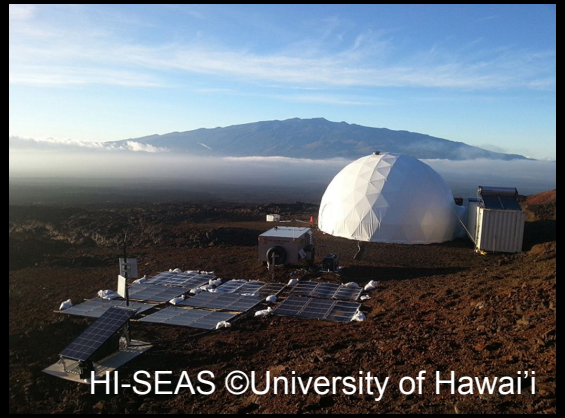
30 Sensors to Mars: Toward Distributed Support Systems for Astronauts in Space Habitats

Inga Rüb · Maciej Matraszek · Dominik Batorski · Konrad Iwanicki
Małgorzata Perycz · Aleksander Waśniowski

analog habitats & astronautic simulations

Parabolic flight ©ESA

Aquarius Reef Base ©NOAA

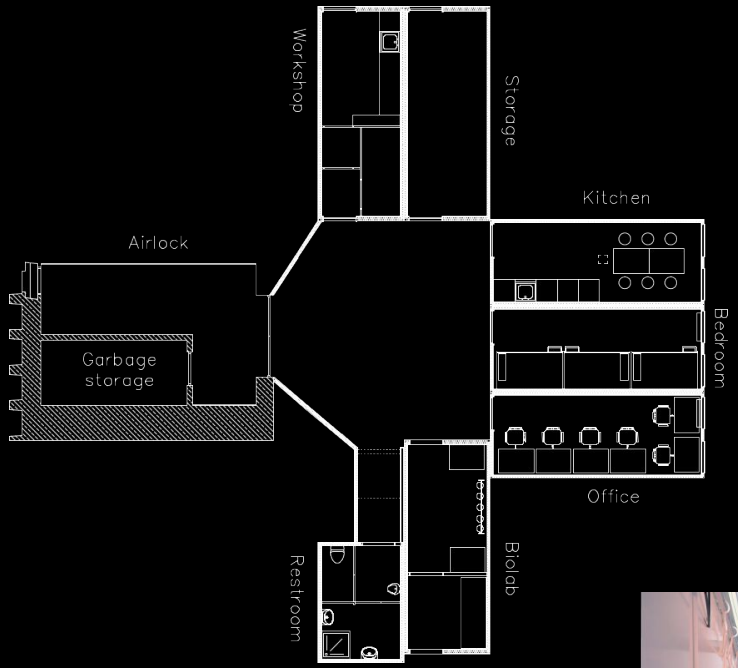

HI-SEAS ©University of Hawai'i

Concordia ©ESA

Human Exploration Research Analog (HERA) ©NASA

MDRS ©Mars Society

LunAres Habitat

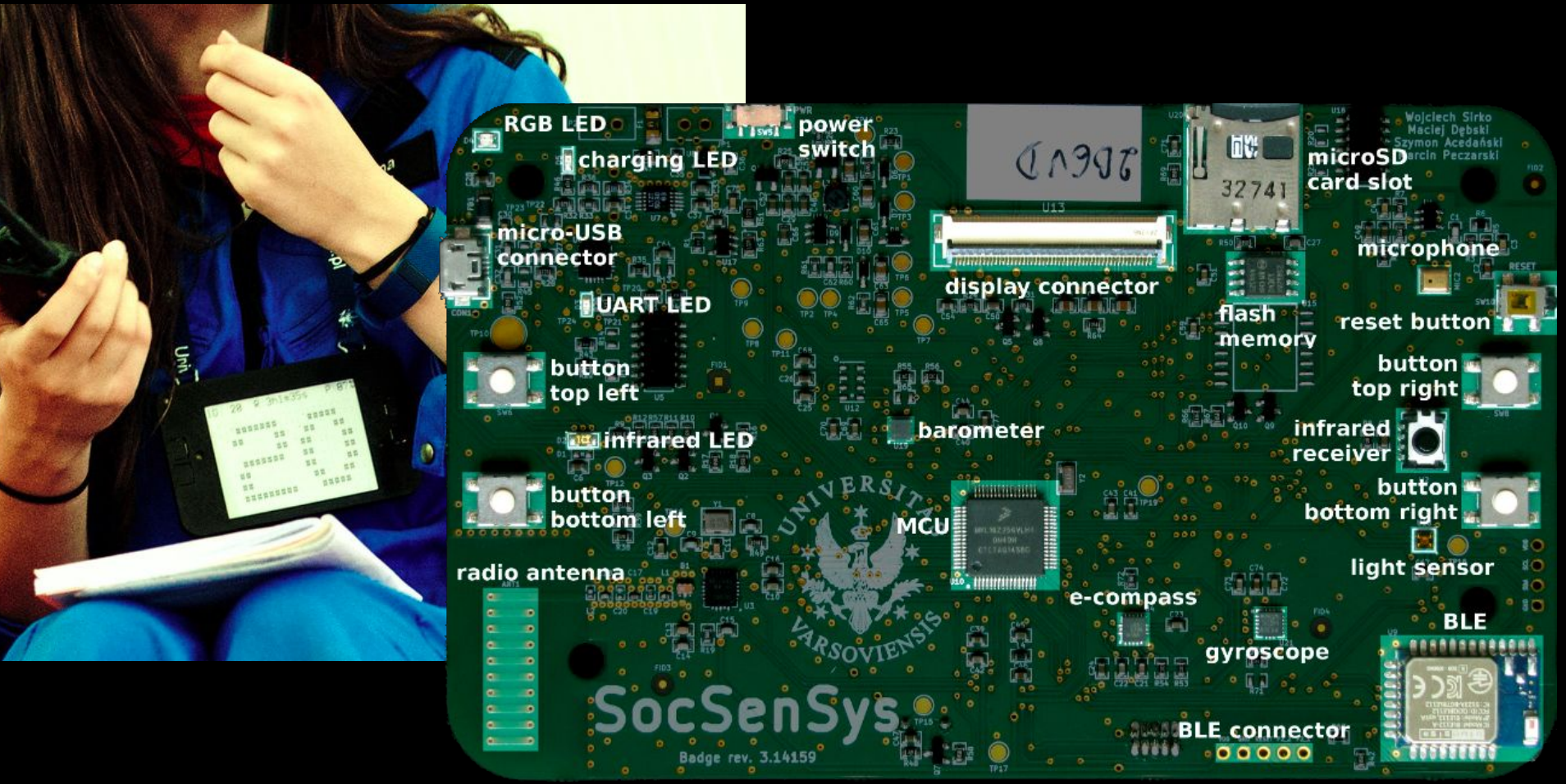


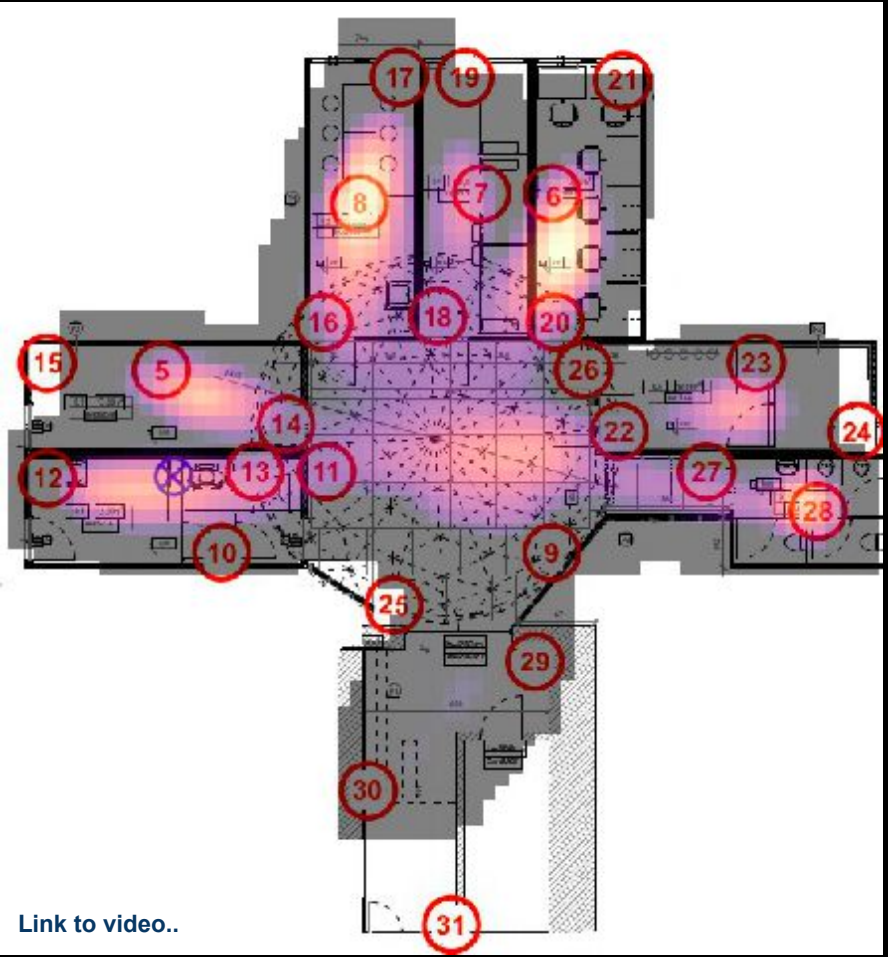
Technology

