



DEVELOPMENT OF IOT-BASED SOLUTION FOR CHECKING STUDENT ATTENDANCE

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Supervise: PhD. Pham Hoang Anh



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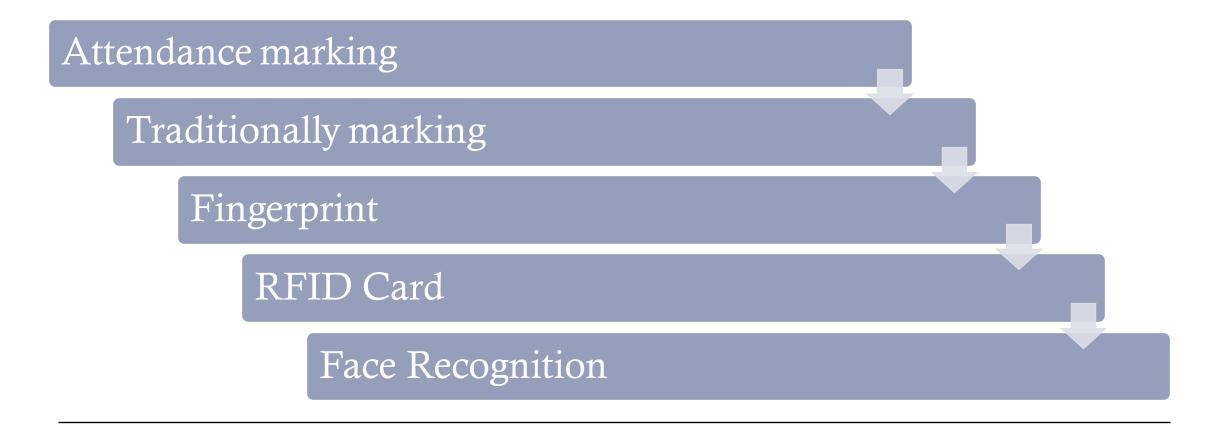






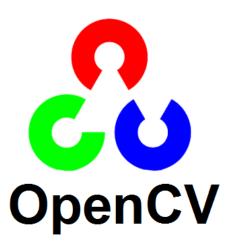


INTRODUCTION



TECHNOLOGIES USED

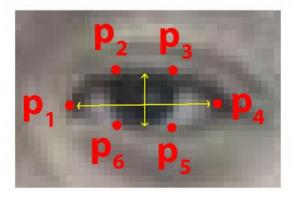






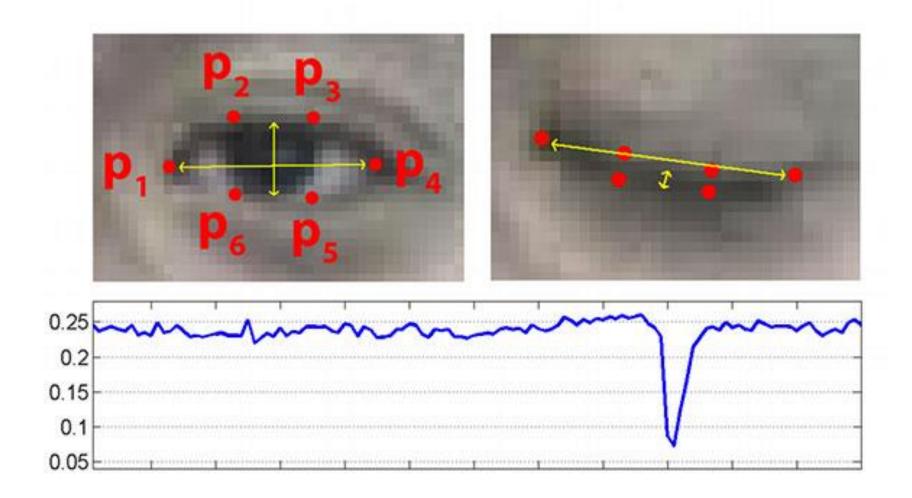
EYE ASPECT RATIO (EAR)

