

Flash Mob Like Crowd Motion Control (Extended Abstract)

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This paper presents an approach for a motion control in a group. We use cellular automaton for this control and present situation where it could be shown. For our purpose we have chosen Flash Mob situation, which is phenomenon of the 21st century [Duran, 2006]. Definition of a Flash Mob according to the MacmillanDictionary is *to suddenly gather in a public place, do something for a short time, and quickly go away again*. Slightly different definition could be also applied.

We refer to the Flash Mob situation where group of informed people suddenly gather in the public space and start to move evenly. Rest of the group starts to move same way after some time. Movement of an individual depend on the surrounding people. Principles of social networking include behavior of an individual affected by the group and this principle is also used in Flash mob situation.

For the automatic definition of a group animation we use cellular automaton as a system that has various uses [Wolfram, 2002]. It could be successfully used for the group behavior control in emergency situations [Wang et al., 2010]. Our solution is same in the meaning of group control, but different, because we not define only behavior but also motion itself. In Flash Mob situation, motion and behavior are highly connected, because behavior of the group defines how individuals move.

Moreover we need to create database of the motions and define them manually. Afterwards we could join different motions to create one longer. Smooth motion is left to the future work. By now, motions need to start and end in the same pose so there are no jumps in the spatial properties of the motion, but still could be in the temporal.

To use cellular automaton as a control for the group we associated cells of an automaton to the individuals in a way that state of the cell is mapped to the motion. Position of an individual in the space does not need to

be same as in the automaton, but spatial relationship of the cells and position in the 3d space need to be same. If this condition is not satisfied relationships are omitted and whole behavior and motion will not be Flash Mob-like.

At first there are some seeds - cells that are occupied by the informed person, that will move alike. Other cells has some random state - this means that these individuals move with another motion. In this state not only stated to the cells are set, but also orientation to the individuals is set. Informed cells are oriented in the same direction, to create uniform motion.

In each other stage we calculate number of informed cells in Moore's neighborhood (8-neighborhood) that are in the Field Of View (this depend on the orientation). If there is one informed than in the next step cell is changed to the informed. If there are enough informed cells, after some time whole group will be informed. The exact number that is needed for the believable behavior is left for the further discussion as is the lowest number needed for the control that will lead to only informed cells.

In conclusion we presented idea of group motion control for the flash mob situation. There are still problems left for the further discussion. These problems include better rules and possible implementation problems.

References

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