reviewed paper

The Egyptian Revolution from the Perspective of an Urban Planner: Demonstrations on the Streets of Alexandria, Egypt

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1 ABSTRACT

Urban design is mainly about connecting people and places, movement and urban form, nature and the built fabric. Hence, one of the aims of urban design should always be that humans lie in the focal point of the design and not only technical infrastructure or buildings. Egyptian public spaces play an important role to activate demonstrators socially and even politically, inspiring the whole world. Public squares were and still are playing a valuable role in political changes all through the country.

Urban spaces have different impacts on humans' feelings and perception. Those feelings are affected directly and indirectly through urban settings, human masses or crowds, topography, distance, weather, etc. This leads to the need of developing new methods to measure the feelings of people in urban spaces. "SMART-Bands" are ambulatory assessment devices that measure how people feel in their city and how they react to the surrounding built and non-built environments. These devices can measure body parameters in real-time, like skin temperature, skin conductance and heart rate, as indicators for human emotions.

This paper presents a human urban experience on one of the protesting events in Alexandria using "SMART-Bands" as a tool for collecting protestors' feelings. The case study covers one of the major arteries of the city, with its variations of width, topography, and street furniture. It documents the whole experience of two different participants walking within the crowds, and living the whole experience with changing weather conditions, crowd density, and street settings.

This experimental research is considered as a pilot stage for similar in-depth studies that could lead to a new way of thinking about urban planning and public participation.

2 INTRODUCTION

For a long time in Egypt, younger generations were often perceived to be arrogant or spoiled when expressing their ideas. Being unaccepted from the elderly forced them to seek shelter in the virtual world for articulating themselves (Youssef, C. 2011). However, starting from 2008 groups of youngsters (such as 6 April Movement) started to switch from the virtual to the real world, and started going on strikes and demonstrations opposing the old regime. The call for January 25th demonstrations were first initiated by those groups, and then followed by the rest of the population (Shabab 6 April, 2012).

When masses of young Egyptians flowed into the streets during the revolution days in Cairo, Alexandria, and allover Egypt, it has been learned that the "virtual streets" for demonstrating that were percolating on various social media web sites were not entirely separated from actual, physical ones. Hence, public streets began to be the most motivated arteries in Egypt (Figure 1). At that time the unprecedented scene of streets and squares packed with people became an urban brand for Egypt and an icon for liberty and freedom for both Egyptians and Non-Egyptians.

Figure 1: El Tahrir Square, Cairo (BBC, 2011), El Corniche Boulevard & Port Said Street, Alexandria (author)

Public open spaces can take the responsibility as key design elements for enhancing urban life quality and to reduce the negative effects of urbanisation. For that sake, open spaces must meet the expectations of

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potential users and offer the suitable mix of environmental, economic, social, and even political conditions (Bruse, 2007; Raslan, Bakr, & Ayad, 2011).

Designing public spaces, which are accepted and used by pedestrians, is a challenging task for urban planners as it deals with a multitude of different disciplines. There are several factors that directly and indirectly affect the pedestrians' behaviour in public open spaces, such as the right mix of sun and shade, the presence of windy and calm areas, spaces and streets conditions, topography, multitude of different materials used in the urban fabric and the arrangement of buildings, trees, and other urban objects besides the surroundings situation and crowd characteristics.

3 OBJECTIVES

Conventionally, urban planners depend on data gathered by professionals to aid them through their different design and decision making processes. Even when they tend to interview the different stakeholders, the process is deliberate, and tends to neglect intangible parameters that stakeholders find difficult to spell out. Hence, it is of great importance to make use of state-of-the-art technologies to effectively and efficiently collect feelings sensed by users of those urban spaces.

The presented research investigates the use of "SMART-Bands" as a newly developed tool to collect demonstrators' feelings while parading one of the major arteries of the city of Alexandria. If the tested tool and technique proves to be useful, it can easily be implemented on many study areas to facilitate the tasks of urban decision makers for collecting users' attitudes towards urban spaces.

