Method for Collecting and Making Available Contact Information of Event Spectator

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Abstract—**This paper was originally submitted to Xinova as a response to a Request for Invention (RFI) focusing on new Decision and Response Techniques for Security Applications. This paper describes a method of collecting and communicating directly with spectators at an event location.**

In more detail, this describes how to make spectator contact information immediately accessible to security control center personnel, and have it available should agents require direct access for questioning and verification purposes.

I. ABSTRACT

G IVEN the mass of spectators who attend events at arenas, stadiums, and other large-scale venue, one can only begin to understand how difficult it is to maintain a safe and secure environment. Even if security personnel could track individual spectators and groups during entire events over several hours or even days, being able to find and, if necessary, communicate with persons of interest in real time are daunting tasks and nearly impossible to do adequately. At such venues, people tend to move around constantly, leave their seats to purchase food/snacks, take restroom breaks, go to meet friends, etc. Being away from an assigned seat for too long, however, may raise suspicion.

Security ground personnel can be dispatched to locate and communicate with such "individuals of interest", however, this can be extremely resource intensive. Similarly, cameras can be strategically placed to cover major foot traffic areas and large seating sections, but this rarely allows for quick access to people or to get feedback on items that raise suspicion.

Some newer venues have broadband or other wireless services that may be able to track and/or access spectator devices. Some of these methods require the downloading of venue-specific applications, and thus may be ineffective if phones are turned off, or if patrons refuse to download the needed app.

There needs to be a way for security personnel, whether in the control/command center, or on patrol, to contact individuals for possible questioning, verification, or other reasons. It would be beneficial to be able to call them, direct a message to them, ask them to comply with regulations, and/or otherwise determine why they are away from their seat, etc., in a simple manner.

This solution discloses a method that will allow the security control center to reach out to spectators at a venue in real time.

II. SUMMARY OF THE INVENTION

This solution discloses attaching machine readable code (such as a QR code or other code) to an event ticket. Spectator/purchaser/attendee associated information is embedded (preferably at the time of purchase) or otherwise associated with the event ticket. This can be a mobile phone number along with date/section/row/seat number. It may also include a picture to be added at the time of purchase or time of venue entry (or both). Upon entering a venue, the QR or other code is scanned, and a verification SNS message is sent to the mobile phone on record. That mobile phone number is then placed into a database, along with the section/row/seat number/picture, which is then readily accessible by the command center for the duration of the event (or longer).

Tracking this information can allow the command center to determine which seats should be occupied and which should be empty. Video cameras can scan seat sections looking for vacancies and be linked to the seat occupancy data to determine discrepancies. A seat that should be occupied but isn't for a certain amount of time raises a red flag. Exit records (again possibly through exit gates) can be checked to see if the spectator has left early (e.g. to avoid exit traffic, etc.) or is still on the grounds. Command center could also utilize the information to call or send information directly to the spectator for any number of reasons.

In addition, video cameras can facially recognize who is in/should be in a particular seat by confirming with a picture obtained at the time of ticket purchase, time of entry, or both. Access to spectator mobile phone number and/or text message information will also be valuable to communicate with spectators for other reasons.

III. DETAILED EXPLANATION

Ticket for venue events, including music concerts, theaters, and sporting events are typically purchased through one of several methods. These can include online transactions, ticket centers, and venue box offices. Tickets can also be purchased singly, in pairs, in groups, and bulk. Of course, some tickets are resold (obtained through scalpers). Regardless of the method or number of tickets purchased, QR or other codes (see Fig 1) or identifying data are embedded with personalized data, preferably at the time of purchase/acquisition, such as a mobile phone number, as part of the unique ticket number or associated database entry. Usually the associated mobile phone number will be that of an event attendee, but could possibly be that of a relative, group leader, bulk ticket agent, season ticket holder, and the like.