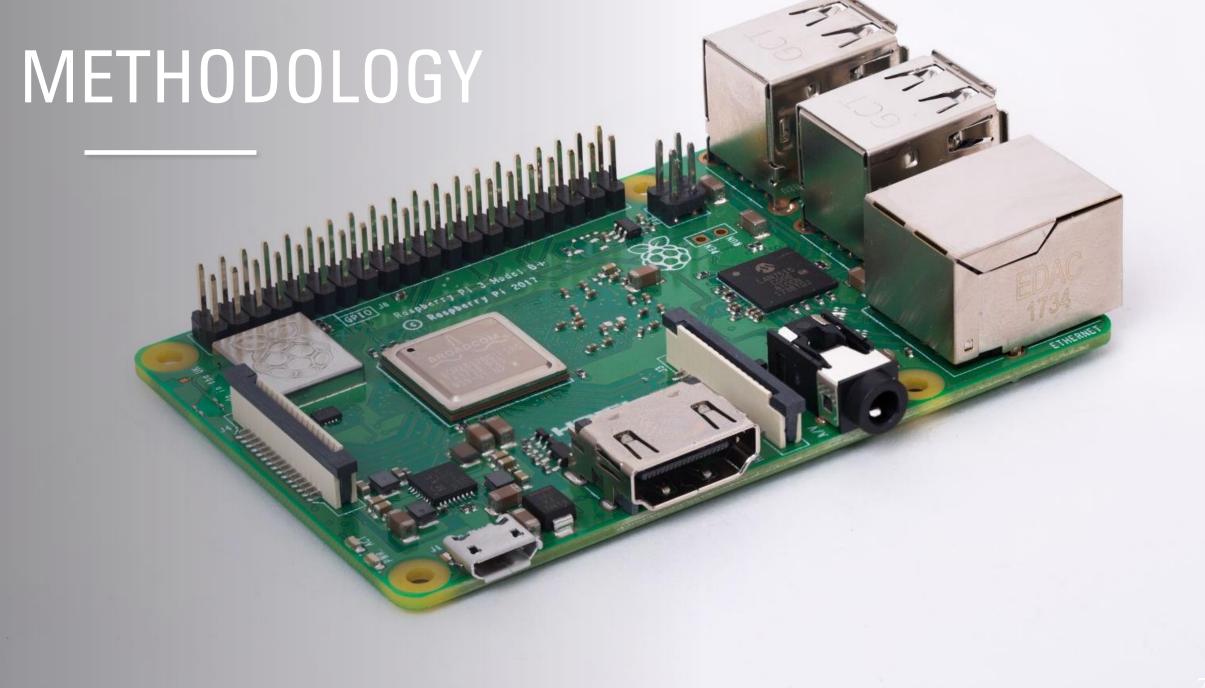
• Each eye is represented by 6(x, y)-coordinates



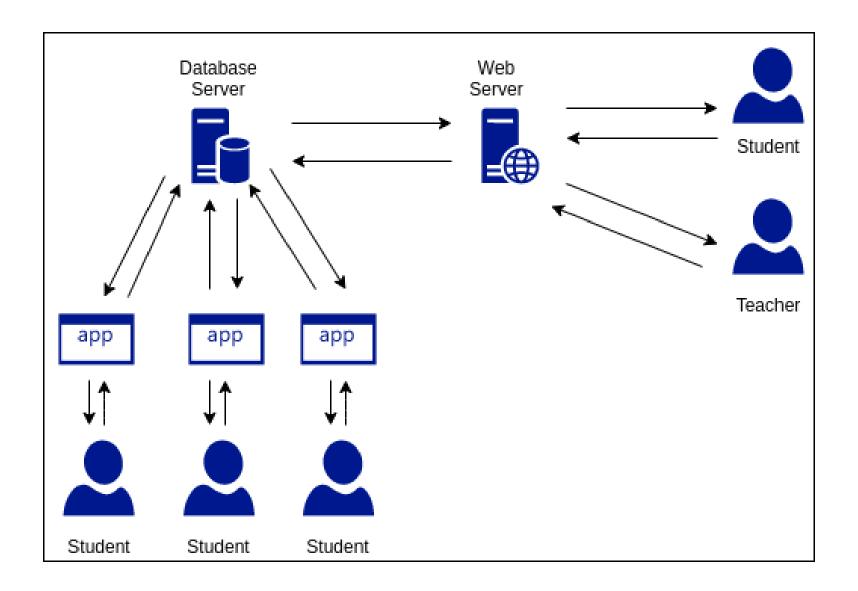
• There is a relation between the width and the height of these coordinates