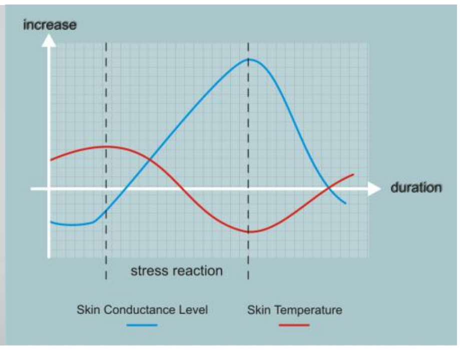
4 METHODOLOGY

This research is a pilot study to test how useful "SMART-Bands" can be for urban decision makers. Although the sample size is not representative, however, such a research pinpoints potentials and limitations for upcoming, more elaborate studies using the same tool.

4.1 Emotion measurement with physiological vital data

Emotions can be observed in many different ways. In the research at hand a new technical device, the sensor wrist-band called SMART-Band (Figure 2), is used to measure changing body physiology as a consequence of the actual feelings and emotions of the participants. Based on previous research in the new field of Affective Sciences (NFS Affective Sciences, 2011) and classical emotion research, emotional reactions are reflected in changes in the activity of the autonomic nervous system. As a result of this activity, specific physiological parameters (e.g. skin conductance and skin temperature) show different values depending on the actual emotion (Kreibig, 2010). These parameters are classified as vital data of the individual. In this context, the so-called method of the psychophysiological monitoring implies the recording of objective vital data in real-time and for every instant. With the help of this data unswayed affective emotions are derived. For the measurement of the participants' feelings during the Egyptian demonstrations, the identifying of mental load (stress) with the help of physiological indicators is obvious. Stress can be understood as a product of anger and fear, both considered as highly negative emotions (Bergner et al. 2011). In this explicit situation the actual surroundings, the pressure of the crowd or the imminent danger of conflicts arising can elicit stress reactions.

A negative emotion is given, when the skin conductibility increases and shortly afterwards, the skin temperature drops (Bergner et al. 2011). The following graphical curves illustrate this process (Figure 3). The slope values of the curves can be used for statistical analysis. The mathematical function of these parameters and their curves is simplified with the first derivation. The method of using scoring points (increase in skin conductibility = Scoring +1; decrease in skin temperature = -1) was previously used in several studies (Bergner et al. 2011).

Figures 2 and 3: The SMART-Band (own source) and Physiological Stress Reaction (Bergner et al. 2011)

Due to recording the data for every second during the study, it can be coupled and synchronized with GPS- and video camera data without difficulty. This offers new perspectives to understand the participants' feelings and emotions in the context of their actual surroundings. This approach was already pursued in several project studies. First test series were done in the emomap-project (Zeile, 2010). Furthermore, the so-called EmBaGIS (Emotional Barrier-GIS)-studies were conducted in the context of urban spatial barriers for handicapped (Bergner et al., 2011). Only recently studies concerning the correlation of stress and noise load and also emotional sensing of urban green areas were carried out (Bergner et al. 2012). In all these studies, the SMART-Band (SMART-BAND by www.bodymonitor.de), developed by GESIS, the Leibnitz-Institute for Social Science in Mannheim/Germany (Papastefanou 2009), was used.

4.2 The selected path

While demonstrations in Cairo take place in El Tahrir-Square and neighbouring streets as an agglomoration space, in Alexandria the situation is different. Rather than staying in one place, demonstrators prefer walking in parades, circulation Alexandria's streets (Figure 4). During the first 18 days of the Egyptian Revolution, demonstrators marched from both east and west sides of the city (blue nodes) towards the small square across Sidi Gaber train station in the centre of Alexandria (green node). Another path, but less frequently used, was from Quaed Ibrahim Mosque towards Ras El Tin Palace (one of the Presidential Palaces in Alexandria) located further to the west edge of the city.

