ICMTD-2019 dataset

Reviewer Guide and Ground Truth
for ChinaVis Data Challenge 2019

Please visit the following URLs to access the ICMTD-2019 dataset (Indoor Crowd Movement Trajectory Dataset 2019) and other information about ChinaVis Data Challenge and the dataset.

http://www.chinavis.org/2019/english/challenge_en.html ;

http://github.com/csuvis/IndoorTrajectoryData/

1. Submission Requirements

Entry submission requirements for ChinaVis Data Challenge 2019 are as follows:

(1) Answer sheet: Contestants are required to answer the questions with appropriate images and descriptions using visual analytics, and the answer sheet should be in Microsoft Word or PDF format;

(2) Video: Contestants are required ensure that there is a video available to explain the whole process of visual analytics. The duration of the video is expected to be within 5 minutes and in WMV format;

(3) Paper: Contestants are required to summarize the characteristics of their visual analysis solution into a paper with no more than 2 pages. The paper should be in Microsoft Word or PDF format and be consistent with the content arrangement required by ChinaVis.

2. Background and Analytical Tasks

China Intelligence Cyber Security Conference is a fictitious academic conference in the field of intelligent cyber security, designed to improve communication between academics, entrepreneurs, and the general publics. The conference, which lasted for three days, with more than 5000 participants. Numerous senior experts were invited to give keynotes and set-up a series of academic activities related to six popular topics, including data security, IoT security, mobile security, privacy protection, smart venue, and smart security technology innovation. The conference also hosted a large business exhibition and a hacking contest, combined with a variety of social activities, such as tea breaks, interviews, lunches, and a banquet.

In order to improve the management of the conference, short-range wireless sensors were used in this conference venue. Each personnel wore a smart badge during the conference to capture their real-time locations in the public areas of the conference venue, with a badge built-in signal transmitter bounded with personal information. The wireless sensors arranged in the venue can receive and record the signals sent from signal transmitters within its coverage in real time. Collected sensor data can be used to monitor the distribution and movements of participants, so that the venue managers were able to provide better conference services and deal with emergencies in time.

The conference organizing committees established a temporary data analysis team to analyze these sensor data for conference management. Assuming you are a member of the analysis team, please design and implement a visual analytics solution of indoor crowd movement trajectories to complete following data analysis tasks assigned by the organizing committees:

Task 1: Please infer the schedule of the main venue and four sub-venues during the conference using data analysis. (It is recommended that contestants answer this question with no more than 800 words and no more than 5 figures)

Task 2: Please analyze the types of participants in the venue during the conference and summarize the movement patterns of each type. (It is recommended that contestants answer this question with no more than 1,000 words and no more than 10 figures)

Task 3: Please find out at least five abnormal events during the conference. (It is recommended that contestants answer this question with no more than 1,000 words and no more than 10 figures)

Task 4: In your opinion, what are the deficiencies in the organization and management of this conference? (It is recommended that contestants answer this question with no more than 500 words and no more than 3 figures)

3. Data Description

Data Challenge 2019 provided contestants with two types of data. One was the conference venue map depicting sensor distributions and functional divisions. The other was sensor log data that records participants' movement trajectories.

3.1 Conference Venue Map

The two-story indoor venue space of the conference is shown in Figure 3.1. The indoor venue space is divided with non-overlapping grids. Each grid is a space unit with an area of 8×8 square meters. The gray grids are not passable. Each of the other grids is equiped with a wireless sensor. A sensor can receive signals emitted by the annunciator in a grid.

On the map offered to contestants, most functional zones were named out but the functions of some zones (room1 to room 6) were hidden. Contestants had to identify the functions of these hidden zones through data analysis. The complete-marked map with all functional zones is shown in Section 4 of this guide.
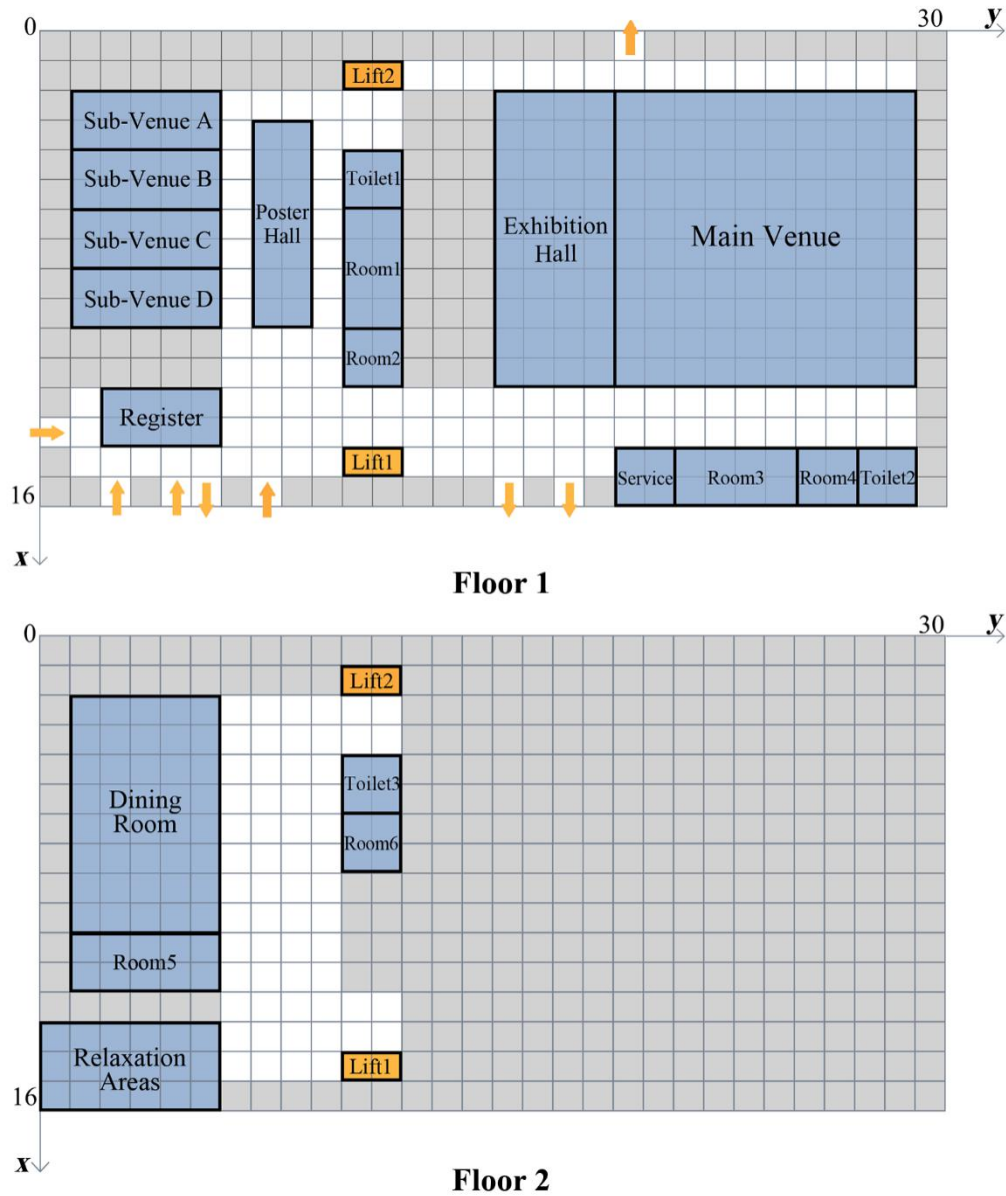
Floor 1