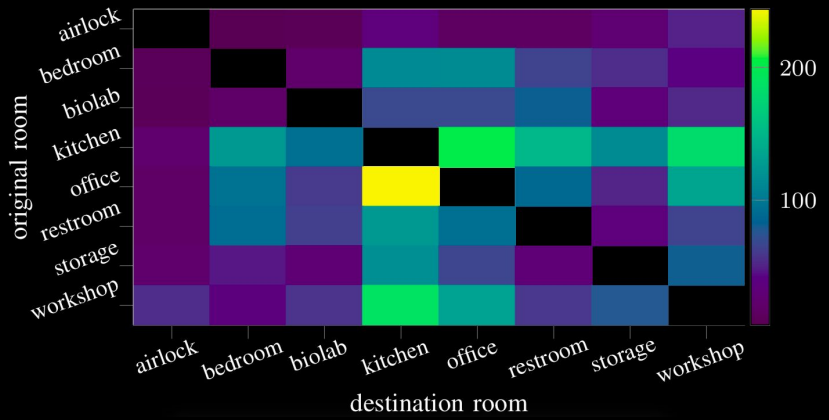
Science

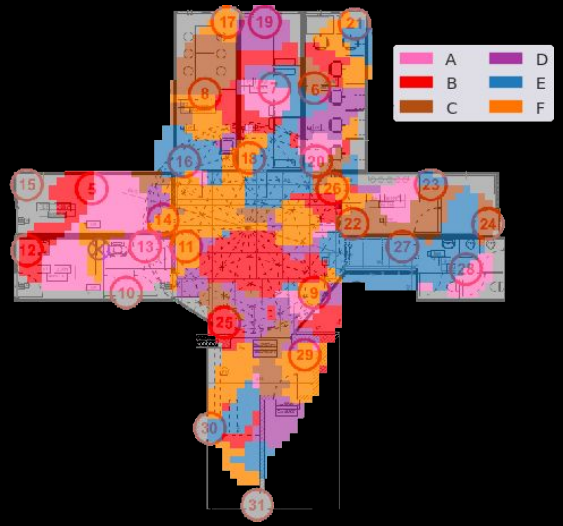
Crew

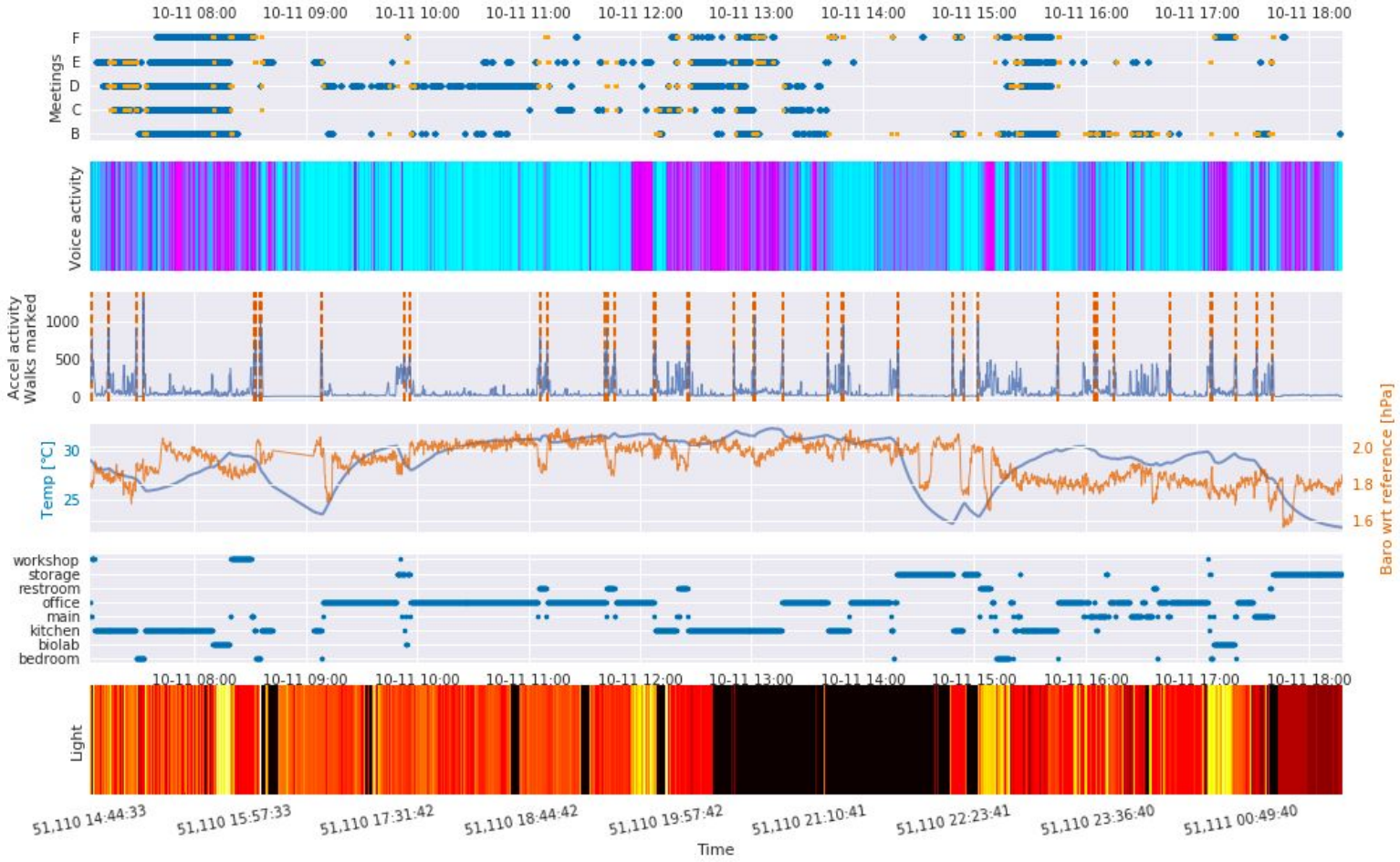
Wojciech Sirko
Maciej Dębski
Szymon Acedański
Marcin Peczarski
flash memory
gyroscope
UNIVERSITAS VARSOVIENSIS
SocSenSys
Badge rev. 3.14159


RGB LED
power switch
charging LED
microSD card slot
micro-USB connector
microphone
display connector
UART LED
flash memory
reset button
button top left
button top right
infrared LED
barometer
infrared receiver
button bottom left
MCU
button bottom right
radio antenna
light sensor
e-compass
BLE
gyroscope
SocSenSys
BLE connector
Badge rev. 3.14159