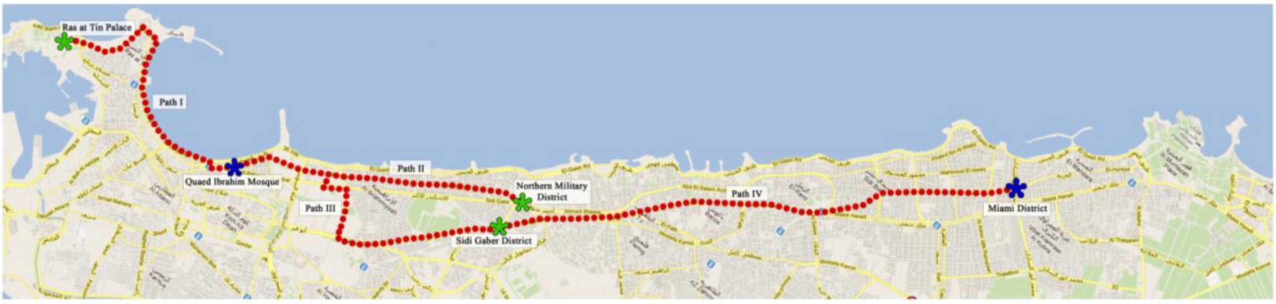


Figure 4: Map of Alexandria Showing the Different Paths Demonstrators Took During 2011/2012

However, after Hosni Mubarak stepped down, demonstrators switched their destination towards the Northern Military District, since their dispute switched from being directed to the former ruler of Egypt (i.e. Hosni Mubarak) towards the current one: the Supreme Council of Armed Forces (SCAF), which is represented by the Northern Military District. Hence, demonstrators switched to the path studied by this research, a 4.34 Km strip stretching from El Quaed Ibrahim Mosque in El-Ramleh Station and ending by the Northern Military District in Sidi Gaber District. For research reasons, this path was sub-divided into ten sections (Table 1 & Figure 5) according to major intersections and presence of squares along the path.

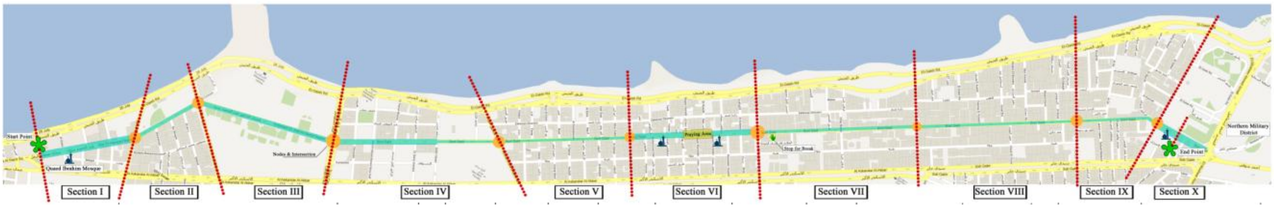


Figure 5: The Study Area Divided in Sub-Sections

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	From	To	Length (m)
Section I	El Quaed Ibrahim Mosque	Champollion Str.	380
Section II	Champollion Str.	Ali Mustafa Mosharafa Str.	277
Section III	Ali Mustafa Mosharafa Str.	Suez Canal Str.	520
Section IV	Suez Canal Str.	Mohamed Shafeek Ghorbal Str.	617
Section V	Mohamed Shafeek Ghorbal Str.	Ismail El Fangary Str.	485
Section VI	Ismail El Fangary Str.	Abbas El Halwany Str.	480
Section VII	Abbas El Halwany Str.	El Delta Str.	600
Section VIII	El Delta Str.	Medhat Seif El Yazal Str.	590
Section IX	Medhat Seif El Yazal Str.	Abdel Latif El Soufani Str.	295
Section X	Abdel Latif El Soufani Str.	El Zananiry Str.	100

Table 1: Street Sections and their Lengths

4.3 The event description

Similar to previous calls for demonstrations that take place on Fridays, this experiment took place on Friday, 18th of November 2011. It was another call for a million-participants-demonstration, where Moslem Brothers and Salafis were joining as well. Demonstrators agglomerated after noon prayers at the place across El Quaed Ibrahim Mosque and started their march around 1:15 pm towards the Northern Military District. The march lasted for almost three hours, with one pause made during that period for after-noon prayers. The weather was pleasant at the start of the march, but it started to drizzle after 2.5 hours, and to pour in the last 20 minutes. Two female participants took place in this experiment. They were equipped with one video camera and one GPS tracker for them, as well as one SMART-Band for each. Only one video camera was used, although two were available due to the long duration of the march and the fear that the capacity of one video camera might not cover the whole duration.