Floor 2

Figure 3.1 Conference venue map

The sensor distribution data records the position of each sensor. It contains 470 data records, each of which includes four data fields. The corresponding meaning of each field is shown in Table 3.1. For example, (012, 1, 4, 3) means that the sensor with ID-012 is located in the fourth grid (from top to bottom) vertically and the third grid horizontally (from left to right) on the first floor of the venue.

Table 3.1 Description of sensor distribution data

Field	Description
SID	Sensor ID
Floor	Sensor floor
X	Sensor abscissa position
Y	Sensor ordinate position

3.2 Sensor Log Data

The sensor log data is provided in a CSV file for three days. To avoid data redundancy, the log data is only reserved for recording when the position of the person changes. The data has 3 fields, a total of 1,879,488 rows about 32MB. The meaning of each field is shown in Table 3.2. For example, "day1: 17647, 012, 32400" means that on the first day of the conference, the person ID-17647 entered the detection range of the sensor ID-012 at the 32400 second (that is, 09:00 am).

Table 3.2 Description of sensor log data

Field	Description
ID	Person ID
SID	Sensor ID
Time	Time with 24-hour system, unit: second. Update from 00:00:00 every day (00 hours 00 minutes 00 seconds)

4. Conference Description

This chapter details the overall background of the conference from four aspects: permission setting for different types of conference personnel, conference venue map, conference schedule, and abnormal events.

4.1 Conference Personnel Types

There are seven types of participants in the conference, as shown in Table 4.1, namely VIP guest, ordinary guest, visitor, media reporter, hacking contestant, staff, and exhibitor. Each type of personnel has different venue permissions and movement patterns.

Table 4.1 Venue Permissions and movement patterns of seven types of conference personnel

Type	Venue Permissions and Basic Movement Patterns
VIP guest	Takes the VIP channel for entry; no need to sign in; usually rests in the VIP lounge; mainly focuses on the activities in the main venue and sub-venues; often sits in the front row of the venue;
Ordinary guest	Sign-in required for entry; mainly moves in the main venue, sub-venues, exhibition halls, and poster areas; independently participates in conference activities based on personal interests;
Visitor	Similar to ordinary guests but not authorized to enter the main venue and unavailable to lunches and dinners provided by the hosts;
Media reporter	Sign-in for entry; rests and works in the media room; often goes to other areas to conduct live broadcasts and interviews;
Hacking contestant	Sign-in for entry; mainly moves in the hacking contest area;
Staff	Enters the venue in advance to be ready for work; distributed throughout the venue, with own fixed working places and scopes of responsibility; often enters and exits the work room and haves lunch in that area;

Exhibitor	Sign-in for entry; mainly moves in the exhibition area

4.2 Conference Venue Map

The conference venue map in Figure 3.1 does not directly indicate all functional zones in the venue. The complete-marked conference venue map is shown in Figure 4.2. Room1, room2, room3, room4, room5, and room6 are tea break area 1, VIP lounge, tea break area 2, media room, hacking contest room, and work room, respectively. Tea break area 1 and 2 are public tea break areas provided by the venue for participants there, and the rest of the rooms are related to the identity of participants. The VIP lounge is offered to VIP-type participants for rest; the media room is for media reporters to work and rest; the hacking contest area is the place where contestants attend the hacking contest; the work room is used by staff in the venue to work and rest. The grid area marked in red is exclusively for VIP guests. That is, only VIP type personnel are authorized to pass, while other types of personnel have no such permission.
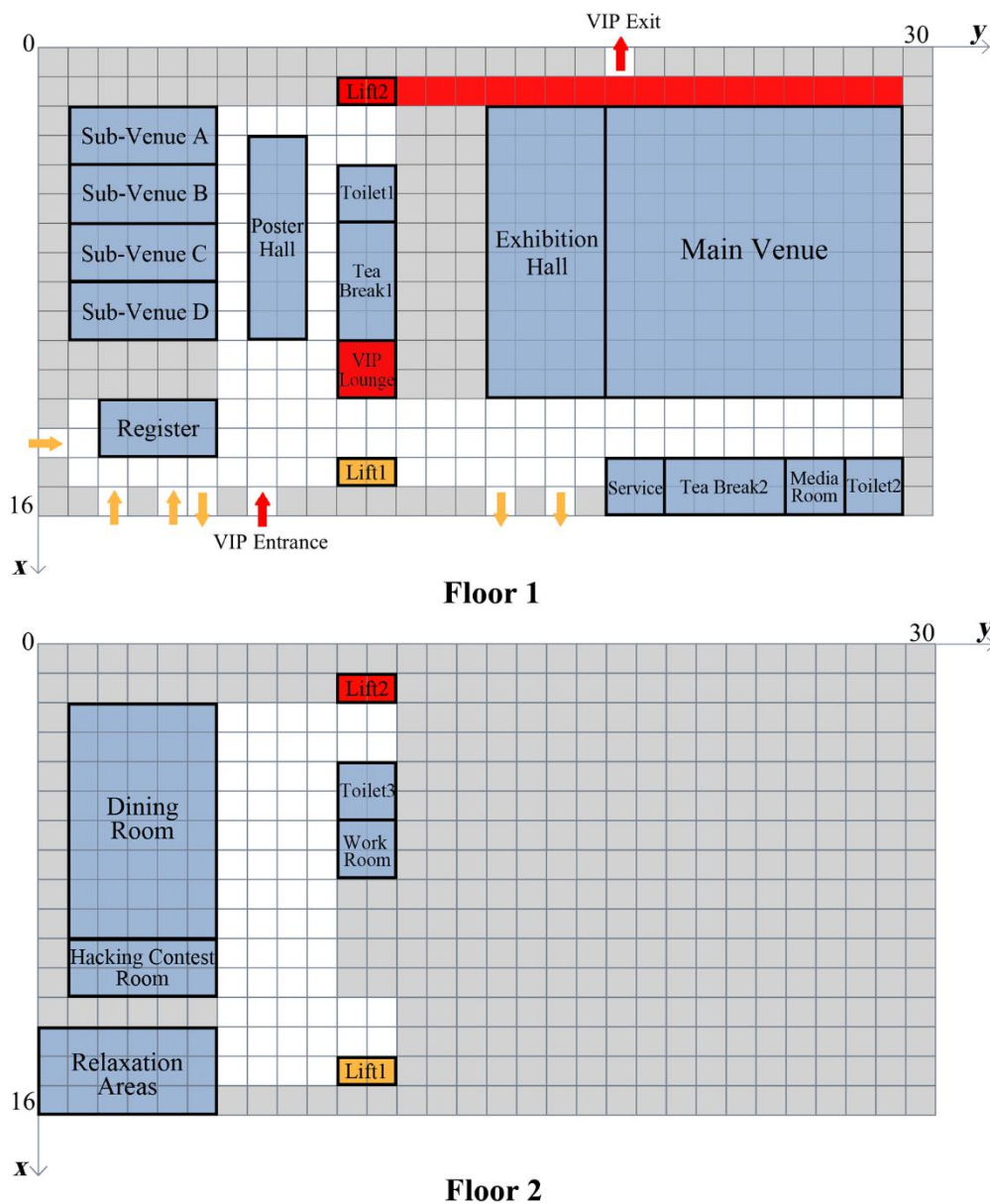