Link to video..


original room
airlock
bedroom
biolab
kitchen
office
restroom
storage
workshop
destination room
200
100


A
B
C
D
E
F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10-11 09:00
10-11 10:00
10-11 11:00
10-11 12:00
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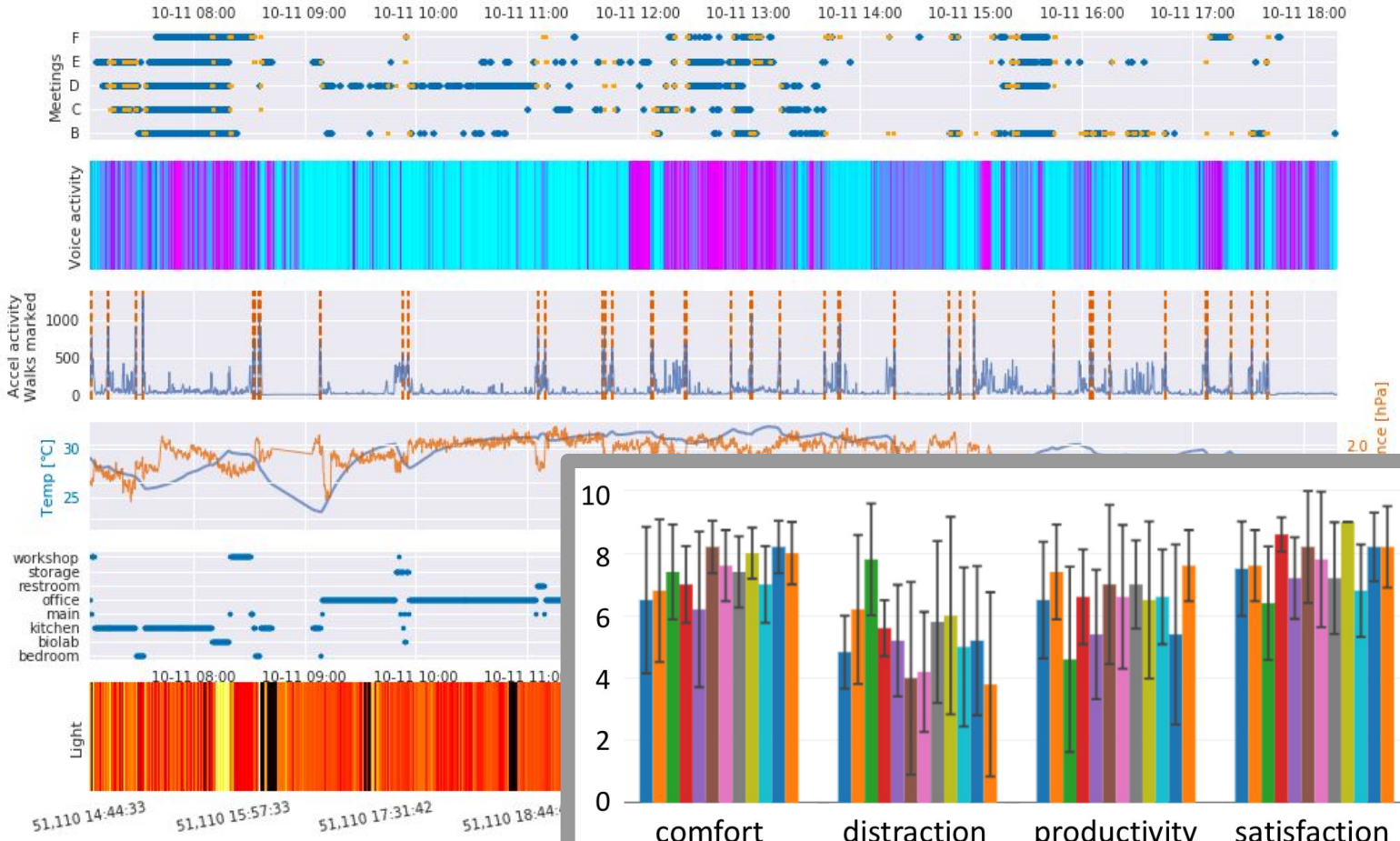
10-11 14:00
10-11 15:00
10-11 16:00
10-11 17:00
10-11 18:00
Meetings
F
E
D
C
B
Voice activity
Accel activity
Walks marked
1000
500
0
Temp [°C]
30
25
Baro wrt reference [hPa]
2.0
1.8
1.6
workshop
storage
restroom
office
main
kitchen
biolab
bedroom
Light
51,110 14:44:33
51,110 15:57:33
