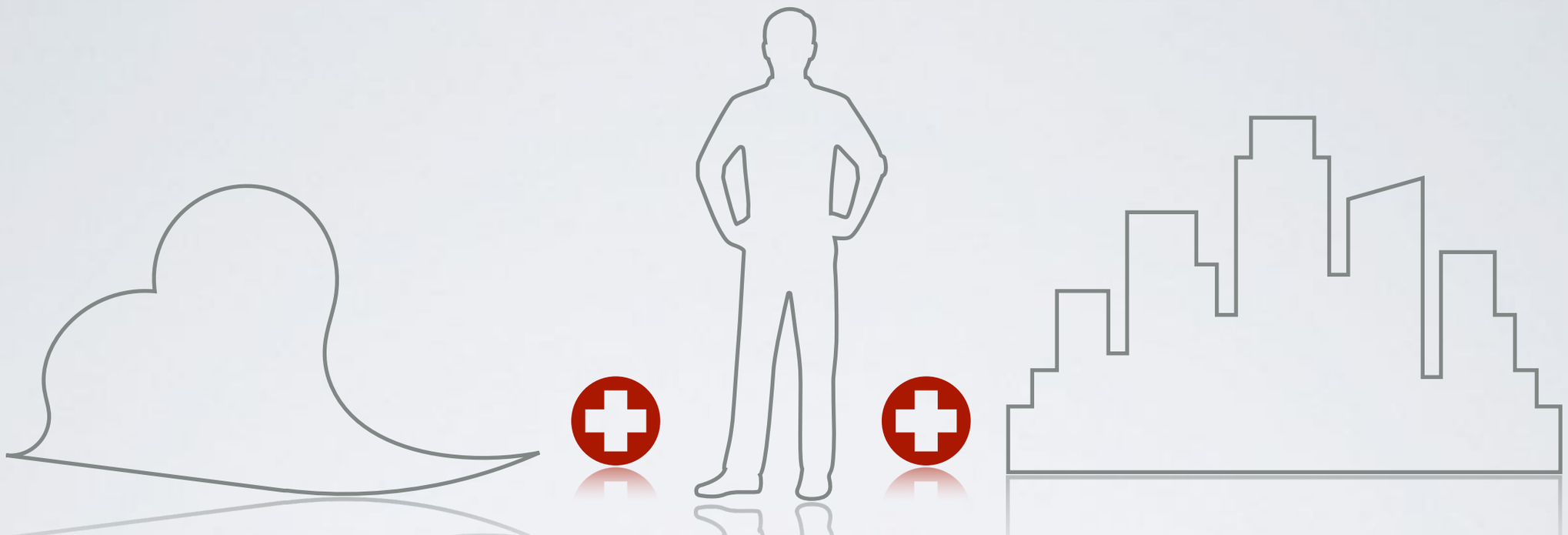
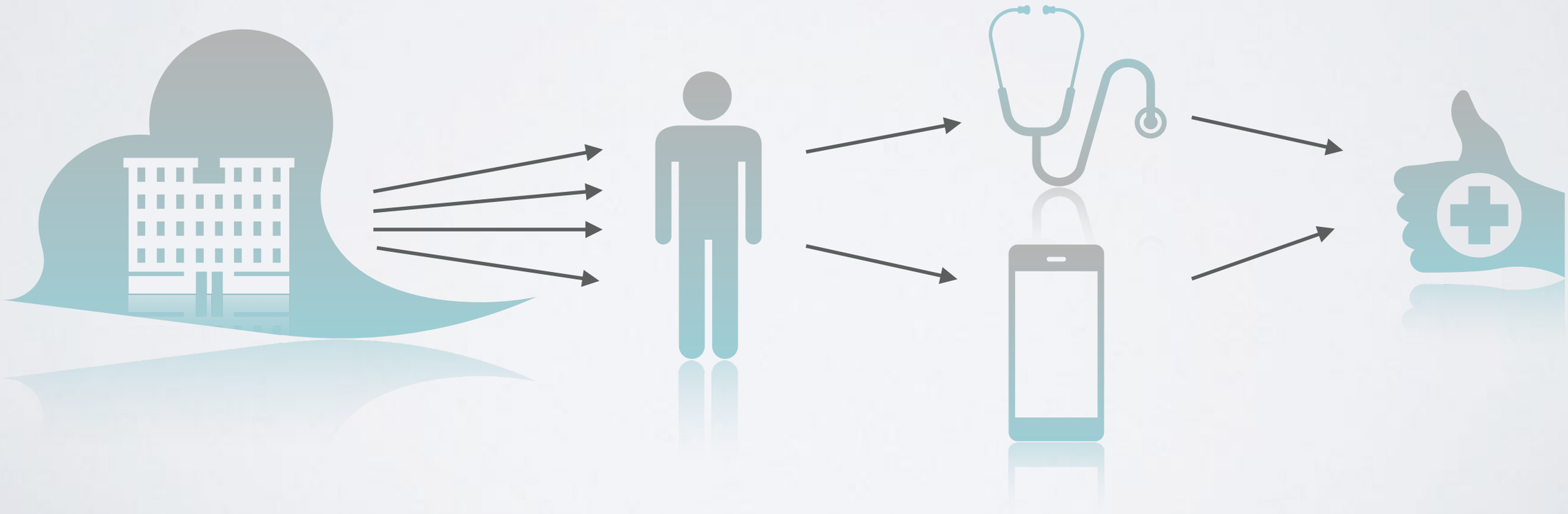