Figure 4.2 Complete marked conference venue map

4.3 Conference Schedule

A total of 5,256 people took part in this conference. There were 3,565 participants attended on the first day, 4,434 on the second day, and 2,930 on the third day. The conference schedule and number of participants for each conference activity are explained as follows.

Schedule at the main venue:

Day 1		
Time	Schedule	Number of Participants
8:30-9:00	Opening Ceremony	1,679
9:00-9:45	Data Security Conference	2,091
9:45-10:30	IoT Security Conference	2,223
10:50-12:20	Mobile Security Panel	2,259
Day 2		
Time	Schedule	Number of Participants
9:00-9:45	Privacy Protection Conference	2,459
9:45-10:30	Smart Venue Conference	2,548
10:50-11:35	Smart Security Technology Innovation Conference	2,519
11:35-12:20	Data Security Conference	2,384
Day 3		
Time	Schedule	Number of Participants
9:00-9:45	IoT Security Conference	1,572
9:45-10:30	Privacy Protection Conference	1,194
10:50-11:35	Smart Security Technology Innovation Panel	928
11:35-12:20	Closing Ceremony	864

Schedule at the sub-venue A:

Day 1		
Time	Schedule	Number of Participants
14:00-15:00	Data Security Sub-forum 1	300
15:15-16:15	Data Security Sub-forum 2	250
16:30-17:30	Data Security Sub-forum 3	272
Day 2		
Time	Schedule	Number of Participants
14:00-15:00	Data Security Sub-forum 4	172

15:15-16:15	Smart Security Technology Innovation Sub-forum 1	481
16:30-17:30	Smart Security Technology Innovation Sub-forum 2	587

Day 3		
Time	Schedule	Number of Participants
9:30-10:30	Featured Activity 3	126
10:30-11:30	Smart Security Technology Innovation Sub-forum 4	871

Schedule at the sub-venue B:

Day 1		
Time	Schedule	Number of Participants
14:00-16:15	IoT Security Sub-forum 1-553	553
16:30-17:30	IoT Security Sub-forum 2	284
Day 2		
Time	Schedule	Number of Participants
14:00-16:15	IoT Security Sub-forum 3	1229
16:30-17:30	Mobile Security Sub-forum 1	349
Day 3		
Time	Schedule	Number of Participants
9:30-11:30	Mobile Security Sub-forum 2	1027

Schedule at the sub-venue C:

Day 1		
Time	Schedule	Number of Participants
14:00-16:15	Privacy Protection Sub-forum 1	605
16:30-17:30	Featured Activity 1	276
Day 2		
Time	Schedule	Number of Participants
14:00-16:15	Privacy Protection Sub-forum 2	522
16:30-17:30	Smart Venue Sub-forum 3	540
Day 3		
Time	Schedule	Number of Participants
9:30-11:30	Featured Activity 4	189

Schedule at the sub-venue D:

Day 1		
Time	Schedule	Number of Participants
14:00-16:15	Smart Venue Sub-forum 1	505
16:30-17:30	Featured Activity 2	467
Day 2		
Time	Schedule	Number of Participants
14:00-16:15	Smart Venue Sub-forum 2	414
16:30-17:30	Smart Security Technology Innovation Sub-forum 3	238

Schedule at the hacking contest area:

Day 1		
Time	Event	Number of Participants
9:00-12:00	Hacking Contest Phase I	172
12:00-13:00	-	
13:00-17:30	Hacking Contest Phase I	
Day 2		
Time	Event	Number of Participants
9:00-12:00	Hacking Contest Phase II	184
12:00-13:00	-	
13:00-17:30	Hacking Contest Phase II	
Day 3		
Time	Event	Number of Participants
9:00-11:30	Hacking Contest Phase III	179

Schedule at the exhibition hall:

Time	Number of People
Day One 8:30-17:30	2669
Day Two 9:00-17:30	3472
Day Three 9:00-12:30	743

Schedule at the poster area:

Time	Number of People
Day One 8:30-17:30	4602

Day Two 9:00-17:30	6562
Day Three 9:00-12:30	3048

Schedule at the dining room:

Time	Number of People
Day One 11:30-14:00	2188
Day Two 11:30-14:00	2487
Day Three 17:30-19:00	356

4.4 Abnormal Events

During the conference, there were 12 abnormal events. The events are outlined in Table 4.2. For detailed description of the events, please refer to Section 5.3.