5 FINDINGS AND ANALYSIS

	From	To	Length (m)
Section I	El Quaed Ibrahim Mosque	Champollion Str.	380
Section II	Champollion Str.	Ali Mustafa Mosharafa Str.	277
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Table 2: Average Pedestrian’s Speed & Stress Response Count and Values per Street Section

Generally, participant A showed a higher amount of stress responses than participant B. Although the minimum and the average values of stress responses of both participants are pretty close, participant A again showed a higher maximum response during most of the demonstration path, except at the start and while approaching the destination. This can be due to different reasons; if the test person knows that she is approaching the destination, this can reduce the stress. Another reason might be that the test person got used to the situation and stopped showing high stress responses; or that the situation was not as stressful itself as in the middle of the path. Since there was only one test conducted during that research, one cannot determine which of those reasons caused the relaxed stress levels.

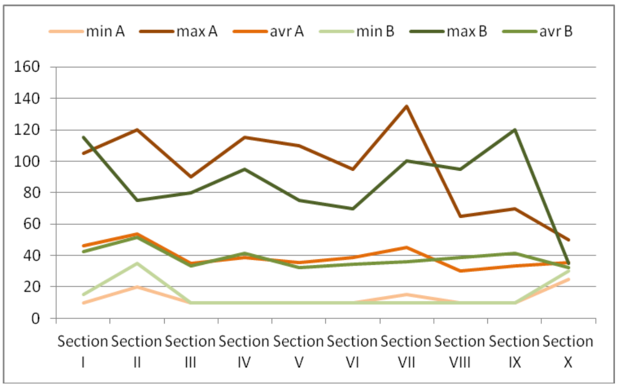

Figure 6: Min, Max, and Average Stress Values

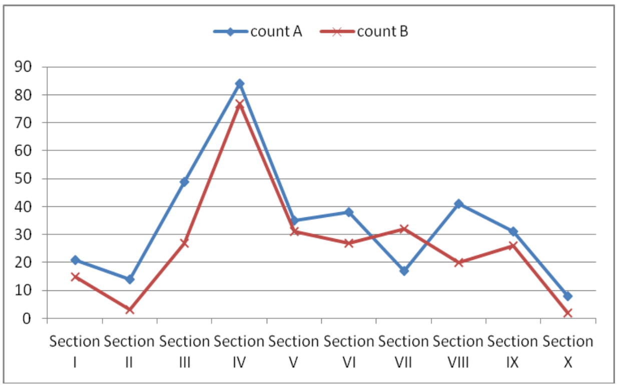

Figure 7: Amount of Stress Points within Each Street Section

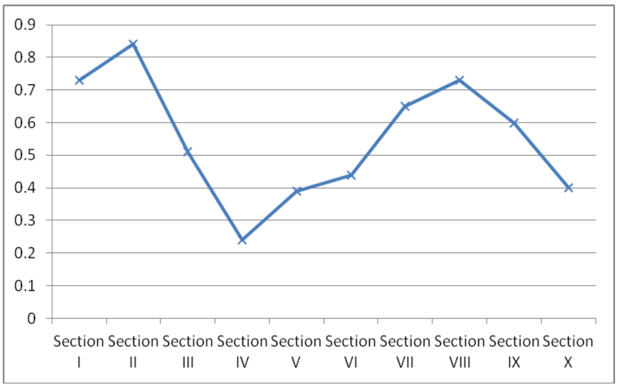

Figure 8: Average Pedestrian's Speed for Each Street Section

By comparing the amounts of stress points (Figure 7) with the pedestrians' average speed (Figure 8) within each street section, it is noticeable that generally whenever the amount of stress points rises, the slower the pedestrians' speed gets. For example, street section IV has the highest amount of stress reactions for both participants: 84 and 77; it also has the slowest speed: 0.24 m/s (Table 2). From reviewing the video data for this street section, it was noticed that during the 42 minutes needed to pass this 617m section, the density of the crowd got higher. This was due to the street profile getting narrower than the preceding section (Figure 10), as well as due to the parked cars on at least one side of the street. Hence, the demonstrators were slowed down, and sometimes even completely blocked, which caused the stress charted in street section IV.

If we neglect the first two street sections, where demonstrators were still fewer in number and still physically fitter, section IV showed the highest amount of stress reactions, while sections VII and IX showed the highest values of stress response (Figure 6). As clear from Figure 8, sections VII, VIII, and IX also represent the highest pedestrian speed: 0.65, 0.70, and 0.60 m/s respectively (Table 2). During this phase, the weather had changed dramatically and it was raining. This caused several things: first, many of demonstrators left due to the bad weather and the streets started to get less crowded; second, the remaining demonstrators had better chances to walk faster because of the less crowded street and also to get away from the rain, as well as people usually getting a boost of power while approaching their destination.