FOG HEALTH ADVISER

Zhang, Qifan Chen, Yiwen Li, Dinghong Du,Jia

Introduction-Idea

In this project, we evaluate ***personal life style*** by using data from sensors in fog computing systems.
Users can get reasonable ***advice*** or ***warning*** about their status of health, and doctors can get an overview of patient health.

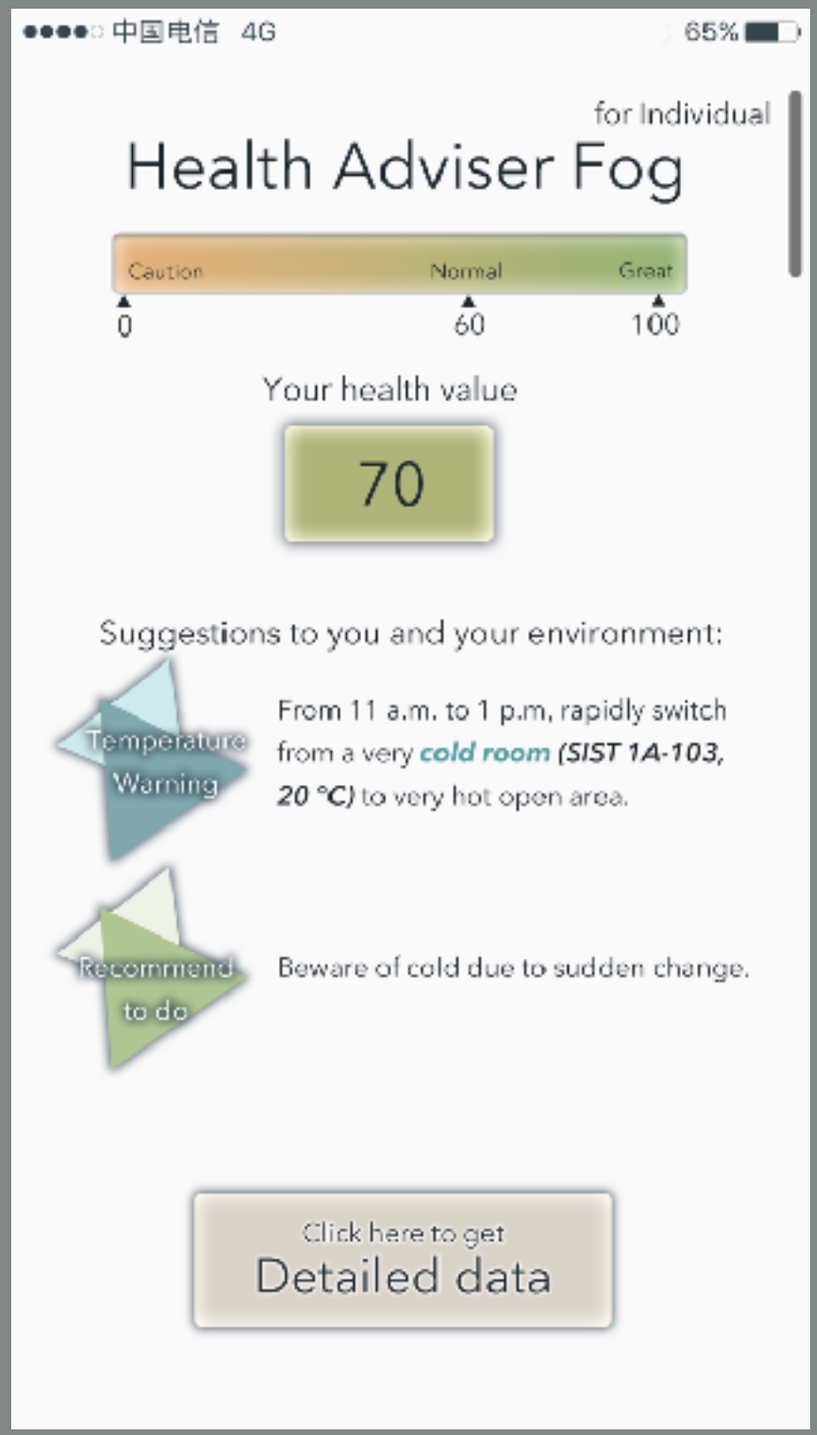


Health Adviser Fog

(HAF)

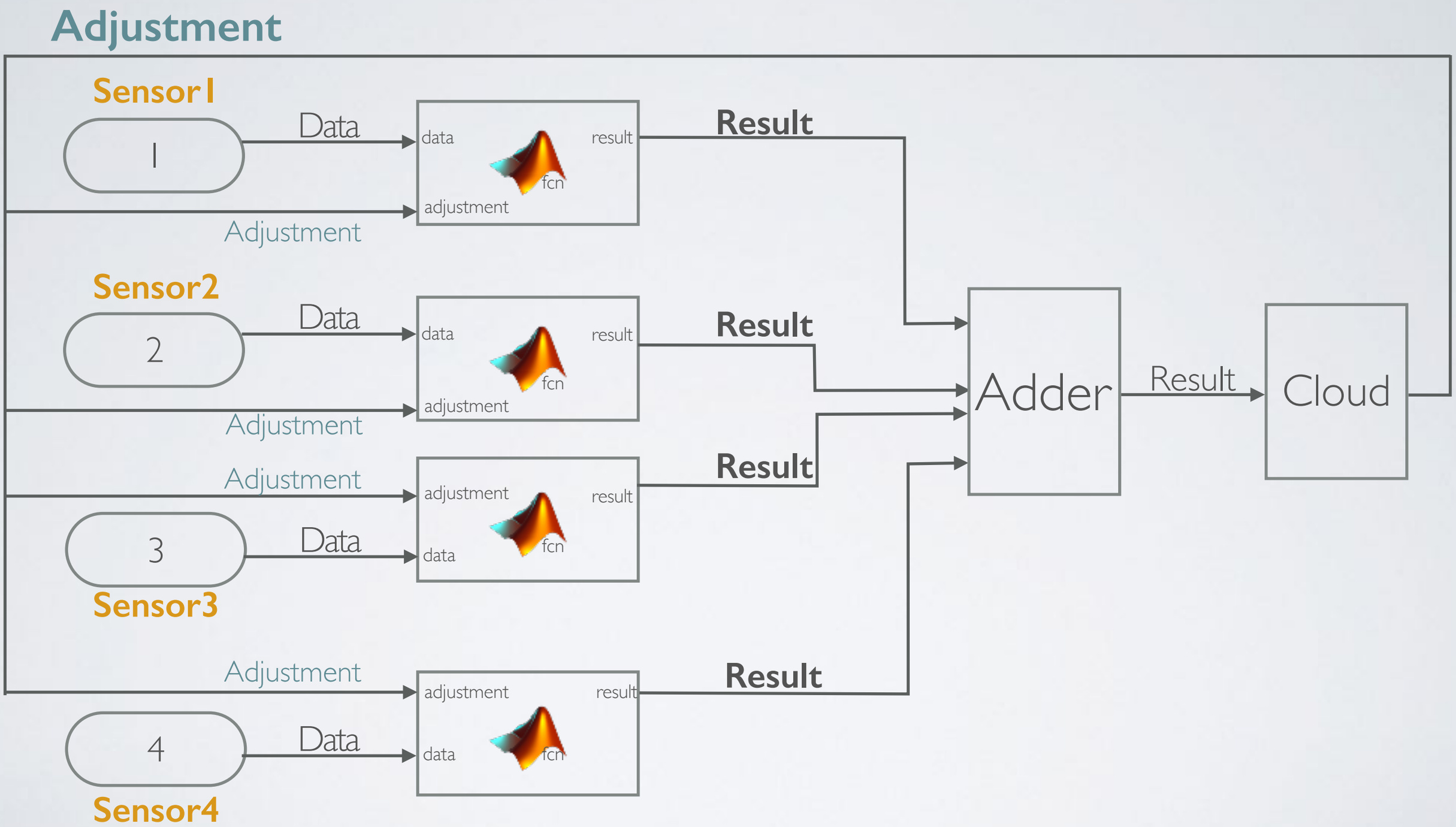
Fog computing systems play a critical role in our system.
We can introduce great ideas and design philosophy of computer systems into this real system.