Table 4.2 Abnormal event summary

Event	Importance	Time of Occurrence	Place	Person	Event Summary
Copy of Name Badge	Important	Day One 9:44:40 - 10:48:24	VIP Lounge	ID:16632	Co-existence of two trajectories with the same person ID
Item Missing	Important	Day Two 12:20 - 14:10	VIP Lounge	ID:11260	Frequent movements between the service and VIP lounge
Equipment Failure	Important	Day Two 13:33:21 - 13:56:15	Exhibition Hall	-	Failure of some sensors with no records
Personnel Ultra Vires	Important	Day One 9:00 - 9:20、 10:30 -10:50	Media Room	ID:11201, 16473	Media reporters exceeding their authority to enter the VIP lounge
Packed Sub-forum (some)	Moderate	Day Two 14:00-16:15 Day Three 9:30-11：30、 10:30-11:30	Sub-venue A, B	-	Packed sub-venues
Venue Congestion	Moderate	10:30-10:50、 15:00-15:15、 16:15-16:30	Main Venue, Sub-venue, Tea Break Area 1 and 2, Toilet1, 2 and 3	-	Overcrowding at the areas of tea break and toilet during the tea break time
Book Signing	Moderate	Day Two 13:00 - 14:30	Exhibition Hall	-	Book signing at the exhibition hall
Group Visit	Moderate	Day One & Two 10:00-11:00、 15:00-16:00	Sign-in Area, Exhibition Hall, Poster Area, Relaxation Areas	Group Visitors	Venue tour by visiting groups
Forgotten Badge	General	Day Two 9:00-17:30	Hacking contest	id:19929	Forgotten badge

			Area		
Early Exit of Hacking Contest Participants	General	Day One, Two, and Three	-	Hacking contest Participants	Hackers leaving the venue in stages
Staff Lateness	General	Day One & Two 10:30-11:30	-	Some Staff	Staff arriving late
Staff Lunch Turns	General	Day One & Two 11:40-12:10、 12:10-12:40	Work Room	Staff	Staff alternately leaving their jobs for lunch

5. Reference Answers

5.1 Analytical Task 1

Please reckon with data analytics the schedule of the main venue and sub-venues during the conference. (It is recommended that contestants answer this question with no more than 800 words and no more than 5 pictures)

This task requires contestants to present the three-day schedule of the main venue and sub-venue A, B, C, and D. The hacking contest room can also be seen as a sub-venue. Contestants only need to turn in a rough venue schedule, as shown in Section 4.3. As for the theme of each sub-venue, it is difficult to be identified by contestants from data analytics.

In addition, this task also expects contestants to give a complete venue map, meaning they should identify the role or function of room1, room2, room3, room4, room5, and room6, as shown in Figure 4.2.

Description of each room is as follows.

- Room1 (tea break area 1): at 15:00-15:15, 16:15-16:30 on the first and the second day, that is, during the intermission of the sub-venue conference, many guests would come to room1, staying there for 3-15 minutes before returning to the sub-venue for the conference.

- Room2 (VIP lounge): During the conference, most of the guests entered the venue from Exit A, B, and C, and left from Exit F and G. A small number of the guests (VIP guests) entered the venue from Exit E and left from Exit H, who, without the need to register at entrance, often entered and left room2, and sit in front seats when attending meetings in the main venue. Moreover, the lift used by VIP guests was different from that of most guests. Therefore, room2 was a VIP lounge for VIP participants.

- Room3 (tea break area 2): at 10:30-10:50 every morning, that is, during conference intermission at the main venue, many guests walked to room3 and stayed there for 3-20 minutes before returning to the main venue.

- Room4 (media room): The conference invited a number of media reporters. Media reporters needed a work space for interviews, copywriting, and other things. In addition, some journalists needed to report on the spot liking live broadcast. Therefore, some reporters spent a long time in the media room, while some came and went to the media room from time to time. Only the movement patterns related to room4 met all these characteristics, so room4 was a media room for media reporters.

- room5 (hacking contest room): The conference hosted a hacking contest. A room was reserved for the hacking contest. Hacking contestants tended to move in a uniform and regular manner,

and often stayed in the hacking contest zone for a long time. Only the movement patterns related to room5 met the above-mentioned characteristics. Therefore, people in room5 were hacking contestants, and room5, the hacking contest area.

- room6 (work room): Some people, who entered the venue very early with no need to register, were often distributed at the venue entrance and exit, register, service and other public areas. Obviously, they were the staff. As they often entered and left room6, it can be inferred that room6 was a work room for the staff.

5.2 Analytical Task 2

Task 2: Please analyze the types of people in the venue during the conference and summarize the movement patterns of each type. (It is recommended that contestants answer this question with no more than 1,000 words and no more than 10 pictures)

Seven types of people in the venue and their movement patterns are shown in Table 5.1.

Table 5.1 Personnel types and movement patterns

Personnel Type	Movement Pattern	Lunch	Dinner	VIP Channel
VIP Guests	•Take the VIP channel • No sign-in for entering the venue • Rest in the VIP lounge • More focused on the conference • Sit in the front row area/VIP seat (area) when attending the conference	√	√	√
Ordinary Guests	• Need to sign in • Main activities are in the main venue, sub-venues, exhibition hall, and poster area • Arrange their activities based on personal interests	√	×	×
(Group) Visitors	• Need to sign in • Cannot enter the main venue • Similar to ordinary guests	×	×	×
Media Reporters	• Need to sign in • Access to the media room. Some media reporters stay in the media room for a long time, and some go to other areas for conference minutes, live broadcasts, and interviews according to work arrangements.	√	√	×
Hacking Contestant	• Sign in • Long-time stay in the hacking contest area, focusing on hacking contest	√	×	×
Staff	• Enter the venue earlier, get in place early • Distributed throughout the venue, with their own fixed working points • Go in and out of the work room, eat lunch and rest there • Take turns for lunch turn, the first group of staff have meals at 11:40-12:10, and the second group at 12:10-12:40.	√	×	×
Exhibitor	• Sign in • Mainly move in the exhibition area • Enter the venue at 17:20-17:40 the next day for dinner banquet	√	√	×

5.3 Analytical Task 3

Task 3: Please find out at least 5 unusual events worthy of attention during the conference. (It is recommended that contestants answer this question with no more than 1,000 words and no more than 10 pictures)

The 12 events in the summary table of abnormal events in Section 4.4 can all be regarded as abnormal events. Here, we explain the 12 abnormal events in detail from event background, character behavior, and data performance.

