

□ □ □
□ 1pt
scrheadings

1 □ □ □

FOM

-

Hochschule

für

Oekonomie

&

Man-

age-

ment

Hamburg

Master-

Studiengang

Big

Data

&

Busi-

ness

An-

a-

lyt-

ics

3.

Semester

**Development
of
a
chat-
bot
to
im-
prove
pro-
cess
of
pa-
tient
man-
age-
ment
and
documentation
of
dis-
eases
and
their
symp-
toms**

Betreuer:

Prof.

Dr.

Kai

Brüssau

Autor:

Jacque-

line

Franßen

Matrikel-

Nr:

496804

3.

Fachsemester

Hamburg,

den

28.02.2020

Contents

1	Abstract	2
2	Introduction	3
3	Related	
	work	4
4	Time	
	se-	
	ries	
	anal-	
	y-	
	sis	
	and	
	fore-	
	cast-	
	ing	5
4.1	General	
	de-	
	scrip-	
	tion	5

4.2 Examples
and
pos-
si-
ble
use
cases 5

4.3 Python
li-
brary
'StatsMod-
els' 5

5 African Eco- nomic His- tory 6

5.1 Inflation 6

5.2 Exchange
rate 6

5.3 African
eco-
nomic
cri-
sis
and
its
causes 6

5.4 Data

source:

Kag-

gle

Dataset

'Africa

Eco-

nomic,

Bank-

ing

and

Sys-

temic

Cri-

sis

Data' 6

6 Development

of

a

so-

lu-

tion

for

time

se-

ries

anal-

y-

sis

and

fore-

cast-

ing

of

african

eco-

nomic

data 7

6.1 Problems

and

chal-

lenges

of

dur-

ing

data

anal-

y-

sis 7

6.2 First
steps:
Draft
of
de-
vel-
oped
so-
lu-
tion 7

6.3 Proposed
so-
lu-
tion 7

6.4 Results 7

7 Conclusion and Out- look 8

7.1 Lessons
learned 8

7.2 Conclusion 8

7.3 Outlook 8

8 Abbreviations 9

9 Appendix A 10

10 Appendix B 11

List of Fig- ures

List of Ta- bles

1 Abstract

Business

Case:

1)

With

the

de-

vel-

oped

so-

lu-

tion,

doc-

tors

are

get-

ting

an

overview

of

the

pa-

tient's

blood

pres-

sure

val-

ues.

This

makes

them

re-

act

more

pre-

cisely

to

any

spe-

cial

val-

ues.

2)

Since

the

pa-

tient

is

lead

through

a

tu-

to-

rial

and

the

chat-

bot

is

'con-

trol-
ling'/'checking'
his
mea-
sured
blood
pres-
sure
val-
ues,
all
mea-
sure-
ments
are
taken
more
ac-
cu-
rately.
This
im-
proves
the
pro-
cess
of
doc-
u-
men-
ta-
tion.
3)

With
the
ser-
vice
of
send-
ing
a
re-
port
via
email
ev-
ery
two
weeks
to
the
doc-
tor.
The
doc-
tor
has
al-
ways
the
cur-
rent
value
and
can
in-

ter-
prete
them
faster.
(now
they
are
only
get-
ting
a
long
list
of
all
mea-
sured
val-
ues
of
their
pa-
tients
which
they
have
to
in-
ter-
prete
on
their
own

and

4)

Rec-
om-
men-
da-
tion
sys-
tem
of
the
near-
est
doc-
tor
helps
the
pa-
tient
to
di-
rectly
go
to
his
doc-
tor
Jack:
'Hey,
i
found

these
near-
est
doc-
tors/specialists
in
your
neigh-
bour-
hood.
Just
se-
lect
one
of
them
and
make
an
ap-
point-
ment
with
them.

2 Introduction

Aim
of
this
sci-
en-
tific
work
is
to
de-
velop
a
so-
lu-
tion
to
doc-
u-
ment
blood
pres-
sure
in
or-
der
to

re-
act
pre-
ven-
tively
against
heart
dis-
ease.

To
rec-
om-
mend

an
ap-
pro-
pri-
ate

doc-
tor

in
one's
sur-
round-
ing

(ap-
prox-

i-
mately

5
kilo-
me-
ters

of
dis-
tance).

The
ap-
pli-
ca-
tion
shall
send

ev-
ery
week/every

two
weeks

a
re-
port

(in-
clud-
ing

a
di-
a-
gramm

of
all
mea-
sured
blood
pres-
sure
val-

ues
of
the
pa-
tient)
to
the
doc-
tor
so
that
the
doc-
tor
will
be
in-
formed
in
real-
time.
In
the
di-
a-
grams/frontend,
it
is
pos-
si-
ble
to
se-

lect
dif-
fer-
ent
scales,
e.g.
like
the
val-
ues
of
last
week/last
month/last
year.
At
the
be-
gin-
ning
of
us-
ing
the
Chat-
bot,
the
user
is
be-
ing
led
through

a
tu-
to-
rial
which
shows
him
how
to
mea-
sure
cor-
rectly
his
blood
pres-
sure.
One
in-
struc-
tion
is
for
ex-
am-
ple
not
to
drink
cof-
fee
be-
fore

mea-
sur-
ing
your
blood
pres-
sure
or
to
sit
for
at
least
5
min-
utes.