Make common things efficient.
Make uncommon things possible.



Two Versions

Layout


Adjustment
Sensor1
1
Data
data
result
fcn
adjustment
Result
Adjustment
Sensor2
2
Data
data
result
fcn
adjustment
Result
Adjustment
Adjustment
adjustment
result
fcn
data
Result
3
Data
Sensor3
Adjustment
adjustment
result
fcn
data
Result
4
Data
Sensor4
Adder
Result
Cloud

Algorithm

$$\begin{bmatrix} Electricity_{1\times n} \\ Water_{1\times m} \\ Gas_{1\times k} \end{bmatrix} \cdot \begin{bmatrix} C1_{n\times 100} \\ C2_{m\times 100} \\ C3_{k\times 100} \end{bmatrix} = [Electricity_{1\times n}]\cdot[C1_{n\times 100}]+[Water_{1\times m}]\cdot[C2_{m\times 100}]+[Gas_{1\times k}]\cdot[C3_{k\times 100}]$$

Cloud

Node 1

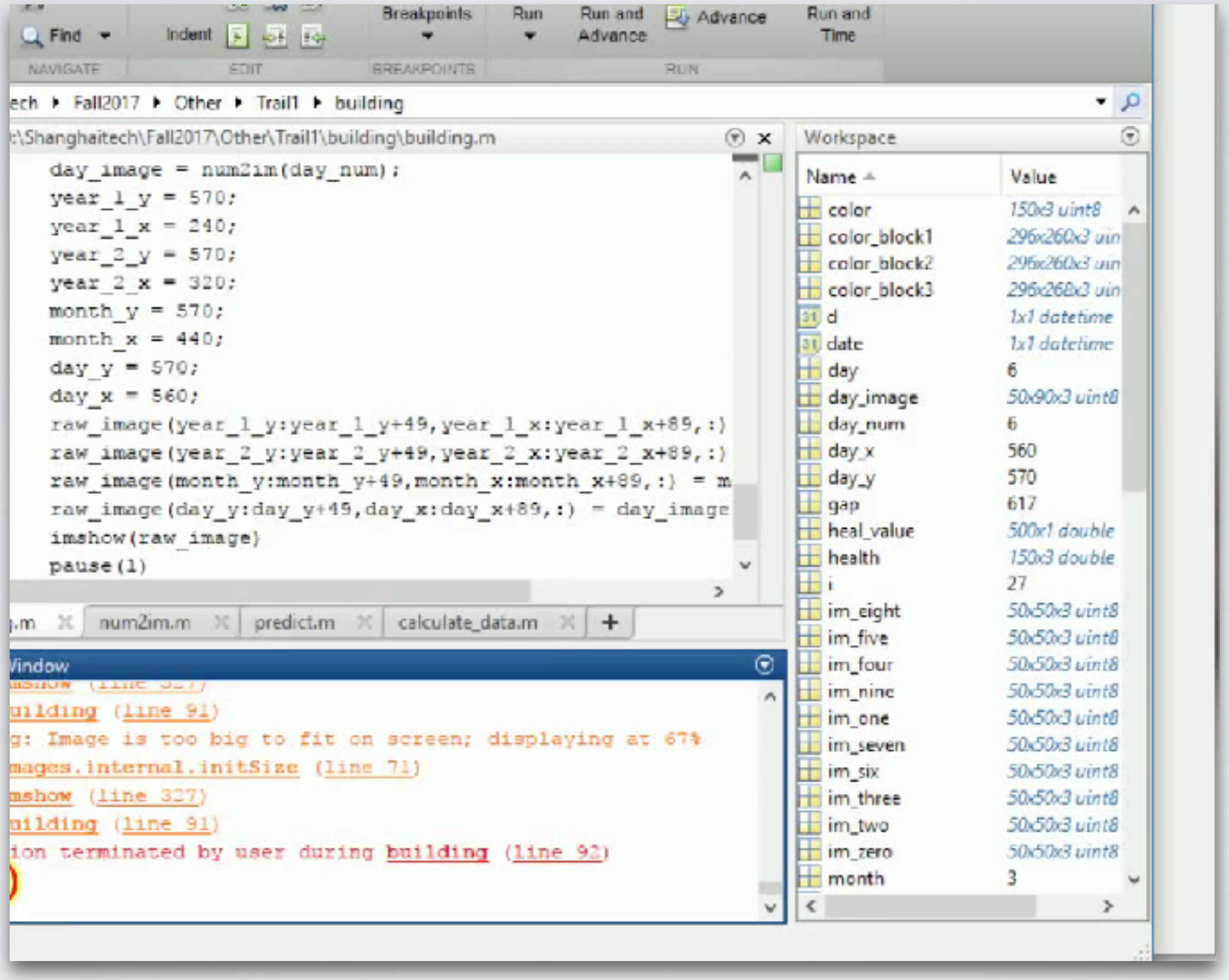
Node 2

Node 3

Fog

In this project, we use ***multi class classification machine learning algorithm*** as our main algorithm.
We use the data of electricity, water, and gas usage, which is all sampled once per minute.
We divide the original matrix operation into three separate parts and find that it suits fog computing very well.

Implement


Find
Indent
Breakpoints
Run
Run and Advance
Advance
Run and Time
NAVIGATE
EDIT
BREAKPOINTS
RUN
ech ▸ Fall2017 ▸ Other ▸ Trail1 ▸ building
:\Shanghaitech\Fall2017\Other\Trail1\building\building.m
day_image = num2im(day_num);
year_1_y = 570;
year_1_x = 240;
year_2_y = 570;
year_2_x = 320;
month_y = 570;
month_x = 440;
day_y = 570;
day_x = 560;
raw_image(year_1_y:year_1_y+49,year_1_x:year_1_x+89,:)
raw_image(year_2_y:year_2_y+49,year_2_x:year_2_x+89,:)
raw_image(month_y:month_y+49,month_x:month_x+89,:) = m