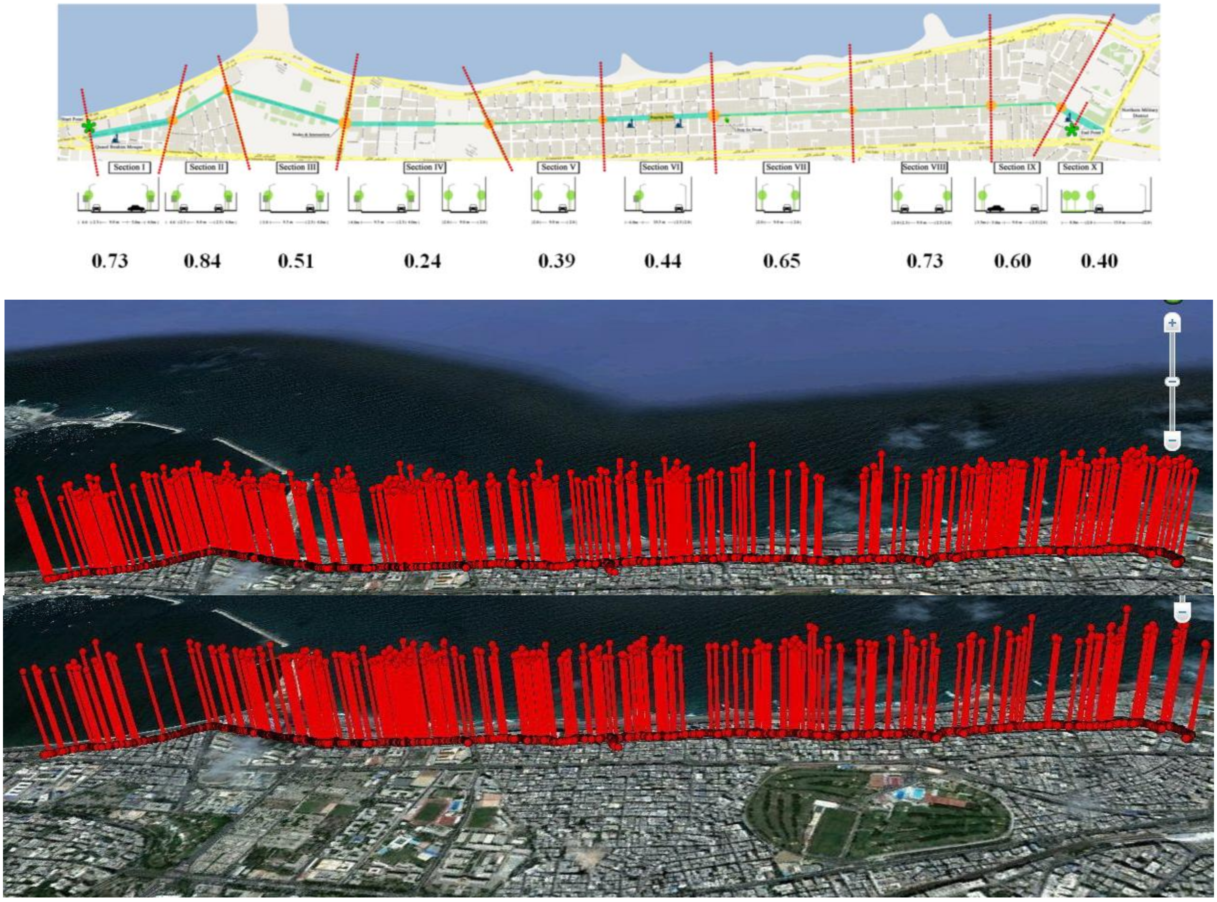

Figure 9: Street Profiles and Pedestrians' Speed at the Different 10 Street Sections along with Stress Profiles for Participants A & B

It was also clear that the pedestrian's average speed was proportional to the width of the path. The narrower the street the slower pedestrians got and vice versa (Figure 9). The only exception is in street section VI. Although the Street was 13m wide, with sidewalks of 6 and 2 meters width, the average speed was only 0.44 m/s. This is due to the time the demonstrators came to a complete