$$\text{EAR} = \frac{\|p_2 - p_6\| + \|p_3 - p_5\|}{2\|p_1 - p_4\|}$$

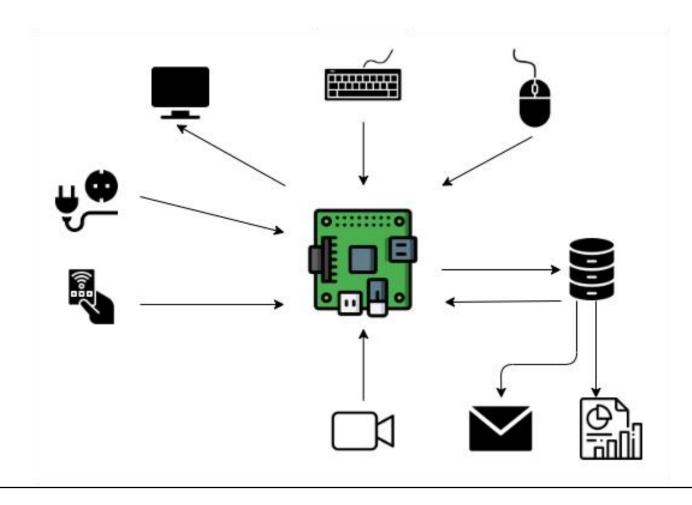


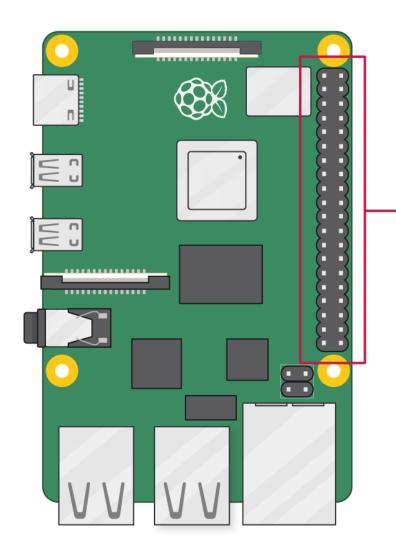


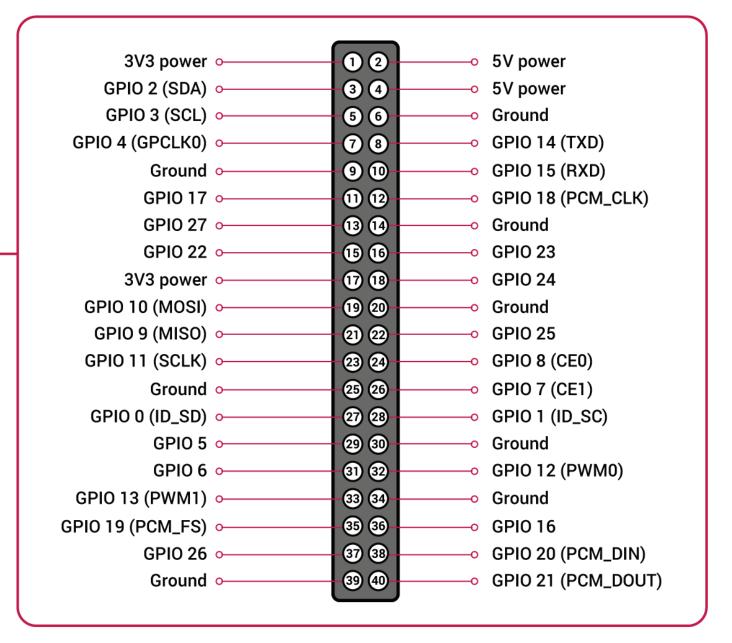
SYSTEM OVERVIEW

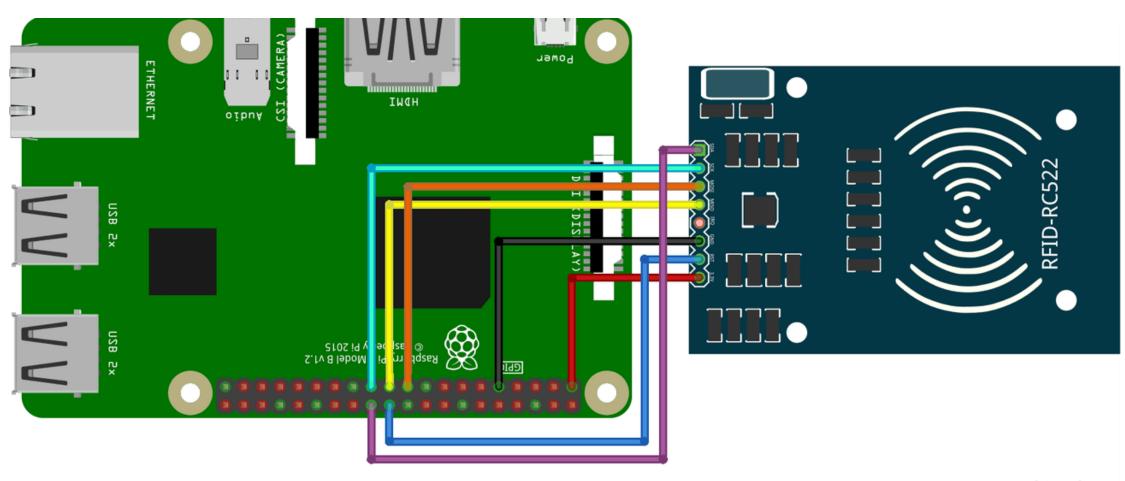


SYSTEM OVERVIEW



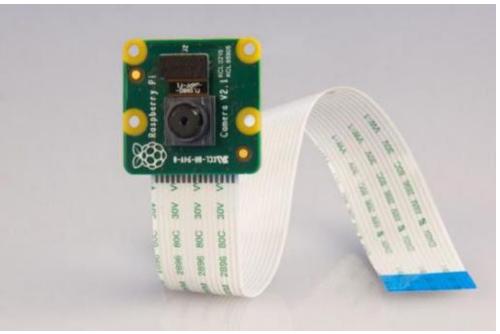






fritzing





```
self.fingerprints
          self.logdupes
            self.debug
             self.logger - logs -
                if path:
                                         self.file
                                          self.file.seek(*)
                                           self.fingerprints.
 @classmethod
def from_settings(cls,
                         debug = settings.getbool
                            return cls(job_dir(sattless)
     def request_seen(self, request_s
                               fp in self.fingerprints:
                                                          return True
                                    self.fingerprints.add(fp)
                                      if self.file:
                                                               self.file.write(fp + os.limese)
                                                                                                                                                                                                                                                                                                                 13