5.3.1 Copy of name badge

Event background: Personnel A copied the VIP badge of person B (id: 16632) via card copy technology, and entered the venue with the duplicate. Person B attended the conference normally without knowing it. So, when A used the copied badge for entrance, the sensor in the venue will record the information corresponding to the copied badge.

Character behavior: On the first day of the conference, A used the copied badge to enter the venue at 9:44:40, stayed in the VIP lounge for about an hour, looking for an opportunity to commit a crime, and left the venue at 10:48:24 from exit H, suspected of theft. During this period, B participated in the meeting as normal.

Data performance: During 9:44:40-10:48:24, the trajectory with id 16632 jumped between the trajectory of A and that of B.
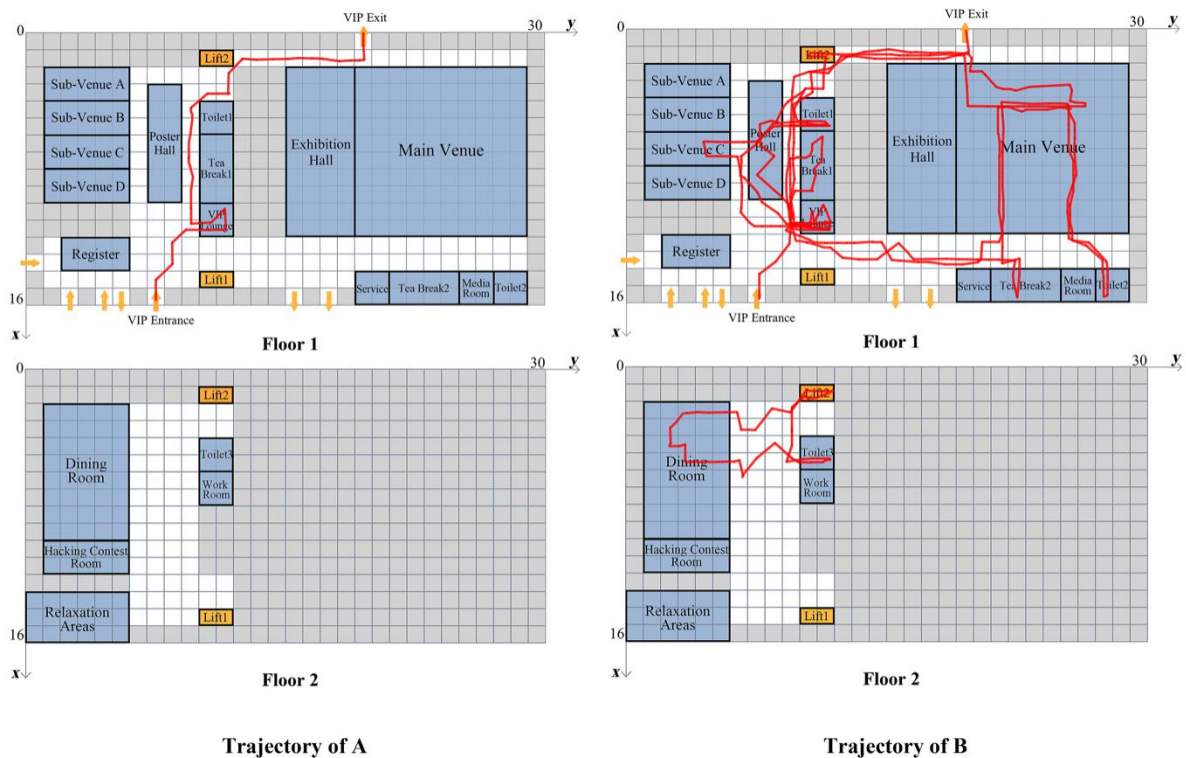
Trajectories of A and B are shown in 5.1.

Figure 5.1 Venue trajectories of A and B

The sensor log data of id: 16632 during this period is shown in Figure 5.2.

#	id	sid	time	#	id	sid	time	#	id	sid	time
1	id	sid	time	33	16632	10424	35608	65	16632	11213	38768
2	16632	10525	35059	34	16632	10423	35628	66	16632	10709	38773
3	16632	11507	35080	35	16632	10422	35646	67	16632	11212	38775
4	16632	10625	35084	36	16632	10421	37819	68	16632	11211	38782
5	16632	11407	35089	37	16632	11011	37819	69	16632	10609	38787
6	16632	11308	35098	38	16632	10521	37839	70	16632	11210	38789
7	16632	11208	35105	39	16632	10621	37864	71	16632	11109	38797
8	16632	10725	35108	40	16632	10721	37888	72	16632	10509	38802
9	16632	11109	35112	41	16632	10821	37919	73	16632	11110	38808
10	16632	11110	35124	42	16632	10921	37946	74	16632	10409	38814
11	16632	10825	35132	43	16632	11021	37982	75	16632	11111	38820
12	16632	11111	35133	44	16632	11121	38029	76	16632	10310	38825
13	16632	10925	35162	45	16632	11221	38060	77	16632	10311	38832
14	16632	11025	35191	46	16632	11321	38087	78	16632	11110	38839
15	16632	11125	35233	47	16632	11322	38102	79	16632	10211	38839
16	16632	11225	35253	48	16632	11422	38126	80	16632	10112	38846
17	16632	11226	35272	49	16632	11522	38169	81	16632	11109	38850
18	16632	11327	35283	50	16632	11422	38589	82	16632	10113	38854
19	16632	11427	35304	51	16632	11322	38640	83	16632	11009	38861
20	16632	11527	35324	52	16632	11321	38675	84	16632	10114	38861
21	16632	11427	35349	53	16632	11320	38698	85	16632	10115	38868
22	16632	11327	35366	54	16632	11319	38710	86	16632	10908	38871
23	16632	11226	35383	55	16632	11110	38719	87	16632	10116	38875
24	16632	11225	35394	56	16632	11318	38723	88	16632	10807	38881
25	16632	11125	35412	57	16632	11109	38730	89	16632	10117	38882
26	16632	11025	35425	58	16632	11317	38737	90	16632	10118	38889
27	16632	10925	35458	59	16632	11009	38740	91	16632	10708	38890
28	16632	10825	35493	60	16632	11316	38746	92	16632	10119	38896
29	16632	10725	35520	61	16632	10909	38751	93	16632	10607	38904
30	16632	10625	35545	62	16632	11315	38753	94	16632	10019	38904
31	16632	10525	35568	63	16632	11214	38761	95			
32	16632	10425	35589	64	16632	10809	38762	96			

Figure 5.2 Sensor log data of id:16632

5.3.2 Lost item

Event background: On the first day of the conference, VIP C (id: 11260), when resting in the VIP lounge after lunch, found that his belongings went missing. Person A in the copy of name badge event used a copy card to enter the venue and walked straight to the VIP lounge for a long-time stay without leaving. However, four minutes after C returned to the VIP lounge at 10:44, A left the venue, so A was suspected of theft.

