main_task)
thread.start()

updater.start_polling()
updater.idle()
```



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24% SIMILARITY INDEX

23% INTERNET SOURCES

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2 jitce.fti.unand.ac.id
Internet Source

3 Submitted to Universitas
Student Paper

4 Submitted to Sriwijaya U
Student Paper

5 repo.akmet.ac.id
Internet Source

6 repository.ub.ac.id
Internet Source

7 repository.ittelkom-pwt.a
Internet Source

8 ejurnal.stmik-budidarma.
Internet Source

9 Submitted to School of B Management ITB
Student Paper