                                                                                             - -- remrint(self, M
```

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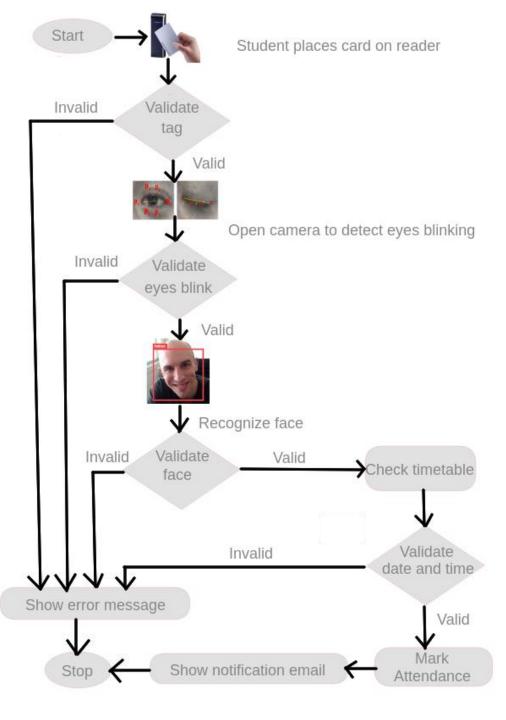
41

42

Start Enter student's name, student id, Student id email, subject codes Email Access Website Start camera and get images of face Swipe card for registering Stop

REGISTER

MARKING ATTENDANCE





WEB APP

- Html, CSS, JavaScript, Ajax, Bootstrap, etc.
- 3 roles: admin, teacher, student
- Data charts, search bar
- Login, logout with session
- Registration
- Forgot password, confirm via email token

Pill this form to create an account.

First Name

Enter First Name

Last Name

Enter Last Name

Username

Enter Username

Email

Enter Email

Password

Enter password

Confirm Password

Enter Confirm password

Register

You already have an account? Sign in now.



Login

Please fill in your credentials to login.

Username

Password

Login

Don't have an account? Sign up now.

Forgot Your Password?

U localhost/webapp/forgot_password.php

Change Password

Email

Enter Email

Change your password

You already have an account? Sign in now.