51,110 17:31:42
51,110 18:44:42
51,110 19:57:42
51,110 21:10:41
51,110 22:23:41
51,110 23:36:40
51,111 00:49:40
Time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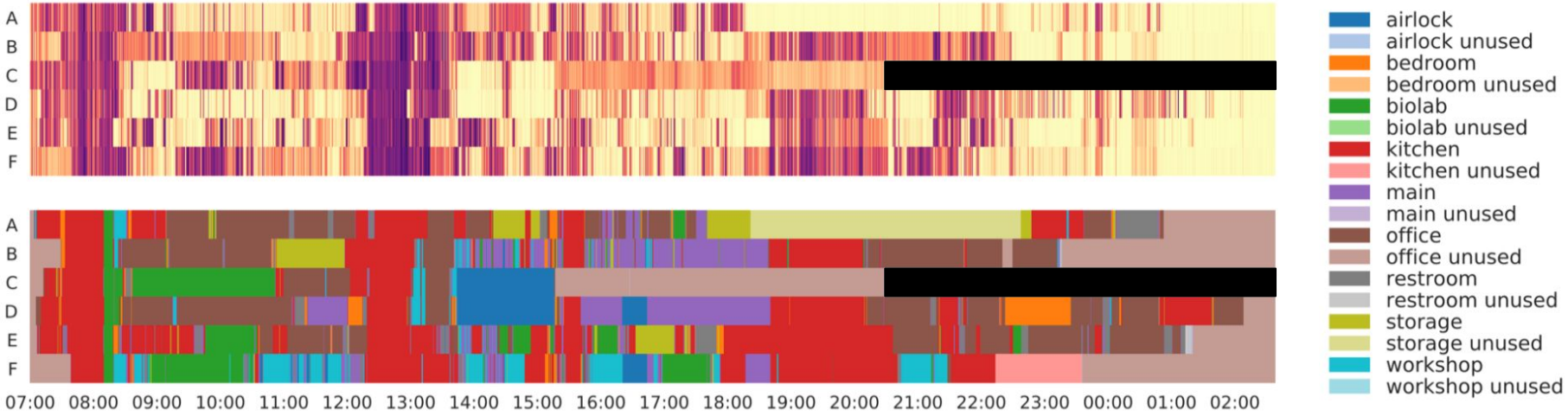
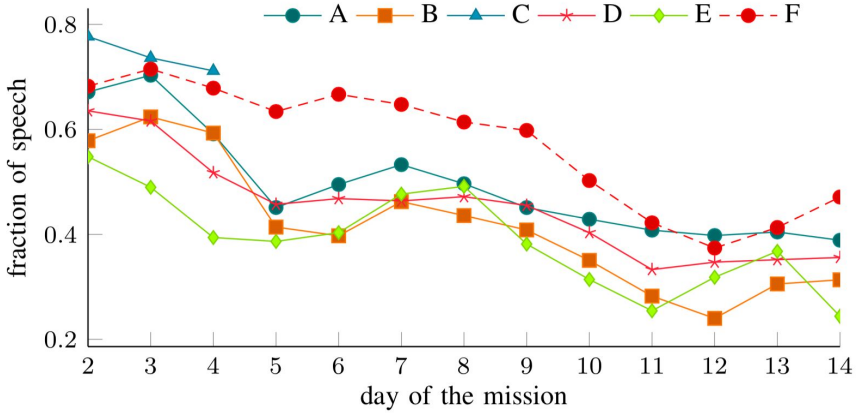
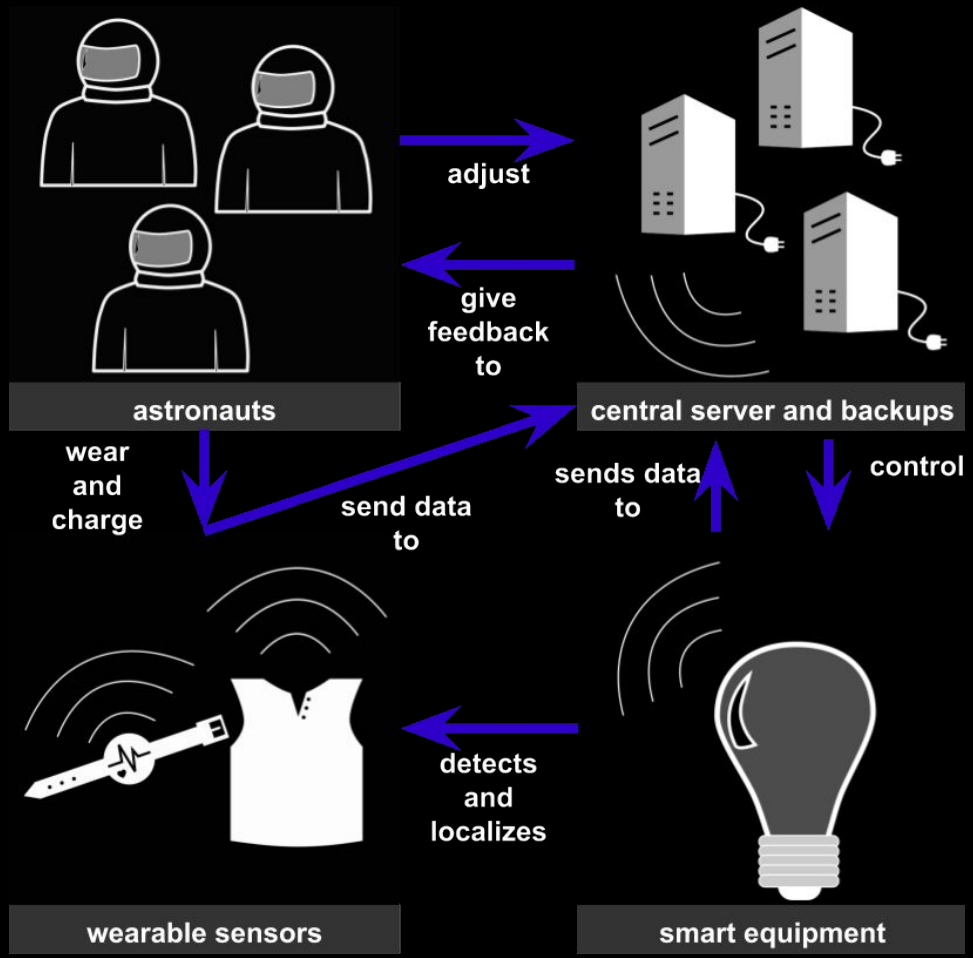
10-11 17:00
10-11 18:00
Meetings
F
E
D
C
B
Voice activity
Accel activity
Walks marked
1000
500
0
Temp [°C]
30
25
2.0
workshop
storage
restroom
office
main
kitchen
biolab
bedroom
Light
51,110 14:44:33
51,110 15:57:33
51,110 17:31:42
10
8
6
4
2
0
comfort
distraction
productivity
satisfaction
wellbeing
2
3
4
5
6
7
8
9
10
11
12
13





	centrality			
id	company	authority	talking	walking
A	0.79	0.86	0.63	0.39
B	1.00	1.00	0.60	0.45
C	n/a	n/a	1.00	1.00
D	0.94	0.96	0.63	0.70
E	0.74	0.83	0.57	0.49
F	0.89	0.96	0.76	0.75
			fraction of time	


adjust
give feedback to
astronauts
central server and backups
wear and charge
send data to
sends data to
control
detects and localizes
wearable sensors
smart equipment

Thank you

Please contact us:

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National Science Centre Poland

Ministry of Science and Higher Education
Republic of Poland

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