Character behavior: Around 12:30, C found items missing while resting in the VIP lounge; then C frequently went to the service desk for inquiries. This process lasted about 1 hour and 40 minutes.

Data performance: During 12:20-14:08, C frequently went to the service desk. The trajectory of C on the first floor is shown in Figure 5.3.
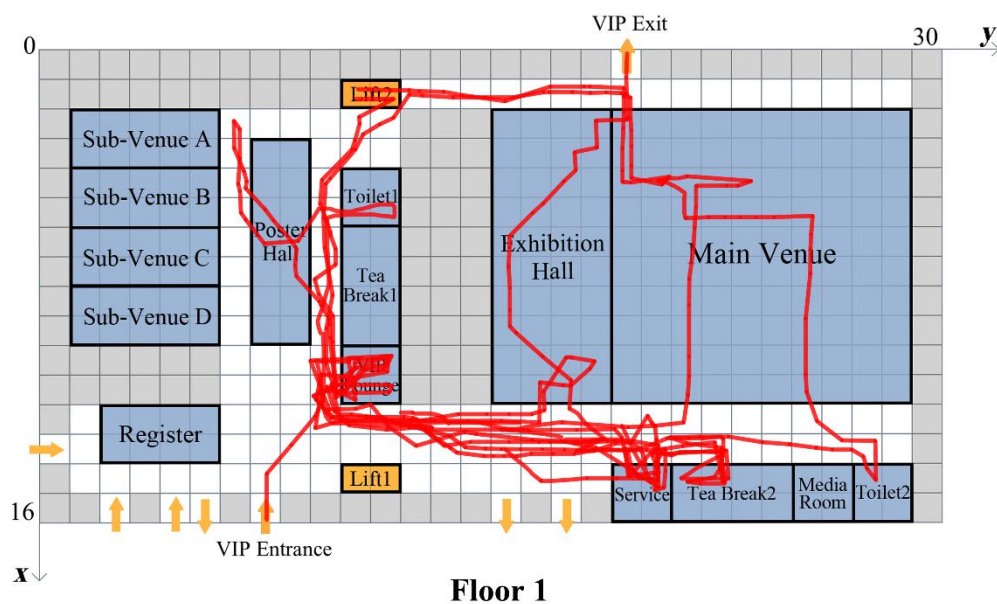

Figure 5.3 Trajectory of C

5.3.3 Equipment failure

Event background: Some sensors equipment at the venue went out of order..

Character behavior: None

Data performance: At 13:33:21-13:56:15 the next day, the sensors log data with the sid of 10715, 10716, 10717, 10718, 10815, 10816, 10817, 10818 were absent. The faulty sensors are shown in the red shaded part of the exhibition hall in Figure 5.4.
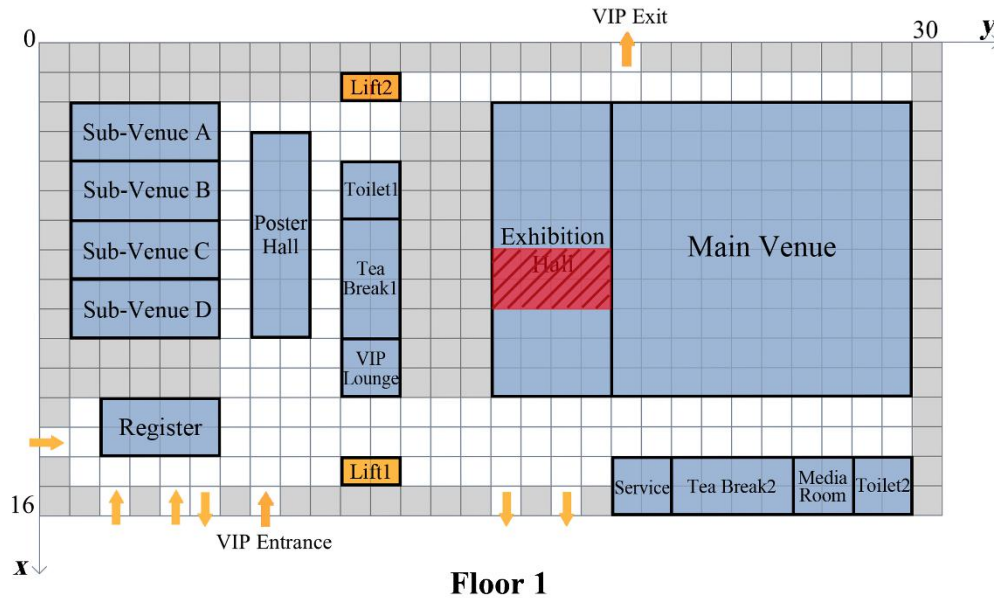

Figure 5.4 Schematic diagram of faulty sensor

5.3.4 Personnel ultra vires

Event background: Only VIPs were authorized to enter the VIP lounge, while only media reporters had permission into the media room.

Character behavior: On the first day of the conference, two reporters went beyond their authority to interview in the VIP lounge. Media reporter D with id 11201 and reporter E with id 16473 entered the VIP lounge for interviews during 9:00-9:20 and 10:30-10:50 respectively; on the second day, VIP F with id: 13344 entered the media room during 12:29:04-12:39:50.