ADMIN

Class Table Add Class Data C 0 localhost/webapp/admin/add_class_table.html Add New Class Data **Home Subject Name** Day in Week Subject Code **Start Time End Time** Room Subject Code 401B4 MT1003 Calculus 1 Monday 9:00 11:50 Subject Name PH1003 Physics 1 Monday 12:00 14:50 203A4 Day in Week MT1005 Calculus 2 Tuesday 7:00 9:50 502B4 Start Time CH1003 General Chemistry 405B4 Wednesday 12:00 14:50 **End Time** Operating System 504B4 CO2013 Thursday 7:00 9:50 Room MT1007 Linear Algebra Friday 12:00 14:50 402A4 Add **Embedded Systems** 7:00 9:50 504B4 CO3053 Saturday

Attendance Table

TEACHER

View Class Members

Search | Search information

Choose a class Select >

filter

ID	First Name	Last Name	Student Number	Class Number	Clock in	Update
1	Thanh	Nguyen Truong	1652557	8	2020-11-02 09:46:00	Edit Delete
2	Thanh	Nguyen Truong	1652557	8	2020-11-09 09:30:49	Edit Delete
3	Thanh	Nguyen Truong	1652557	8	2020-11-16 09:43:58	Edit Delete
4	Thanh	Nguyen Truong	1652557	8	2020-11-23 09:43:58	Edit Delete
5	Thanh	Nguyen Truong	1652557	8	2020-11-30 09:43:58	Edit Delete
6	Thanh	Nguyen Truong	1652557	8	2020-12-07 09:43:58	Edit Delete
7	Thanh	Nguyen Truong	1652557	8	2020-12-14 09:43:58	Edit Delete

TEACHER

TOTAL STUDENT OF CLASS

Absent students

ID	First Name	Last Name	Student Number	Email
21	Chau	Nguyen Ngoc	1651017	1651017@hcmut.edu.vn
22	Hoang	Le Huy	1651025	1651025@hcmut.edu.vn
35	Khoa	Tran Nguyen Dang	1552448	1552448@hcmut.edu.vn
38	Duy	Ngo Tu	1752133	1752133@hcmut.edu.vn
39	An	Nguyen Thien	1810824	1810824@hcmut.edu.vn
41	Nguyen	Nguyen Thanh	1852618	1852618@hcmut.edu.vn
43	Toan	Nguyen Van	1552004	1552004@hcmut.edu.vn

Submit

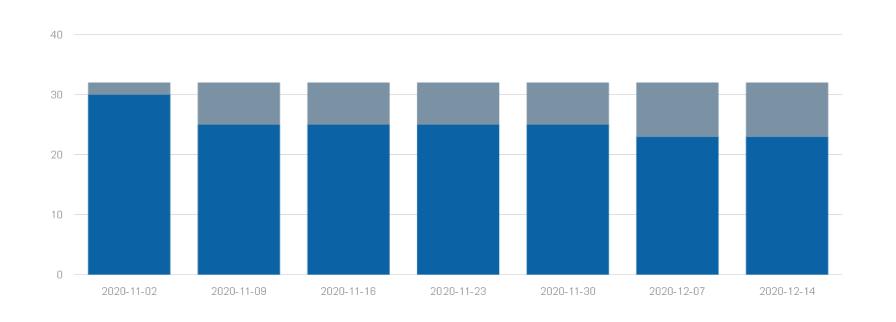
Total student: 13

Choose a class

	ID	First Name	Last Name	Student Number	Email
	3	Long	Nguyen Thanh	1655353	1655353@hcmut.edu.vn
	6	An	Tran Thien	1651001	1651001@hcmut.edu.vn
	7	Dang	Nguyen Hai	1651002	1651002@hcmut.edu.vn
	15	Nhat	Nguyen An	1651010	1651010@hcmut.edu.vn
	16	Nhat	Nguyen Tran Bao	1651011	1651011@hcmut.edu.vn
	17	Thanh	Le An	1651012	1651012@hcmut.edu.vn
	20	Minh	Nguyen Ngoc	1651016	1651016@hcmut.edu.vn