stop for after-noon prayers, which drastically increased the amount of time for crossing this 480m stretch of path.

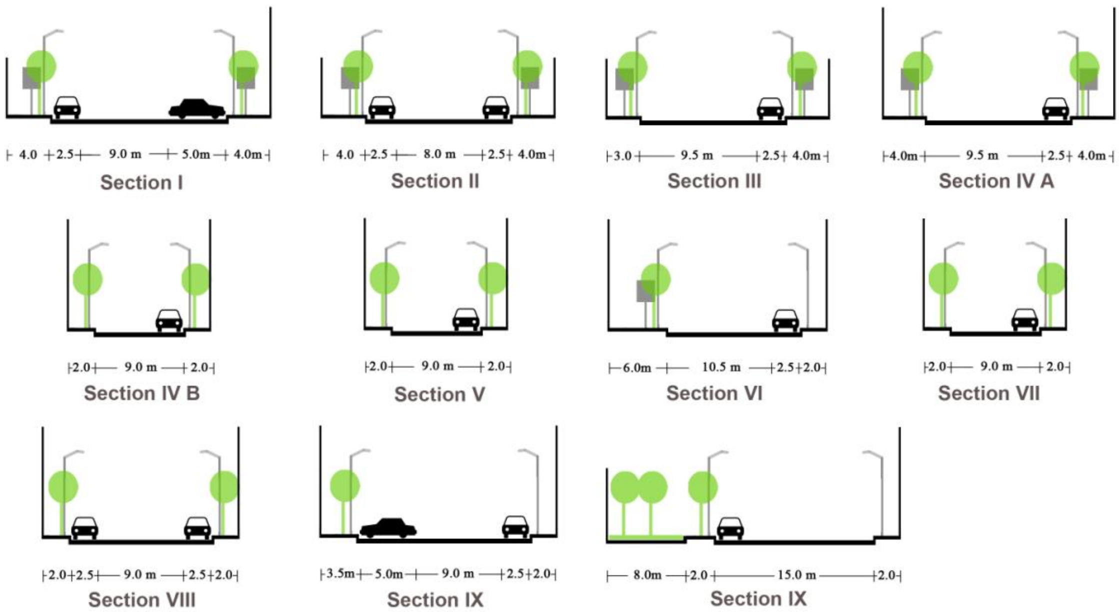

Figure 10: Detailed Street Profiles at the Different 10 Sections

Obstacles faced on the path also triggered stress responses. Such obstacles can be water patches on the streets due to bad pavements, clusters of garbage partially or completely blocking the sidewalks, shops trespassing on sidewalks and hence reducing the usable part for pedestrians, as well as bad or missing pavements of sidewalks (Figure 11).

