

15-869 References for April 22, 2014 – Crowds

We started by talking about a few papers that used data-driven techniques to generate the behavior of individuals in crowds. The first two used a straightforward strategy of looking up the next action for each actor from the database. From these papers, interactions between characters did occur, however, they occurred somewhat spontaneously, due to the local context of the character.

Lee, Kang Hoon, Myung Geol Choi, Qyoun Hong, and Jehee Lee. "**Group behavior from video: a data-driven approach to crowd simulation.**" In *Proceedings of the 2007 ACM SIGGRAPH/Eurographics symposium on Computer animation*, pp. 109-118. Eurographics Association, 2007.

http://mrl.snu.ac.kr/research/ProjectVideoCrowd/group_behavior.html

Lerner, Alon, Yiorgos Chrysanthou, and Dani Lischinski. "**Crowds by example.**" In *Computer Graphics Forum*, vol. 26, no. 3, pp. 655-664. Blackwell Publishing Ltd, 2007.

<https://www.youtube.com/watch?v=obe5uO56cTI>

<https://graphics.cs.ucy.ac.cy/research/downloads/crowd-data>

The next paper also used data, but viewed that data in terms of local formations that the character would try to maintain in terms of its neighbors. In this view, the character's neighbors were important to it, in the sense that the formation was prespecified. The paper focused on how to edit these formations, morphing from one to another and painting them onto a scene.

Ju, Eunjung, Myung Geol Choi, Minji Park, Jehee Lee, Kang Hoon Lee, and Shigeo Takahashi. "**Morphable crowds.**" In *ACM Transactions on Graphics (TOG)*, vol. 29, no. 6, p. 140. ACM, 2010.

<http://mrl.snu.ac.kr/research/ProjectMorphableCrowds/MorphableCrowds.html>

The next two papers took a look at how people actually walk together in small groups, recognizing common formations and proposing techniques that help actors to maintain such formations in more and less crowded scenarios.

Peters, Christopher, and Cathy Ennis. "**Modeling groups of plausible virtual pedestrians.**" *IEEE Computer Graphics and Applications* 29, no. 4 (2009): 54-63.

<http://nestor2.coventry.ac.uk/~cpeters/research.html>

Moussaïd, Mehdi, Niriaska Perozo, Simon Garnier, Dirk Helbing, and Guy Theraulaz. "**The walking behaviour of pedestrian social groups and its impact on crowd dynamics.**" *PloS one* 5, no. 4 (2010): e10047.

<http://www.mehdimoussaïd.com/archives/58>

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0010047#pone-0010047-g006>

Finally, we focused on the following recent paper, which uses a technique of searching over feasible velocities and feasible formations for pedestrian groups, in order to find the optimal one that allows the group to stay together. One interesting aspect of this paper is that it offers a number of ways in which to evaluate the results of simulations that attempt to maintain pedestrian groups.

Karamouzas, Ioannis, and Mark Overmars. "**Simulating and evaluating the local behavior of small pedestrian groups.**" Visualization and Computer Graphics, IEEE Transactions on 18, no. 3 (2012): 394-406. <https://sites.google.com/site/ikaramouzas/groups>