Data performance: D and E entered the VIP lounge, and F entered the media room. The trajectories of D, E, F on the first floor are shown in Figures 5.5, 5.6, and 5.7.
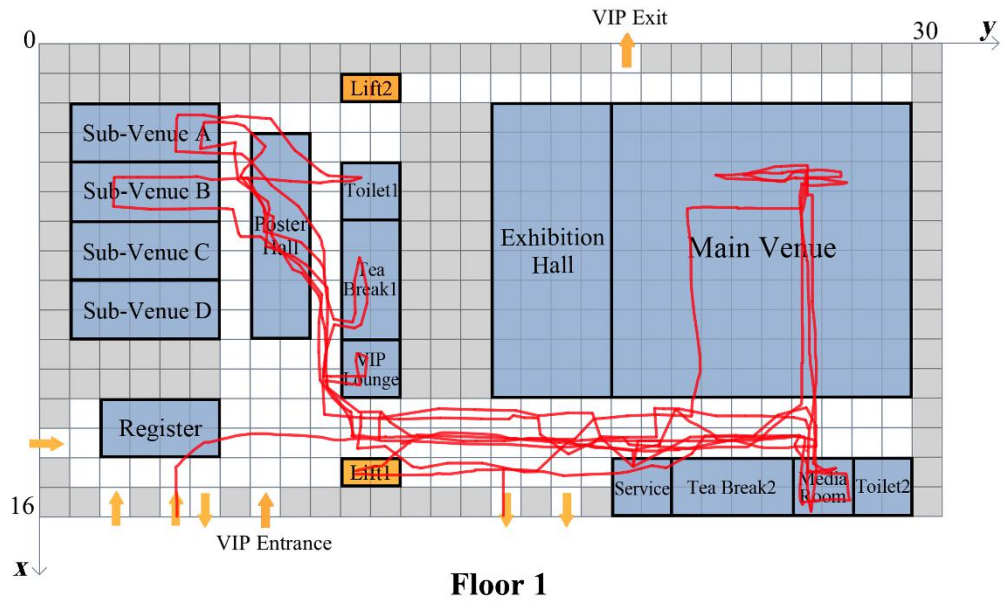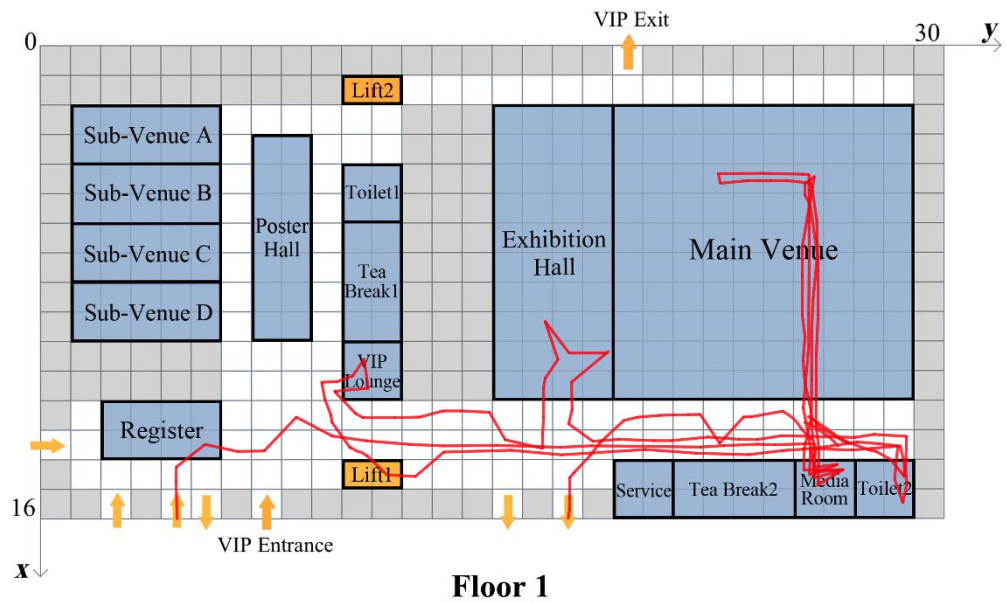
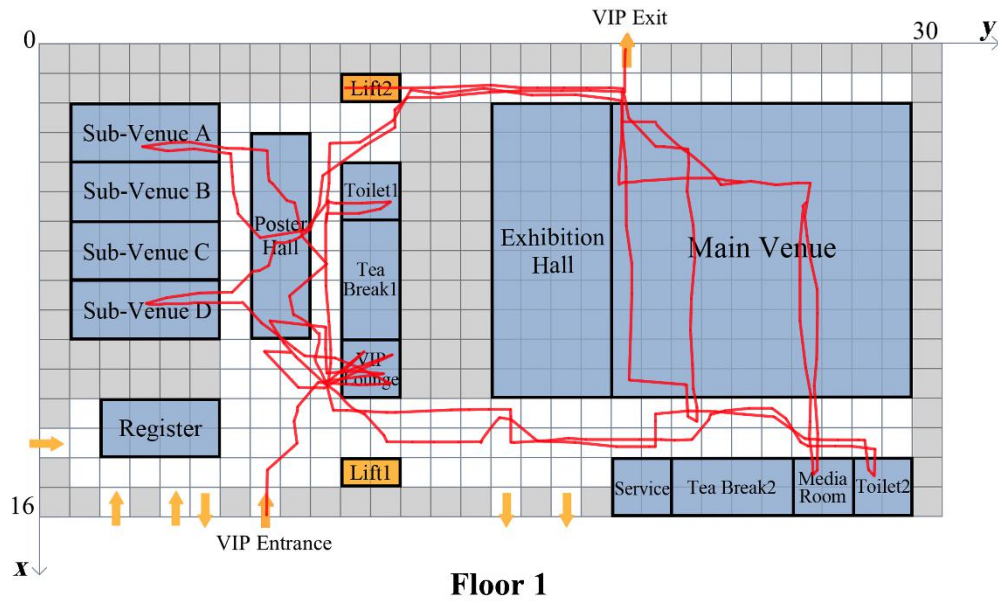Figure 5.5 Trajectory of D

Figure 5.6 Trajectory of E

Figure 5.7 Trajectory of F

5.3.5 Packed sub-forums (some)

Background: During this conference, three sub-venue meetings unexpectedly drew the attention of numerous participants, thus making theses venues overcrowded. They were the IoT security sub-forums held at sub-venue B from 14:00-16:15 pm on the second day, the mobile security sub-forums held at sub-venue B at 9:30-11:30 am on the third day, and the intelligent security technology innovation sub-forum at sub-venue A from 10:30 to 11:30 am on the third days.

Character behavior: a large number of participants entered sub-venue B from 13:50-14:00 in the afternoon of the second day; many entered sub-venue B from 9:20-9:30 in the morning of the second day; From 10:20-11:30 a lot of people entered venue A.

Data performance: At 14:00-16:15 the second day, venue B accommodated a large number of people; on the third day at 9:30-11:30, venue B was packed; on the third day at 10:30-11:30 sub-venue A became overcrowded.

5.3.6 Venue congestion

Background: There were 2 tea break areas in the venue with tea break area 2 available in the morning, and area 1 in the afternoon. Most participants went for a break and to the toilet during the break, yet the quantity and space of such infrastructure facilities as the tea break areas and toilets were limited in the venue, and staff there did not do well to guide everyone in an orderly manner. Therefore, during the conference intermission, it was overcrowded inside the main venue, tea break areas, toilets, and some passages from the venues to the tea break areas.