3 Related work

-

nicht

zu

de-

tail-

re-

ich

-

Problemstellung

-

Methoden

(welche

Meth-

o-

den

eingesetzt?)–

¿

wenn

nur

1,

wieso

nicht

2/3?

-

Vorgehen

-

Challenges

-

verschiedene

Vari-

anten

nen-

nen

—

¿

Vorge-

hen

wird

be-

w-

ertet

nicht

-

Ziel

beschreiben

-

Durchführung

-

wie

wurde

Ziel

er-

re-

icht?

—

¿

Blood

Pres-

sure

Apps:

Was

können

die

schon

?

[https://freeappsforme.com/apps-](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

[to-](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

[measure-](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

[blood-](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

[pressure/cardio-](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

[journal](https://freeappsforme.com/apps-to-measure-blood-pressure/cardio-journal)

4 Development of a chat- bot

4.1 Defining chat- bot's per- son- al- ity

—

¿

Jack

4.2 General

de-

scrip-

tion

Data

re-

trievel

-

chal-

lenges

-

miss-

ing

val-

ues

?

-

how

to

make

pre-

cise

di-

ag-

no-

sis

4.3 Organizations

for

heart

dis-

ease

<https://www.heart.org/en>

4.4 Examples

and

pos-

si-

ble

use

cases

5 Architecture of de- vel- oped sys- tem

connection

fron-

tend

(an-

gu-

larjs

web-

page)

to

mon-

godb

through

socket.io

con-
nec-
tion.
Con-
nec-
tion
be-
tween
Wat-
son
As-
sis-
tant
and
Fron-
tend
through
mon-
godb
and
via
socket.io
con-
nec-
tion.

6 Development

pro- cess

6.1 Data

re- trieval

6.1.1 Kaggle Dataset

<https://www.kaggle.com/mkachuee/BloodPressureDataset>

6.2 Data

**prepa-
ra-
tion**

6.3 Development

**of
Wat-
son
As-
sis-
tant
Di-
a-
log**

6.3.1 Intent model

The
chat-
bot
was
built
ac-
cord-
ing

to
the
de-
scrip-
tion
of
"Deutsche
Hochdruck-
liga",
a
ger-
man
or-
ga-
ni-
za-
tion
for
pa-
tients
with
hy-
per-
to-
nia
¹.
To
bet-
ter
un-
der-

¹ cf. [hochdruckliga]

stand
the
users
and
pa-
tients
a
ba-
sic
in-
tent
model
with
five
in-
tents
was
de-
vel-
oped.
The
five
in-
tents
in-
clude
These
five
in-
tents
were
used
to

de-
fine
and
de-
velop
five
typ-
i-
cal
di-
alogs.

6.4 Setup of Mon- goDB and ba- sic An- gu- larJS Fron- tend

6.5 Connect Wat- son As- sis- tant to Fron- tend and Mon-

out-
look:
maybe
in
fu-
ture
to
con-
nect
to
the
doc-
tors'
cal-
en-
dar
to
di-
rectly
make
an
ap-
point-
ment
through
the
chat-
bot

**6.8 Development
of
email
ser-
vice
to
send
re-
ports
ev-
ery
two
weeks
to
the
doc-
tor**

7 Development

of

a

so-

lu-

tion

for

time

se-

ries

anal-

y-

sis

and

fore-

cast-

ing

8 Conclusion and Out- look

8.1 Lessons learned

8.2 Conclusion

8.3 Outlook

9 Abbreviations

Hypertonie_{Defini} Hypertonie_{Scha} Hypertonie_{ER} Hypertonie_{Symp} Hypertonie_{MA} **ARIMA**
Autoregressive
In-
te-
grated
Mov-
ing
Av-
er-
age
Model

10 Appendix

A

[]Ehrenwörtliche

Erklärung

37

Ehrenwörtliche

Erklärung

Hiermit

ver-

sichere

ich,

dass

die

vor-

liegende

Ar-

beit

von

mir

selb-

stständig

und

ohne

uner-
laubte
Hilfe
ange-
fer-
tigt
wor-
den
ist,
ins-
beson-
dere
dass
ich
alle
Stellen,
die
wörtlich
oder
annähernd
wörtlich
aus
Veröffentlichun-
gen
ent-
nom-
men
sind,
durch
Zi-
tate
als
solche

gekennze-
ich-
net
habe.
Ich
ver-
sichere
auch,
dass
die
von
mir
ein-
gere-
ichte
schriftliche
Ver-
sion
mit
der
dig-
i-
talen
Ver-
sion
übere-
in-
stimmt.
Weit-
er-
hin
erkläre
ich,

dass
die
Ar-
beit
in
gle-
icher
oder
ähn-
licher
Form
noch
keiner
Prüfungs-
behörde
/
Prüfungsstelle
vorgele-
gen
hat.
Ich
erkläre
mich
damit
nicht
ein-
ver-
standen,
dass
die
Ar-
beit
der

Öffentlichkeit

zugänglich

gemacht

wird.

Ich

erkläre

mich

damit

ein-

ver-

standen,

dass

die

Dig-

i-

talver-

sion

dieser

Ar-

beit

zwecks

Pla-

giat-

sprüfung

auf

die

Server

ex-

terner

An-

bi-

eter

hochge-

laden
wer-
den
darf.
Die
Pla-
giat-
sprüfung
stellt
keine
Zurverfügung-
stel-
lung
für
die
Öffentlichkeit
dar.

Ort,
Da-
tum
(Vor-
name
Nach-
name)

11 Appendix

B