Crowd dynamics simulation - a multi-agent system based on CA (extended model)

Preparation:

- Please use your own work from **Lab5**
- Extend the code to meet the requirements of the assignment.

Possible further improvements

- Improve calculation method for static floor field.
- Add repulsion force between pedestrians and walls (add it by modification of static floor field close to the walls).
- Random order of pedestrian's movement.
- Define more than one exit (source) of the static field, and implement the pedestrian decision process of choosing the exit.
- Add new layer to the simulation with the smoke. Define the source of the smoke (e.g., fire), implement the diffusion and decay of the smoke. Add some interaction between the pedestrian and the smoke (e.g., if smoke is dense enough, the pedestrian moves slower or changes the direction of the movement)
- Add obstacles to the map, and implement the direction-finding algorithm (is the static potential field will be enough? Justify!)
- Add the group behavior. Define the group with some arbitrary number of pedestrians. Define the group leader and implement the new movement algorithm (others group members will follow the leader). The leader may change the exit.
- **... your own idea** (requires instructor approval, improvement cannot be trivial)**.**

Assessment

- Please choose 4 improvements from list above (excluding **... your idea)** to earn **5 points**.
- If you choose to implement your own idea, then to earn **5 points** please choose only 2 improvement from list above.
- Please also provide a brief technical description in PDF format for an additional **2 points**.

Due to date

Please submit your work electronically on the UPeL platform before the next class, i.e. before April 25th. A demonstration and explanation of the solutions used in the implementation will take place at the next class.