SIMULATION OF PEDESTRIAN BEHAVIOUR IN URBAN SPACES,
A Case Study Of "Skil Gaber" Public Space, Alexandria, Egypt

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The meaning of urban spaces cannot be limited only to the built environment which includes buildings, streets, plazas, trees and platforms, but also extends to people activities that play the important role in urban design. (Cowan, R.et al 2006; Ellison, 2004).

Good urban design is not only about how places look, but actually it is the art of making places for people.
In urban spaces people are the **decision makers**, and they are free to choose their next steps. Where spaces are supposed to be designed to meet pedestrians’ **needs** and support their activities, most of our urban spaces are not giving pedestrian movements the enough **priority** and that cause a **mis-use** problem.

This research explores the **link** between **urban space design** and **pedestrian needs**, using a manual observation technique and a **computer simulation model**, in order to assess existing situation and future design proposals for pedestrian movement in one of Alexandria open spaces.
The research adopts a **partially automated technique**. A **manual part** consists of direct observations, photographs and videos to analyze the existing situation. While, an **automated part** uses a pedestrian simulator software, “**SIMWALK**”, that generates several alternative scenarios based on possible urban interventions. The program is based on a simplified version of the Social Force Model with the Agent Based Model.

**Modeling Elements**

1- **Agents**
2- **Space**
3- **Behaviour**

- **The position is within the field boundaries.**
- **No obstacles or walls are blocking the new step.**
- **No obstacles or walls are within the pedestrians' radius.**
- **No other pedestrians are standing within a range of twice the pedestrians' radius.**

The case study area (**simulated area**) is located in **Sidi Gaber** Railway Station, Alexandria, Egypt, which is considered an undefined transitional public space with less of enclosure. It has several paths and nodes.
Pedestrians usually cross the road from extremely critical areas that are in conflict with vehicle lanes. In order to eliminate such behaviors, the local authority constructed a pedestrian bridge and escalator that transfers the pedestrian crossing to an elevated level.
From the field observations on the selected space there are a number of pedestrian paths that have been noticed as pedestrian movement destinations. Within these paths, pedestrians need to cross “Al-Horreyah Avenue” in order to arrive to their targets.
4- Real Situation

**Before** Before using the pedestrian bridge

**After** After using the pedestrian bridge as a new movement facility.
The simulation process starts with determining **points**, according to the ‘SimWalk’ vocabularies, that have been applied through manual observations. These points have been analyzed and recognized depending on **pedestrians’ paths** that have been observed.
### Agents Builder

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<th>Exit</th>
<th>Time</th>
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<th>Veh</th>
<th>Ped</th>
<th>Video</th>
<th>Road</th>
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</table>

**Dialog:**

- **First step:** Start area
- **Start time range:** 60
- **Next step:** Walking area
- **Waiting time:** 5
- **Last step:** Exit area
- **Agents walking speed:** 1.5

**Options:**

- Add
- Delete
- Update
- Build
Simulation Behaviour

Through the simulation of the existing situation, it has been observed that the pedestrians could hardly transfer into the upper level of the pedestrian bridge using the escalators.

That might be because of the existing location of the bridge that does not fit on the pedestrians’ destinations direction, although it has been tried to attract agents to change their level through waiting area located on the upper level and has been put in their path through the agents’ builder.
Pedestrian Behaviour Approach

Sidi-Gaber Station

a

b
As a trial, it has been tried to change the bridge location and re-asses the sidewalks' barriers to give pedestrians more chances for using the bridge virtually, through the SimWalk software, that could be more possible to be used by agents through their movement.
The result was that the agents really used the bridge with its' new location, and this could be as a proposal scenario for such space.
Conclusion

While working through this research it has been reached out that most of urban spaces have **successful designs**, but lack the **suitable use** from pedestrians.

Here, the results are **partially expected** in advance and fill the gap between urban design and space users to help in solving the **mis-use problem** and make spaces more effective.
THANK YOU

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