Figure 11: Different Obstacles that Trigger Stress Responses along the Path (author)

Just before major street intersections as well as right after squares, there were always high valued and high intensity stress responses charted (Figures 12 and 13). Both situations triggered stress reactions due to the increased intensity of crowds at those points. In the first case, cars crossing the intersections blocked the path of the demonstrators, forced pedestrians at the front to a stop and therefore blocked the rest of the march. In the second case, streets get almost triple in width at squares, so pedestrians spread out over the whole square, and then they had to squeeze again to fit into the regular street width, if not moreover blocked by any trashcans, street vendors, or parked cars.

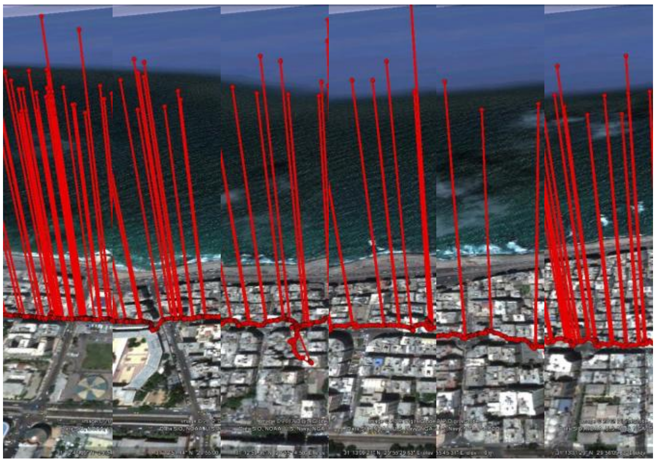

Figure 12: Stress Responses for Pedestrian A at Street Intersections and Squares

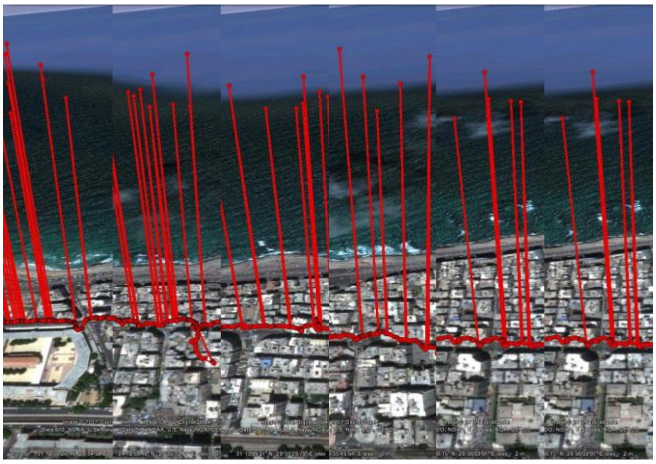

Figure 13: Stress Responses for Pedestrian B at Street Intersections and Squares

6 CONCLUSION

Unlike Cairo with its El-Tahrir Square, Alexandria lacks an open space of a proper size and a central location. Hence Alexandrians tended to marching demonstrations rather than agglomerating ones. The walk itself, along with the street conditions and people densities had their effects on demonstrators.

The personal space is defined as an invisible bubble that surrounds an individual, and serves to maintain proper spacing between individuals. The size of this bubble varies according to different cultural, social, personality, and environmental dimensions (Hall, 1966). Stress values rose proportionally with the density of surrounding demonstrators. These rates rose higher, when the surrounding crowd was basically of the opposite sex due to the conservative culture still dominating in the region. Other reasons for triggering stress responses were the various types of obstacles blocking the path, the bad weather condition by the end of the path, as well as getting enthusiastic and cheering along with the rest of the demonstrators.

Because this experiment was limited in its number of testing subjects and testing locations, no definite results can be reported from it in a final manner, but it still provides useful knowledge about the usefulness of "SMART-Bands". It was adjudged that these devices are easy to handle, to wear comfortably during outdoor use, and provide useful information concerning how people perceive and react towards their built and non-built environments.

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