raw_image(day_y:day_y+49,day_x:day_x+89,:) = day_image
imshow(raw_image)
pause(1)
.m
num2im.m
predict.m
calculate_data.m
Window
uilding (line 91)
g: Image is too big to fit on screen; displaying at 67%
mages.internal.initSize (line 71)
mshow (line 327)
uilding (line 91)
ion terminated by user during building (line 92)
Workspace
Name
Value
color 150x3 uint8
color_block1 296x260x3 uin
color_block2 296x260x3 uin
color_block3 296x260x3 uin
d 1x1 datetime
date 1x1 datetime
day 6
day_image 50x90x3 uint8
day_num 6
day_x 560
day_y 570
gap 617
heal_value 500x1 double
health 150x3 double
i 27
im_eight 50x50x3 uint8
im_five 50x50x3 uint8
im_four 50x50x3 uint8
im_nine 50x50x3 uint8
im_one 50x50x3 uint8
im_seven 50x50x3 uint8
im_six 50x50x3 uint8
im_three 50x50x3 uint8
im_two 50x50x3 uint8
im_zero 50x50x3 uint8
month 3

What can HAF do?

Check health state in real time and find possible cause from environment

Help doctors to diagnose patient

Give suggestions according to risky environments (eg. a low-temperature room)

…

Innovation

Things to compare	Traditional Health Managing App	Health Adviser Fog (HAF)
Width	***Limited data***	***Lots of categories***
Accuracy	***Lean on self-report, subjective***	***Real data, objective***
Reliability	***Only for reference***	***Can use as evidence***

Challenges

Training Set

Private

Why FOG?

Distributed computing:
distributed computing: how we use fog computing.

Reliability by redundancy:
If a node does not work, the system will not fail.

Locality
Save the energy in transfer.

Future Development

More application with *Wearable Equipments*.

Larger Training Set

Let's **HAF** a healthier life.