ATTENDANCE CHART

CHECKING ATTENDANCE SYSTEM Graphical of attendance

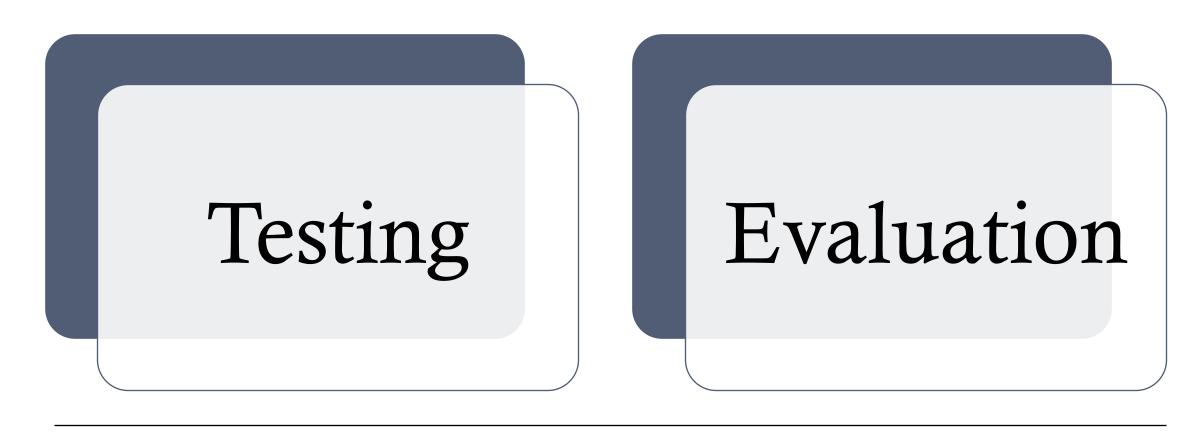


STUDENT

Attendance Table

ID	First Name	Last Name	Student Number	Class Number	Clock In
175	Quan	Nguyen Anh	1552310	8	2020-11-02 09:46:00
176	Quan	Nguyen Anh	1552310	8	2020-11-09 09:46:00
177	Quan	Nguyen Anh	1552310	8	2020-11-16 09:46:00
178	Quan	Nguyen Anh	1552310	8	2020-11-23 09:46:00
179	Quan	Nguyen Anh	1552310	8	2020-11-30 09:46:00
180	Quan	Nguyen Anh	1552310	8	2020-12-07 09:46:00
181	Quan	Nguyen Anh	1552310	8	2020-12-14 09:46:00

EVALUATION AND TESTING



TESTING

Test Case	Average time of 50 test cases (s)	Accuracy (%)
Register	91.1	\
Correct all	58	94
Wrong timetable	43.2	95
Other face in database	35.2	92
Unknown face	38.3	95
Unregistered card	27.9	100
Fake image	80.3	100





EVALUATION

Advantages

- The system is easy to setup
- Have all a checking attendance system need
- Have data chart
- Low cost

Disadvantages

- Timing constraint
- Low capacity of RAM
- User interface is not good

CONCLUSION

Contributions

Future Works



CONTRIBUTIONS

- Give a solution to check student attendance using IoT devices.
- Combine RFID and Facial recognition
- Detect fake image of faces

FUTURE WORK



- Setup web server and database server to another hosting
- Move the project to the stronger system
- Use other methods to improve the efficiency of antispoofing to replace eye blink detection
- Create a better user interface
- Improved code logic of the system

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matter holds that process in a strology regulation at the so, i and the Shortly IA NY QUESTION? rly felthe late election in 1967 tengan's You swearing in its governor of California after his election in 1966 has been linked to to do or not do so you your astrological signs oneastrological favorable or unfavorable

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C Knight-Ridder Newspapers

Letters intended for publication should be addressed " Letters to the Editor" and contain the writer's signature, name and full address, Letters should be brief and are subject to editing. We cannot be responsible for the return of unsolicited manyscripts.

Collection

nies. But given Mr. Reagan's long-standng interest in astrology, and the White Iouse acknowledgment that he has relied on it for some purposes, what is the basis for confidence that he has not relied on this crackpot pseudoscience for others?

The spectacle of astrology in the White House - governing center of the world's greatest scientific and military poweris so appalling that it defies understanding and provides grounds for great fright. The easiest response is to laugh it off, and to indulge in wisecracks about civil service ratings for horoscope makers and palm readers and whether Mr. Reagan asked Mikhail Gorbachev for his sign.

A cibtagious good cheer is the hallmark of this presidency, even where the most dismal matters are concerned. Th time, It isn't funny. It's plain scary.

-Science wrue Daniel S, Greenbe

in: syndicated colum-

International Business Knowlage Center

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"My whole strategy. plained, "Is if the burge takes as the way out, that's the one." This made water, and I waterbeen