Character behavior: During the intermission and coffee break at main and sub-venues, a large number of people left the venue for tea break areas, toilets, dining room on the second floor, exits and other areas.

Data performance: During intermission and tea breaks on the first and second day, there was a sudden increase in the sensor log data of the main venue, tea break areas, toilet door, lift, main and sub-venues' door and doorway area; some areas even reached the tolerance limit. The process lasted for 5-20 minutes.

5.3.7 Book signing

Event background: During 13:00-14:30 the next day, book signing was held in the exhibition hall of the venue.

Character behavior: A swarm of people gathered at the signing area around 13:00, lining up for book purchase and signing.

Data performance: The sensor areas with sid of 10215, 10315, and 10415 in the exhibition hall saw a high density of people during this period, and such peak lasted about an hour. The gathering area of people is shown in red in the exhibition hall in Figure 5.8.
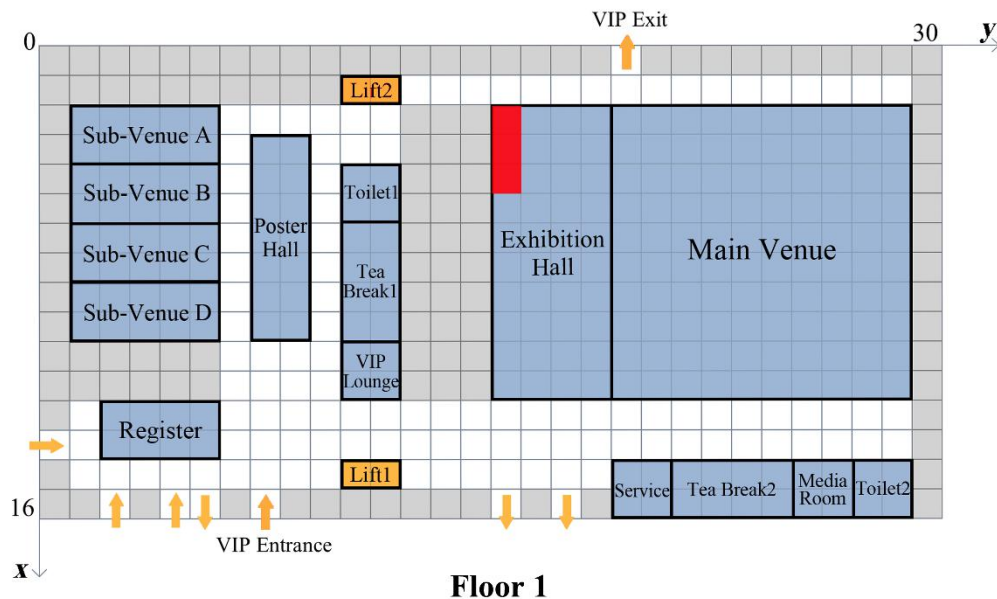

Figure 5.8 Schematic diagram of gathering area

5.3.8 Group visit

Event background: During the conference, a total of four visiting groups toured the venue. Their visiting hours were 10:00-11:00 and 15:00-16:00 on the first day, and 10:00-11:00 and 15:00-16:00 on the second day. The visiting group, of about 100 people each, mainly toured around the exhibition hall and poster hall, with no participation in any academic activity.

Character behavior: Group visitors entered and left the venue at the corresponding time; they visited the venue, and generally acted collectively.

Data performance: During the four periods of visiting hours, the venue took in a group of around 100 people at a time who entered and exited the venue at the same time with similar trajectories there.

5.3.9 Forgotten badge

Event background: VIP G of id: 19929 was an invited guest to the hacking contest, responsible for hosting the second day.

Character behavior: At 9:00 the second day, G came to the podium zone of the hacking contest area, and put the badge on the podium, forgetting to wear it until the end of the contest around 17:30, when it finally occurred to G where the badge was. Then he put on the badge and left the venue.

Data performance: From 9:00-17:30, G stayed at the podium of the contest zone for as long as eight hours.

5.3.10 Early exit of hacking contest participants

Event background: the hacking contest was divided into two parts: basic assessment and additional assessment. Hacking contestants must answer the questions for basic assessment within specified time between 9:00-12:00 on the first day and 9:00-12:00 the second day. Additional assessment was conducted at 13:00-17:30 pm on the first day, 13:00-17:30 pm the second day, and 9:00-11:30 am the third day. The additional assessment adopted a knockout system where hacking contestants who failed would be eliminated without furthering attending the additional assessment of the day.

Character behavior: In the basic assessment, the hacking contestants entered and left the contest area pretty much at the same time, while in the additional assessment, among the contestants who entered at the same time, the eliminated ones would leave early. Hacking contestants on the first and second days left the contest mostly at 15:00, 16:00, and 17:30. On the third day, they leave often at 10:30 and 11:30.

Data performance: The time for the contestants to leave the contest venue was in stages.

5.3.11 Staff lateness

Event background: During the conference, staff entered the venue in advance and arrived at their respective positions before participants entered the venue.

Character behavior: A small number of staff entered the venue at around 10:30-11:30 am. They were the ones that arrived late.

Data performance: On the first day, staff with id of 18347, 10345, 14859 entered the venue at 10:30-11:30 am; on the second day, staff with id of 18059, 12856, 11396, 14678, 10762, 17576 walked into the venue at 10:30-11:30 am.

5.3.12 Staff lunch turns

Event background: All staff in the venue needed provide timely services to all participants. Thus, they followed a rotating lunch system, that is, they were divided into two groups and alternately went to the work room for lunch. Dining time of the first group was 11:40-12:10, and that of the second group was 12:10-12:40.

Character behavior: Some staffs in the venue went to the work room for lunch after leaving their jobs at 11:40, and returned to their original work place before 12:10. The remaining staff went for lunch at 12:10 and returned before 12:40.

Data performance: Some staff left their respective positions for the work room at 11:40, while others left at 12:10.

5.3.13 Other abnormal events

In addition to the aforementioned abnormal events, participants may find out other abnormal events with reasonable explanations.

5.4 Analytical Task 4

Task 4: In your opinion, what are the deficiencies in the organization and management of this conference? (It is recommended that contestants answer this question with no more than 500 words and no more than 3 pictures)

This is an open question. Participants should answer it based on what happened in the venue, with good reasons and sensible explanations.