When a ticket is purchased, identifiable information is associated with the QR or other code. In addition to a mobile phone number of the spectator/attendee/purchaser, other data such as date/section/row/seat number are included either in the code or to the database entry. A photograph may also be acquired, either at the time of purchase, OR captured when the attendee enters the venue gate itself (or both). All of this is recorded and associated with the QR code. Technology to add information to an associated QR code is already available, such as:
http://www.quickbase.com/quickbase-blog/embedding-qrcode-barcodes-in-quickbase
Upon entering a venue, the ticket number / code is scanned, and a verification SNS message is sent to the mobile phone on record, indicating the ticket has been used at the event. The associated mobile phone number, along with the section/row/seat number, and possibly photograph of attendee is provided to or is accessible by the command center for the duration of the event (or longer).

Occupied vs Unoccupied Seat
Using already existing still or video cameras, coupled with entry/exit records, allow the command center system to ascertain which seats should be occupied and which should be empty. Video cameras can scan seats for their status, and seats that should be occupied but are vacant

for a certain amount of time raise a red flag. Exit records (again possibly through exit gates) can be checked to see if the spectator has left early (e.g. to avoid exit traffic, etc.) or is still on the grounds.

Example: Scenario A
Security system indicates that the ticket for a particular seat was not verified at entry. The seat should be empty, but is not. Patrolling guards can be dispatched to determine who is occupying the seat.

Fig. 1. Control center may wish to question this person since the seat is supposed to be empty

Example: Scenario B
Security cameras show that a particular seat that had been occupied has now been vacant for an unnatural amount of time. The command center or patrol personnel can call the mobile phone or issue a standard text message to the mobile phone number on record and ask for their location/status. If combined with existing facial tracking systems, a spectator's image to their seat assignment can be tracked throughout the venue. If the image shows up on a video camera located at the entrance of a bathroom far away, instead of one closer to the seat, the command center can contact the person and ask for a reason.

Fig. 2. Seats that were occupied but now empty for an unnaturally duration.

Again, security personnel can call the mobile phone on record/view the spectator's picture, match with entry/exit camera footage and log, send a text message to the attendee to verify location or obtain comment.

Incident in the Stands

If/when an incident occurs in the stands, or if the command center requires the attention of a spectator in a seat, they can use the phone number associated with that ticket to make contact. To initiate contact from the command center, a seat number can be entered into the system to display the data registered for that seat, from which the system can dial the mobile phone automatically, and/or send a text message to the mobile phone (e.g. When will you return to your seat? Please stop throwing things). Alternatively, a patrolling guard can be contacted with the information so as to visit the section and speak with the spectator directly.

If a spectator's mobile phone is unreachable, or if the purchaser of the ticket is not the one attending the event, the command center can use the photograph of the attendee that was added upon entry to the venue for verification.

Example: Scenario C

An argument breaks out in a seating section, where video cameras or other tracking method detect some type of disturbance. The command center can identify the person(s), and contact them via mobile phone, send a text message indicating they are on notice, or dispatch security personnel to the scene. If the suspicious individuals are unreachable via mobile phone, it is likely that spectators in adjacent seats (same section/row), whether friends of the suspicious individuals or not, can be reached in the same way for comment, additional information, description (e.g. who started to the brawl, what happened, was there any injury, identifying marks, etc.)

Fig. 3. Control center may see a fight starting and wish to ask spectators in the area details of the incident.

There are instances where the phone number associated with the QR code is not the number of the attendee (due to scalped tickets, bulk ticket sales, etc.). However, it may be a relative, a friend, or someone who knows the ticket user, and may be a good starting point when trying to identify the attendee. Furthermore, there will be enough people, who do provide the right number, in the vicinity of the suspicious person.

Solutions expressed here are most effective at venues where there is assigned seating. This could include sporting arenas, music halls, movie theatres, and can even be extended to airlines or trains.

Lockers place at such venues could also require a scan of a QR code for opening/setting the combination. This way, the seat number and mobile phone/picture of attendee can be associated with a locker number. Unlike lockers at, say, Universal Studios that require a fingerprint AND 4-digit number to enroll / set access the locker, a QR code with embedded mobile phone / picture can be utilized instead.

This information is vastly more useful for security or locker room attendants who need quick access to such data to track down the owner.

IV. CONCLUSION

By using collected information, and providing it to the control center, the proposed system:

- Provides better and direct access to spectator(s) in real-time
- Does not require downloading of a special app for downloading onto spectator phones
- Allows mobile phones to remain switched on a the venue
- Can keep "suspect" occupied and on the phone until agent support arrives.